

PROGRAM REVIEW UPDATE 2015-2016

Program: Chemistry

Division: STEMPS

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Audience: Deans, Vice Presidents of Student Services and Academic Services, All Planning and Allocation Committees. This document will be available to the public.

Purpose: To document significant program accomplishments, plans and needs between Triennial Program Reviews. This update should provide a snapshot of your program.

Time Frame: This update should reflect on program status during the 2014-15 academic year. It should describe plans starting now and continuing through 2016-17.

Topics: The first section of this Program Review Update focuses on general program reflection and planning. The second and third sections focus on reflection and planning regarding Student Learning Outcomes.

Scope: While this Program Review Update does ask for some analysis of data, detailed data reports in the form of appendices should be reserved for the Triennial Program Review.

Instructions:

- 1) Please fill in the following information as completely as possible.
- 2) If the requested information does not apply to your program, please write "No Changes Since the Program Planning Update."
- 3) Send an electronic copy of this form to the Program Review Committee Chair and your Dean by _____.

Part One: Program Snapshot

A. Have there been any significant changes to your program, your program's data or your program's needs since the previous Program Planning Update?

If there are any changes, describe the relevant information and its significance in the space below.

These changes might have originated from within the program or because of an external source (the institution or the state, for example). Possible sources of relevant information might include, but are not limited to, the following:

- Data generated by your program
- Data from the Office of Institutional Research
- CEMC Data
- Retirements
- State Mandates
- Labor Market Data

1) The total number of sections offered by the program in the academic year 2014 – 2015 (fall, spring, and summer) has been the highest since 2002 at 35 sections. It is projected to increase to 38 sections for the academic year 2015 – 2016 if we offer the same number of sections for Spring 2016 as we did in the Spring of 2015. This means that more students can complete their chemistry course requirements in a timely manner. This would not have been possible without the addition of a third chemistry lab.

Impact on Program Needs:

- The Chemistry supply budget needs augmentation to support additional courses and

instrumentation.

- Additional lockers are needed in 1802 to accommodate increased number of sections for the General College Chemistry majors courses 1A and 1B.
- This impacts the workload of the lab support staff.
- It would be helpful for the Program to hire a fourth full-time faculty.

2) We expect increasing use of the new GC – MS instrument this coming year for the Organic Chemistry classes. The full-time faculty members and a biology faculty participated in 2 days of applications training in the summer. In addition, a new polarimeter has been added to the suite of instrumentation that chemistry students are exposed to in their various classes.

Impact on Program Needs:

- These new instruments require maintenance and supplies that will impact both the chemistry budget and the workload of support staff.

B. What objectives, initiatives, or plans from the 2014 Program Planning Update (PPU) have been achieved and how?

Our total FTEF allocation went from 14.35 FTEF in 2014 – 2105 to 15.63 FTEF in 2015 – 2016.

Faculty is completing training on using the GC – MS so we expect increasing use of it for the Organic Chemistry classes starting in Fall 2015.

We have received the new digital polarimeter, replaced old centrifuges and balances, and acquired supplemental equipment for the new GC-MS instrument.

Many of our faculty continue to implement the use of online homework systems and smartbooks in their classes.

The lab manuals for the Chemistry 30A, 30B, and 31 have been converted to editable electronic files and have gone through a first phase of revision (this objective was from an older program review).

All of our course outlines have undergone review and have been approved by the Curriculum Committee. We decided not to change the prerequisite for Chemistry 30B as we found that, although it is essential and highly recommended, it is no longer a prerequisite for the CSU Nursing Programs. In addition, physiology has added chemistry 1A and 31 as alternative prerequisites which will likely reduce the number of waiver requests.

C. What obstacles has your program faced in achieving objectives, initiatives, or plans?

When we ordered the GC-MS, we opted for the least costly package. As a result, it took longer to fully implement the instrument as we found out during training that we needed additional components to optimize the instrument in its current environment. This has been solved by additional IER funds but it is something to keep in mind for the next time we purchase major instrumentation.

With the tentative changes in the faculty contract, we anticipate full participation of part-time faculty in the SLO process. This has been a challenge in the past but, in the future, this should help the

Program collect and assess dramatically more data for a better analysis.

We have been unable to collect consistent, statistically valid assessment data due to changes in rubric scales and rubric scores. We have been correcting these and have had discussions on how best to integrate the scoring process for our assessments to conform with the eLumen requirement of 0-4 scale.

D. What are your most important plans (either new or continuing) for next year?

We will be hiring a replacement for the evening lab technician position.

We will be requesting a fourth full-time faculty. The form has already been completed.

We need to look at a reasonable way to comply with the unit requirements to be able to offer a Chemistry AS – T degree.

We will work with part-time faculty to develop a sustainable process for SLO implementation now that they will be compensated (according to the tentative contract).

