INSTRUCTION PROGRAM REVIEW: SPRING 2013 SUBMISSION CYCLE

Program Name: Geological Sciences
Faculty Contact: Linda Hand

Academic Year: 2011-2012
Program Review Submission Date: March 22, 2013

I. 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 planning documents 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, iclicker questions, peer learning, computerized games, paleontology playing cards, role-playing, team competitions, prizes and field trips.

II. Summary of Student and Program Data

A. *Student Learning Outcomes Assessment*

Summarize recent SLO assessments, identify trends, and discuss areas in need of improvement.

Two SLOs for PALN 111 were assessed for the first time (the course has only been offered twice). All of the students could successfully interpret graphical representations of numerical data (speed versus stride), but only 75% could apply stratigraphic principles to create paleogeographic reconstructions (a much more abstract concept requiring spatial visualization skills). Additional visual aids linking specific lithologies to tectonic environments were recommended.

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.

   Geology student success rates (65.8%) dropped below the college and division rates this year, while retention rates were above the college and division rates. Demographic variables were similar to those of the college with respect to highest and lowest success rates by ethnicity and gender, but 4 of the categories had very low enrollments (0-6). The demographics based on age differed most from those of the college due to geology's small enrollments (1-5) in most age categories.

   Paleontology student success rates (84%) and retention rates (90.1%) were well above the college and division rates this year. Demographic variables fluctuate wildly from year to year due to paleontology's small enrollments (0-7) in most ethnicity and age categories. In 4 of the 5

demographic categories with over 30 enrollments, the success rates exceed those of the college and division, the exception being the 20-24 year olds (61.9%).

Oceanography student success rates (59.8%) dropped below the college and division rates this year, while retention rates (83%) were well above the college and division rates this year. Demographic variables fluctuate wildly from year to year due to oceanography's small enrollments (0-5) in most ethnicity and age categories. In the 3 demographic categories with over 30 enrollments, the success rates are below those of the college but closely straddled those of the division.

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.).

Geology LOAD has declined to 805.7 after increasing the 3 prior years, in part due to the offering of a second section of geology lecture that generally enrolls fewer students than the first section. The frequency and time of the second section are being adjusted to try to increase enrollments in the second section.

Paleontology LOAD has declined to 550. It appears that as the proportion of lecture to lab sections decreases, so does the LOAD due to the smaller class size of the lab. Paln 110 usually fills the earliest of all the classes in all 3 departments and generates the largest waitlist. This popularity is believed to be due to the abundance of hands-on learning experiences in the course.

Oceanography LOAD has decreased to 1140. The number of sections has stabilized at one section per semester, ending the rapid increase in LOAD that had occurred over the last few years as the number of sections decreased.

The 2011-12 LOAD numbers for all 3 programs are well above the LOAD averages for the Math/Science Division (527) and the college (531.7) as well as the State's productivity target (525).

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

Full-time FTEF in geology is reported as 1.2, although it should be 1.12 and the adjunct FTEF should be 0.09 for hours in the ISC in the fall. Adjunct hours in the ISC have been discontinued.

Full-time FTEF in paleontology has varied between 0.4 and 0.76 over the last 3 years as we continue to adjust the number of 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 lab is a major requirement for the AS and AS-T degrees, we would like to offer it at least once a year. There is no adjunct FTEF.

Full-time FTEF in oceanography is 0.4. Adjunct FTEF is 0.2 in the summer as OCEN 100 is regularly offered, but current plans to increases the summer offerings (and adjunct FTEF) to include OCEN 101 are underway.

D. 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
Paln 111	Linda Hand	January 2013
Geol 100	Linda Hand	January 2013
Paln 110	Linda Hand	March 2013

E. Website Review

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

Faculty contact(s)	Date of next review/update
Linda Hand	July 2013
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III. Student Learning Outcomes Scheduling and Alignment

A. *Course SLO Assessment*

Explain any recent or projected modifications to the course SLO assessment process or schedule.

As the only full-time faculty in all 3 departments is responsible for all of the administrative duties, the SLO assessment schedule will be modified to avoid overtaxing the faculty.

B. Program SLO Assessment

Explain any recent or projected modifications to the program SLO assessment process or schedule.

As the only full-time faculty in all 3 departments is responsible for all of the administrative duties, the SLO assessment schedule will be modified to avoid overtaxing the faculty.

C. SLO Alignment

Discuss how Course SLOs support Program SLOs. Discuss how Course and/or Program SLOs support Institutional/GE SLOs. Refer to TracDat related Program and Institutional SLO reports.

Since geology, oceanography and paleontology each have only one lecture course, the program SLOs are the Course SLOs. These SLOs support Institutional/GE SLOs 1, 2 and 3.

IV. 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.

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 by 21 percent from 2010 to 2020, faster than the average for all occupations. Most new jobs will be in management, scientific, and technical consulting services. This growth in employment opportunities is expected to produce a small but steady increase in the number of geology majors.

V. Institutional Planning

A. *Results of Plans and Actions*

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

The implementation of iclicker use in the classroom did increase student engagement and the vast majority of students reported favorably about their use and perceived benefits. As hoped, the students did engage in more peer discussion as they worked to answer questions and more "thinking-out-loud" commentaries of problem solving processes were modeled by the instructor based on polling results. Whether or not this translates into greater student success remains to be seen and has not been assessed objectively. Iclickers were discontinued in PALN 110 as the greater amount of hands-on exercises and peer discussion in the course keeps the students engaged and makes the additional cost of the iclickers less justifiable than in the larger classes.

