PROGRAM REVIEW Fall 2017

Program: CHEMISTRY

Division: Math, Science, Engineering & Public Safety (MSEPS)

Date: October 16, 2017

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SLO/SAO Point-Person: Michael Ansell

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

Uses: *This Program Review will be used to inform the campus and community about your program. It will also be used in the processes of creating Division Summaries, determining College Planning Priorities and allocating resources. A final use is to document fulfillment of accreditation requirements.*

Time Frame: *This Program Review should reflect on program status during the 2016-17 academic year. It should describe plans starting now and continuing through 2017-18. This document also provides the opportunity to describe more long-term plans (optional).*

Sections: *The first section of this Program Review focuses on general program reflection and planning. The second section is a review of curriculum. Only programs with curriculum need to complete Section 2. The third section is a CTE update, to be completed by CTE programs only.*

Topics: *A list of topics of particular interest to Program Review readers can be found here:* https://goo.gl/23jrxt

Help: *Contact Karin Spirn: kspirn@laspositascollege.edu*

Instructions:

1) *Please respond to each question as completely as possible.*
2) *If the requested information does not apply to your program, write "Not Applicable."*
3) *Optional: Meet with your dean to review this document before October 13.*
4) *Send an electronic copy of this form to Karin Spirn and your Dean by October 16*
5) Please note: Some information needed for this Program Review will become available in August 2017.

Links:

Program Review Home Page: https://goo.gl/XATgjJ

Fall 2016 Program Review Updates : https://goo.gl/YV8QOt

Frequently Asked Questions: https://goo.gl/iIhRtt

ACKNOWLEDGEMENTS

In the last several years, the Chemistry Program has seen a tremendous amount of positive growth in its course offerings, part-time faculty colleagues, number of students served, modern instrumentation, lab support, activities that strengthen students' interest in science, and learning opportunities for students. While this most recent Program Review focuses on the many needs to help sustain and support this growth and our ability to serve students, we do want to express our gratitude to the entire campus community for its support of our Program and its Mission. In particular, we want to acknowledge the following people.

- Our wonderful, appreciative students without whom the Program will not exist and whose feedback we rely on to make sure that our classes are meeting their needs to achieve their academic goals.
- All Full-time and Part-time Chemistry Faculty for their collaborative nature; willingness, flexibility, creativity, and resourcefulness to always find a better solution; and overall excellence in teaching.
- Our part-time Chemistry faculty who have been contributing in SLO implementation, improvement of lab curriculum, encouragement of students to participate in science-related activities, mentoring, supervising honors' projects and independent study, and in representing the Chemistry Program in various events.
- Mike Ansell, coordinator for the last 14 years, whose vision, stewardship, and leadership have steered the Program toward more classes for our students, more modern instrumentation, more lab support staff, increased and improved lab facilities, increased participation by part-time faculty in program events, and scholarship and internship opportunities for our students.
- Our current and former Laboratory Support Staff, Gerry Gire, Eva Ng, Shirley Ly, Brandon Butler, Cindy Black, Gary Wilkes, Kauhleen Mangayan, Miki Okada, Samantha Portea, temporary lab staff, and student workers for their collaborative spirit; competence in all that they do; and their willingness, patience, resourcefulness, and cleverness in coming up with workable solutions despite dwindling financial and time resources. Special thanks go to Gerry Gire, retired lab coordinator, who tirelessly advocated for our Program. She leaves an indelible mark in the thoughtful ways she has helped improve our laboratory curriculum and our Program in general. Lastly, Gary Wilkes, current lab coordinator, deserves a lot of kudos for maintaining the same quality of lab support starting this semester while juggling between being in a new position himself and coordinating all new lab techs.
- Dean Nan Ho and Linda Cross for their innate ability to anticipate what we need and just get things done before we even ask. They work tirelessly in the background, quietly and thoughtfully but efficiently and, in some cases, most expediently, to help our Program meet its needs. We also would like to acknowledge former Dean Lisa Everett and Karin Rose who similarly provided strong support for our Program.
- The Biology Faculty for their collaborative nature in sharing lab support staff and lab facilities and in ensuring that we provide maximum access and an excellent curriculum to our shared students.
- The entire Math, Science, and Engineering faculty for continually working together to provide access to critical classes for transfer.
- Pauline Trummel, Cheri Morrell, and their crew of student tutors in the LPC Tutorial Center for providing a welcoming and centralized place for students to find help.
- ASLPC for allowing us to recognize and award scholarships to excellent students.
- Rajinder Samra for providing detailed data for the program and helping the program complete the validation process for the Chemistry assessment exam.
- Student services for supporting and sponsoring activities that allow us to highlight the program to students through the Major's Faire and the Spotlight Series.
- The LPC Library faculty and staff for providing valuable resources both online and in print, collaborating to select new resources, answering questions for students, and holding library orientations each semester for all of our Chemistry 1A and Chemistry 12A courses.
- The people of the tri-valley area and Measure B Funding for allowing us to expand and improve our current facilities and provide state-of-the-art instrumentation and facilities to our students.