E. Do plans listed under question (D) connect to this year's planning priorities? If so, explain how they connect. (Planning priorities will be finalized and added to this form in June 2015)

Planning Priorities for 2015-16

- ***Establish regular and ongoing processes to implement best practices to meet ACCJC standards***
- ***Provide necessary institutional support for curriculum development and maintenance***
- ***Develop processes to facilitate ongoing meaningful assessment of SLOs and integrate assessment of SLOs into college processes***
- ***Expand tutoring services to meet demand and support student success in Basic Skills, CTE and Transfer courses.***

Working on the AS-T for Chemistry is one of the College's main planning priorities (curriculum development).

Implementing a sustainable and meaningful Chemistry Program SLO process that involves part-time faculty is also a College priority as listed above.

F. Instructional programs: Did your program meet its program-set standard for successful course completion? (This data will become available and be added to this form in Fall 2015)

X yes no

(This data can be found here: <http://goo.gl/y9ZBmt>)

If your program did not meet your program-set standard, discuss possible reasons and how this may affect program planning or resource requests.

N/A

G. How have students been impacted by the work of your program since the last Program Planning Update (PPU)?

We have increased the number of sections of chemistry courses offered which should help more students complete their chemistry requirements in a timely manner.

Since the last PPU, the full-time faculty have been trained on applications for our newest chemical instrumentation, the GC-MS. We expect increased use of the instrument for the Organic Chemistry classes this coming academic year. In addition, the new polarimeter has been added to the suite of instrumentation that chemistry students are exposed to.

An Honors Project student also completed a project using the GC-MS instrument that he presented at the annual Honors Project symposium, the AAAS conference in San Francisco this June, and the Livermore Library poster exhibit in July 2015.

Several students participated in successful internships at Sandia National Labs.

Two chemistry students won the Tri-Valley Dream-makers and Risk-takers Award.

Students in 30A, 30B, and 31 will be using improved lab manuals starting Fall 2015.

Through a fundraising effort coordinated by Nan Ho with the assistance of chemistry and biology faculty, the Chemistry program has received a new class set of the solid state model kit allowing individual students to create models individually. More molecular model kits will also be made available to the students.

Chemistry students continue to be mentored for their participation in extracurricular science activities like the honor's project and the newest TED talk event held last spring.

The Program continues to encourage student participation in the LPC-LLNL Seminar series. In addition, Mike Ansell collaborated with the ACS local section president, Charlie Gluchowski, to hold the monthly ACS Meeting on campus. This event brought ACS community members to campus alongside a large number of LPC students to hear an LLNL scientist talk about bio-computational research at the lab.

The Program continues to find ways to reward deserving chemistry students through scholarships sponsored by the ASLPC, the Chemistry Club, and the Ansell Family award.

Part Two: SLO/SAO Assessment Review

Review your program's SLO assessment results for AY 2014-2015 and respond to the following questions.

A. Discuss how assessment results in at least one course in the program indicate success in student learning (OR) Discuss how assessment results of at least one SAO in the program indicate success in service to students.

For the 2014 – 2015 academic year:

12A SLO: Students should be able to write a detailed mechanism for a Sn1 Reaction.

-Data from one section in Fall 2014 (12A is taught in the fall only), indicate achievement of learning outcomes with more than half the students (18 out of 22) scoring a 3 or a 4.

12B SLO: Students completing 12B should be able to demonstrate proficiency in solving complex problems and conceptual understanding of content listed in the course outline as measured by the American Chemical Society Organic Chemistry series exam (beginning SP2015).(New rubric)

– Data from one section in Spring 2015 (12B is taught in the spring only) indicate that the students have exceeded the specific expectation of more than 50% (12 out 21) scoring at the median or above.

1B SLO: Students completing Chemistry 1B should be able to demonstrate proficiency in solving complex problems and conceptual understanding of content listed in the course outline as measured by the American Chemical Society General College Chemistry Full Year Exam. (Beginning SPRING 2012) (New rubric)

- Data from one section in Fall 2014 and in Spring 2015 indicate that the students have exceeded the specific expectation of more than 50% (12 out 22 and 11 out of 21, respectively) scoring at the median or above.

1A SLO: What percentile did the student achieve on the ACS standardized First semester of general chemistry test compared to the national average?

– Assessment data for Fall 2014 and Spring 2015 indicate that the specific expectation of 50% of students achieving a score of 3 or higher has been exceeded at 74% and 65%, respectively.

31 (New SLO): Students completing Chemistry 31 should be able to demonstrate proficiency in solving complex problems and conceptual understanding of content listed in the course outline as measured by the American Chemical Society 2006 California Chemistry Diagnostic Test .

– Data from Fall 2014 from 4 sections of Chemistry 31 indicate that the students have met the specific expectation of the class median score equaling or exceeding the national median score. 58% achieved a score of 30 or higher (50 percentile or higher).

30A SLO: Students should be able to define concentration units of solutions (e.g., molarity and % concentration) and use these definitions in problem solving.

– Data from Fall 2013, Spring 2014, and Spring 2015 indicate that the specific expectation was achieved: more than 50% achieving a score of 3 or higher.

30B SLO: The student should be able to describe one function for each type of biological molecules.