B. *Program Vision*

What is the program's vision for sustaining and improving student learning and success during the *next six years*? Make connections to the College Mission and Diversity Statements, Institutional Priorities, 2008-2013, and other institutional planning documents as appropriate. Address trends in the SLO assessment results and student success indicators and data noted in Section II. Summary of Student and Program Data.

[*Note*: 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 Sections II.F.1 and II.F.2.]

[*Note*: Specific plans to be implemented in the *next year* should be entered in Section V.C.]

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

- completing the remaining requirements for the AS-T degree including performing the necessary course outline updates and submissions to the C-ID to improve transfer success
- modifying some SLOs
- assessing the SLOs to improve student success
- removing TBAs from all courses
- improving lecture delivery, sample collections, iclicker applications, webaccess materials and in-class lecture and lab exercises to promote academic excellence and increase student engagement
- updating laptop computer to ensure compatibility with Firefox for using WebAccess

1. To guide future faculty and staff development initiatives, describe the professional enrichment 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.

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.

3. To guide the Institutional Planning Committee (IPC) in long-range planning, discuss any major changes in resource needs anticipated in the *next six years*. Examples: faculty retirements, equipment obsolescence, space allocation. Leave sections blank if no major changes are anticipated. Specific resource requests for the next academic year should be itemized in Section VI.A below.

   Faculty: 4T

   Equipment and Technology: An updated MacBook Pro will eventually be necessary as some of the updates in Firefox, the best web browser for WebAccess, do not work properly with older computers and operating systems.

   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 from eBay.

   Classified Staff: 4T

   Facilities: 4T

C. 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.

Plan 1

Title:

AS-T

Description

Complete additional steps for establishment of AS-T degree in geology

Action(s)	Completion Date	Measurable Outcome(s)
Update Paln 111 and Geol 100 course outlines	Spring 2013	Approval by COI
Submit to C-ID for approval	Fall 2013	COR approval, conditions or denial
Make necessary changes based on feedback from C-ID review of COR and resubmit	Fall 2013 or Spring 2014	COR approval

Plan 2

Title:

SLOs

Description

Modify SLOs as necessary and assess 2 SLOs

Action(s)	Completion Date	Measurable Outcome(s)
Modify PALN 111 SLOs in COR	Spring 2013	Approval of course outline SLOs
Modify GEOL 100 SLOs in COR	Spring 2013	Approval of course outline SLOs
Modify PALN 111 SLOs in tracdat	Fall 2013	New SLOs in tracdat
Modify GEOL 100 SLOs in tracdat	Fall 2013	New SLOs in tracdat
Assess 2 OCEN 100 SLOs & enter data into tracdat	Fall 2013	2 Assessments and recommendations entered in tracdat

Plan 3

Title:

TBAs

Description

Remove TBAs from PALN 110

Action(s)	Completion Date	Measurable Outcome(s)
Update PALN 110 Course Oultine	Spring 2013	Approval of course outline
Modify PALN 110 description in the next Schedule of Classes & Catalog	Next round of edits	Modified description in next editions of the Schedule of Classes & Catalog

Plan 4

Title:

Samples and Supplies

Description

Purchase additional samples, videos and consumables to use in lecture and lab classes

Action(s)	Completion Date	Measurable Outcome(s)
Locate and purchase any samples, videos or consumables on current shopping list	ongoing	Purchased samples and/or supplies

Plan 5

Title:

Technology update

Description

Purchase a new MacBook Pro to replace an older model. Recent updates to Firefox are not fully compatible with my current MacBook Pro OS.

Action(s)	Completion Date	Measurable Outcome(s)
Purchase a new MacBook Pro to replace an older model	unknown	New laptop that works better with Firefox

[Note: Itemize in Section VI.A. Any additional resources required to implement plans.]

VI. Resource Requests

A. Itemized Resource Requests

List the resources needed for ongoing program operation and to implement the plans listed above.

Faculty

Full-time faculty requests (identify specialty if applicable)	Number of positions
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Complete Full-Time Faculty Position Request Form for each position.

Description of reassigned or hourly time for prioritized plans	Plan #(s)	Cost

Equipment and Technology

Description (for ongoing program operation)	Cost
Updating an obsolete MacBook Pro will be necessary every 3-6 years as technologies improve and hardware & software compatibility issues arise.	

Description (for prioritized plans)	Plan #(s)	Cost
An updated MacBook Pro will eventually be necessary as some of the updates in Firefox, the best web browser for WebAccess, do not work properly with older computers and operating systems.	5	$2100

Instructional Materials

Description (for ongoing program operation)	Cost
Samples of minerals, rocks and fossils	$120-300
Videos	$60-120
Consumables (polishing & cutting supplies, fossil adhesives, colored pencils, batteries, etc.)	$100-200

Description (for prioritized plans)	Plan #(s)	Cost
Samples of minerals, rocks and fossils	4	$120-300
Videos	4	$60-120
Consumables (polishing & cutting supplies, fossil adhesives, colored pencils, batteries, etc.)	4	$100-200

Classified Staff

Description (for ongoing program operation)	Cost

Description (for prioritized plans)	Plan #(s)	Cost

Facilities

For immediate or routine facilities requests, submit a CSM Facility Project Request Form.

Description (for prioritized plans)	Plan #(s)	Cost

B. Cost for Prioritized Plans

Use the resources costs from Section VI.A. above to provide the total cost for each plan.

Plan #	Plan Title	Total Cost
1-3	AS-T, SLOs, TBAs	$0
4	Samples and Supplies	$280-620
5	Technology update	$2100