Section One: Program Snapshot

A. Data Review: Describe any significant changes to your program's data since last year's Program Review Update (Fall 2016).

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 [available August 2017]
- CEMC Data
- Labor Market Data
- SLO/SAO Data

The Chemistry Program continues to provide students:

- access to courses for timely completion of academic requirements
- excellent instructors and a teaching environment that promote student learning success
- a safe but exciting laboratory experience focused on a visual and tactile illumination and reinforcement of chemical principles
- hands-on use of research-grade equipment and instrumentation
- learning support outside the classroom through the tutorial center
- activities that encourage and support their interest in science through seminars, opportunities for internships, and independent study and honors' projects.

Some changes in the Program are listed below:

Addition of classes:

- Our FTEF increased from 17.10 FTEF in 2016 – 2017 to 18.75 in 2017 – 2018. These additional FTEF went into adding a third section of 12A and turning the single evening section of 30A in the fall into a double section. For Spring 2018, the additional FTEF went into adding a third section of 12B and adding a single section of 31.
- The number of sections offered increased from 41 in 2016-2017 to 45 sections in 2017-2018.
- The third section each of Chem 12A in the fall and Chem 12B in the spring was added to meet the demand for this major's class. Without this additional section, students on the waitlist had to wait a full year to complete their Organic Chemistry requirement for transfer. All three sections of 12A filled in Fall 2017.

Hiring of new part-time faculty:

- Several interviews were conducted in the fall and spring of last year and four new part-time faculty were hired to cover faculty leave in the spring and to teach a summer course.

Hiring of a new, permanent Dean:

- Interviews were successfully conducted last year to hire Dean Nan Ho. Nan has been an outstanding advocate for our Program and understands it from top to bottom.

Request for a new full-Time faculty:

- This request was denied for the second year in a row, despite ranking just two spots below the cutoff in the previous year, the tremendous growth and complexity in our program, and falling well below 50% of our FTEF being taught by Full-time faculty.

Replacement of lab coordinator and lab techs:

- Five different hiring committees were convened in a span of 10 months in Spring, Summer, and

Fall 2017. Our long-time laboratory coordinator, Gerry Gire, retired. Lab tech Gary Wilkes was promoted to lab coordinator and resigned his former position. Lab tech Eva Ng resigned in May to pursue a teaching program. Shirley Ly resigned in September for a new job at UC Berkeley. Cindy Black retired in the spring. The vacancies have been filled in by multiple temporary lab tech hires throughout the year.

Continued validation of Chemistry Assessment Exam

- The Chemistry Assessment Exam is still undergoing validation and is currently in provisional status. This process requires surveying Chemistry 31 students and faculty every semester and Chemistry 1A students and faculty every fall semester to collect data.