– Data from Fall 2014 indicate that the specific expectation was achieved: 12 out of 13 students achieving a score of 3 or higher.

B. Discuss assessment results that indicate a need for improvement.

None. All the assessments collected for Fall 2014 – Spring 2015 indicate achievement of specific expectations.

C. Instructional Programs: For the course(s) listed in (B) above, discuss how your program, or someone in your program, made changes or plans to make changes in pedagogy as a result of SLO assessment results.

Non-Instructional Programs: For the areas(s) listed in (B) above, discuss how your program made changes or plans to make changes as a result of SAO assessment results.

N/A

D. Instructional Programs Only: Give an example of a change in the number of units and/or lab hours based on assessment data, if applicable.

None.

E. Instructional Programs: Discuss how distance education course assessment results compare to face-to-face courses, if applicable. (Respond to this question if your program has distance education courses.)

Non-Instructional Programs: Discuss how SAO assessment results for online services compare to face-to-face services, if applicable. (Respond to this question if your program provides services online.)

N/A

F. Did your program discover the need for additional resources (for AY 15-16 or 2016-17) based on the assessment results? YES NO

If yes, please explain.

The library resources support student success in Chemistry. A stable source of funding needs to be found for the library. Our students use multiple databases, reference books, journals, and other resources that need continuous updating to keep up with state-of-the-art science in the field.

Part Three: SLO/SAO Continuous Improvement Process

A. SLO Planning through AY 2016-17

As appropriate for your program, please address each of the following areas. For each area, describe your program's plans starting now and continuing through the academic year 2016-17. Focus on how the program's SLO process will impact student learning or the student experience at Las Positas College.

1. SLO/SAO assessments: How does your program plan to use assessment results for the continuous improvement of student learning or services? (*NOTE: 100% of courses in your disciplines should be assessed a minimum of once every two years. Each program must assess at least 25% of its courses every semester. Programs with SAOs should assess at least 50% of their SAOs every year.*)

Examples might include (Your responses may vary.):

- changing number of units/lab hours
- changing pedagogy/curriculum
- changing assessments
- changing service hours
- changing modes of service delivery

Our students have generally done well in terms of meeting the specific expectations for the Program's SLO's based on the data that we have. We will continue to provide the best content and lab curriculum that have helped us achieve good SLO results.

In order to effect continuous improvement, we first and foremost must ensure that any planned changes are supported by statistically valid data resulting from validated and reliable assessments. We continue to work on the following:

1) Collection of valid and reliable assessment data: We have been fortunate that we are able to use assessment tools that have gone through validation and reliability tests provided by the American Chemical Society. These tests allow us to comprehensively assess most if not all of the outcomes listed in our course outlines for 12B, 1A, 1B, and 31. One of the challenges that have limited our data however was the requirement to bin our score distributions to a 0-4 scale. This has resulted in inconsistencies in terms of how the percentile scores were distributed within the 0 – 4 scale. We

have now corrected these for 3 of the 4 courses so that the 0 – 4 score distribution is more easily interpreted in terms of our specific expectation (At least 50% of students achieving a score equal to or higher than the median.).

2) Collection of larger number of assessment results: To collect more data for statistical validity, we continuously encourage participation of part-time faculty and have been fortunate to have at least 1 to 3 of them participate every semester. The new tentative contract promises to improve upon this.

3) Refinement, revision, and replacement of SLO's: We are ready to assess new SLO's for 30B. A new 30A SLO was introduced in the Spring of 2015. We continue to explore the idea of using an ACS exam to assess learning in our 30A and 30B. The issue is that because these courses are designed for allied health majors, the emphasis is on certain chemistry topics that have a direct impact on and applications to biological concepts. These don't always parallel the types of questions assessed in the ACS exams for these levels of courses.

2. Have your assessment results shown a need for new/revise SLO/SAOs? YES NO

If yes, complete the table below:

<p>Estimated number of courses for which SLOs will be written or revised:</p>	<p>For Spring 2015:</p> <p>New SLO's with the same learning outcomes but new rubrics were developed for 12B and 1B to reflect a scoring system that is more indicative of the distribution around the median. With these new rubric changes, our specific expectations have changed as well.</p> <p>We implemented a new SLO and assessment for Chemistry 31 using the ACS Diagnostic Exam. This is a more comprehensive assessment exam.</p> <p>For Fall 2015:</p> <p>New SLO's will be added for 30A and 30B and an instrumentation use SLO.</p>
<p>Estimated number of SAOs that will be written or revised:</p>	<p>N/A</p>

a. What courses or SAOs will your program assess during this academic year (2015-16)?

We are hoping to assess each of our 7 courses at least once this coming academic year.

- b. Instructional programs only: In order to budget to pay part-time faculty to work on SLOs during the academic year 2015-16, estimate the number of part-time faculty in your program who are likely to participate in the SLO process in 2015-16.

Number of Part-Time faculty who will participate in the SLO process (creating, assessing or discussing SLOs)	
Fall 2015	We expect 100% participation from all our part-time faculty.
Spring 2016	We expect 100% participation from all our part-time faculty.