Increased participation of part-time faculty in improving the program:

- Both new and continuing part-time faculty have increased their participation in professional responsibilities that help our students. Some part-time faculty have continued to assist in improving our lab experiments by taking time and careful attention to send suggestions for revisions for the 1A, the 31, and the 30A lab manuals. Some part-time faculty have been working on improving the Chem 30B labs by actually testing new and better procedures and working on the revisions themselves. Many part-time faculty participated in the Majors' Fair, the Health Fair, and the Spotlight Series.

Switch to Canvas and eLumen

- All full-time faculty, our new part-time faculty, and almost all of our continuing part-time faculty have been trained in and have switched or will be switching to using Canvas in the spring.
- All full-time faculty and most of our part-time faculty have been trained to use eLumen to enter assessment data and analysis.

Textbook change for the General Chemistry series, 1A and 1B

- Students taking Chemistry 1A this fall began using a new textbook. The Chemistry 1B students will begin using the new textbook starting next spring. The old textbook which has been in use for more than 11 years and is now in its 10th edition has been replaced by a newer textbook authored by the same author as the Chemistry 31 textbook. Mike Ansell coordinated the ordering of examination textbooks, evaluation by full-time and part-time faculty, and collection of surveys from evaluators. This represents a huge change that presents both a challenge because of the added work required to switch to a new text but also opportunity for improved learning outcomes for students.

ANALYSIS OF CHEMISTRY DATA PACKET

- ENROLLMENT: Total course enrollments for both fall and spring are at their peak for the last 5 years. As expected, there are fewer enrollments in the spring due to fewer sections offered compared to fall. Increase in total course enrollments from 386 (FA15) to 438 (FA16) students, 13% increase. 34% increase from the lowest enrollment numbers (326) in the last 5 fall semesters. 5% increase in total course enrollment between SP16 and SP17. However, the total spring enrollments only rose by 15% between the max and the min.

- GENDER: A wider gap in gender ratio 54% female to 46% male in FA16 compared to 50%-50% ratio in FA12 and FA13. Increase in females starting FA14 semester. Similar distribution for spring data. *FA16 gender gap in LPC overall is smaller (51% female to 49% male) than the students in the Chemistry program.*

- AGE: Similar to last year's age distribution for both fall and spring semesters. % of 19 years or younger still in a decline from a high of 42% in FA14. *The Program has a relatively larger percentage of students 21 years and younger 65% compared to the College at 55%.*

- RACE-ETHNICITY: 3-point rise in Hispanic and multi-ethnic coupled with 5-point decline in White. Big drop in % white from a high of 49% in the last five years to 36% in FA16. 10-point rise in Hispanic from FA12 to FA16. Similar distribution and trend for spring data. *The race-ethnicity distribution in our program closely mirrors that of the entire College.*

- STUDENT ENROLLMENT STATUS: Not much change. The "continuing" group remains the dominant group at 82%, even higher for spring enrollments at 96% continuing as expected.

- STUDENT UNIT LOAD: No statistically significant change. 7-point decline in full-time students from a high of 69% in FA12 to 62% in FA16. Relatively higher %full-time students for spring semesters (e.g. FA16 at 62% while for SP17, it is 74%). *There is a relatively large difference compared to the percent of full-time students overall in the College (38%).*

- STUDENT EDUCATIONAL GOAL: No change, the dominant group with "transfer" as educational goal constitutes 82%, higher than the overall %transfer for the College at 65%. Similar data for spring semesters.

- HIGHEST EDUCATIONAL LEVEL: No statistically significant change from the last 5 years. Similar data for spring semesters.

- STUDENT PERFORMANCE: No big change from last year, few percentage point change in the last 5 years. Success rates averages are 74% and 78% in the fall and spring, respectively, for the last 5 years (min of 71% and max of 82%). Completion rates averages are 83% and 85% in the fall and spring, respectively, for the last 5 years (min of 81% and max of 89%). Relatively higher percentages for both success and completion rates in the spring semesters (as high as a 10-point difference in success rates between FA16 and SP17). *Similar to overall College data.*

- ENROLLMENT MANAGEMENT PART 1: Increase in productivity from last year by 22 points probably due to increase in sections mainly through doubling of single sections or addition of double sections. More than 10% increase in FTES between FA15 and FA16. Lower productivity numbers for spring probably because there are fewer double sections. *Chemistry has relatively lower productivity than the overall for the College due to lab student number restrictions.*

- ENROLLMENT MANAGEMENT PART 2: It is not surprising that our %FTEF from full-time faculty continues to decrease (from 53% five years ago down to 44% for the fall semesters. The low percent numbers in FA13 and FA14 are due to leave absences). There has been no additional faculty to cover the increase in sections offered. The very low number of 24% for SP17 is compounded by one of the full-time faculty going on leave. These numbers are similar to the overall College %FTEF. Our fill rate is at a peak of 108% (overall college fill rate is 90%).

B. Changes to Program and Needs: Describe any significant changes to your program or your program's needs since the previous Program Review Update (Fall 2016).

For changes to programs, see responses in Part A above. For updates to program needs see below:	Mark an X next to each area that is addressed in your response.

Facilities:

- The General Chemistry lab 1802 is maxed in terms of lab scheduling and locker use. We need separate labs for Chem 1A and 1B.
- Chem lab 1805 is maxed with 3 sections of 12A/B course.
- We need separate 30A and 31 labs as well to accommodate increase in enrollments and provide more optimal scheduling and locker use.
- We need more classrooms close to the chemistry labs.
- At the very least, the three current labs need to be renovated for various reasons as specified in the Facilities section below. A better solution is to build a new set of chemistry labs as part of a new science building. See facilities section below.

Supplies and equipment: More students in the program means more chemicals used, more glassware and other equipment needed, and higher frequency of use of instruments. With the 10% increase from last year in the number of sections offered and the addition of third sections of 12A and 12B, the Program has increased need for:

- Supplies budget to cover increase use of chemicals and glassware. In particular, the third section of the 12AB series requires special chemicals, locker equipment, and increased equipment maintenance and repair funding for instrumentation.
- Equipment repair and maintenance funding. As our instruments and equipment get older and see more use, they tend to break down more often and require more maintenance. For example, the Atomic Absorption spectrometer is still not functional after it broke down at the end of September. We were able to consult with Perkins but there is currently no service or repair contract for this instrument.

- Our Infrared Spectrometer needs to be replaced. We will be submitting an IER request for this in November 2017.
- Our NMR will need to be replaced in the next 2-4 years, especially with the addition of a third section of 12A and 12B.
- The plastic protective covers for the individual fume hoods in the 1802 and 1805 labs will need to be replaced in the next 1-2 years.

Human Resources

- We are submitting a faculty position request for a fourth full-time chemistry faculty for the third time this fall.
- We would like the release time for the Chemistry coordinator to increase from 0.7 CAH to 2.0 CAH. The Coordinator duties have increased in the last several years with more hiring of part-time faculty and classified personnel, SLO coordination, increased lab

Definitions of terms: https://goo.gl/23jrxt

	Community Partnerships/Outreach
X	Curriculum*
X	Enrollment Management
	External Factors
X	Facilities,** Supplies and Equipment (Including Software)
X	Financial/Budgetary
X	Human Resources
	Learning Support
	LPC Planning Priorities https://goo.gl/LU99m1
	Pedagogy
X	Professional Development
	Services to Students
X	SLO/SAO Process
X	Technology Use

*Curriculum will also be addressed in Part 2 (Curriculum Review).

**Facilities will also be addressed in Question H.

instrumentation, more students served with 60% increase in number of sections since 2012, requesting funds for maintaining, replacing, and acquiring new lab equipment, etc.

- We need to increase lab staff to support the increase in chemistry sections, faculty assistance in student instrumentation use during lab hours, repair and maintenance due to aging equipment and instruments, acquisition of new equipment, and development and update of lab curriculum. Requests for additional lab staffing are strongly justified by the 46% increase in number of biology and chemistry lab students served per FTE. In the summer, for Chemistry alone, the number of sections increased from 5 to 8 supported by the same number of lab tech FTE (biology had a comparable increase in summer session lab classes). At minimum, we will be requesting:
    - Conversion of current 10-month, 60% position to a 12-month, 100% position.
    - A new 12-month, 100% position.

<u>Financial/Budgetary</u>

- All the program needs specified for supplies and equipment, new lab sections, and new lab tech positions or increased lab tech hours require increase in the budget allocated for the chemistry program.

<u>Technology Use</u>

- We need to continuously update the chemistry department website and individual faculty websites. We would like a more accessible program or application for creating and updating faculty and program websites. We currently use Contribute, which is only licensed on one faculty member's desktop computer.

<u>SLO/SAO Process</u>

- We would like to create more comprehensive SLO's for Chem 30A and 30B. We will be reviewing the appropriateness of using ACS standardized exams for assessing content knowledge in these courses or other alternatives.
- We need to keep collecting more assessment data for all of our courses so we can make more meaningful analysis based on statistically robust data.
- *From last year: Find a sustainable way for all full-time and part-time faculty to discuss SLO's and assessments without impacting their already tight schedules and limited time on campus.*

<u>Professional Development</u>

- As last year, we would like additional professional development funding to increase the $250 allocation per

person to attend Chemistry-focused conferences. Enrollment Management • We would like to add another section of Chemistry 1A – the high number of waitlisted students in Fall 2017 warrants 1 or even 2 more new sections are needed to meet the demand. Unfortunately, we cannot add any more sections without having to drastically change the lab schedule in 1802 to squeeze 1-2 new lab sections and have more students share lockers. Students prepare reaction products for use in future lab periods that must be stored in their lockers. They cannot store products in lockers shared with other students. • We would like to retain the third section of the 12A/B series in the discipline plan for 2018 – 2019. Curriculum • Some of our labs need updating. There is also a need to introduce newer, more modern labs that incorporate the use of our instrumentation, the GC-MS in particular. Full-time faculty will be attending a Transforming STEM conference where they hope to learn about new innovations in lab experiences for students.	

C. Reflection: What plans from the 2016 Program Review Update or any previous Program Reviews/Updates have been achieved and how?

Our most important plans from last year (*from 2016 Program Review*):
 	
• *Find a sustainable way for part-time faculty to be involved in the discussion without impacting their already tight schedules.*
  ○ We are still working on this. Our focus currently is to help new part-time faculty with the SLO process so that we can continue to collect more assessment data for all of our courses. PT faculty have also been working on updating lab curriculum, which is an ongoing process.
 	
• *Hire a fourth faculty.*
  ○ We resubmitted a request last year but it was not approved. We will try again this year.
 	
• *Continue to maintain a pool of potential part-time faculty.*
  ○ Four new PT Faculty were hired last year. Our PT faculty pool is significantly deeper than it has ever been before. There are at least 3 PT faculty
	Mark an X next to each area that is addressed in your response.
	Definitions of terms: https://goo.gl/23jrxt	

		Community Partnerships/Outreach
		Curriculum*
	X	Enrollment Management
		External Factors
	X	Facilities,** Supplies and Equipment (Including Software)
		Financial/Budgetary
	X	Human Resources
		Learning Support
		LPC Planning Priorities https://goo.gl/LU99m1
		Pedagogy
		Professional Development
		Services to Students

members who will not have assignments in the spring of 2017.
 	
• *Request a half-time, 10 month lab tech position.*
  ○ We will be submitting a request to convert a part-time to a full-time position and a request for a new lab tech position.
 	
• *Request a third organic chemistry section.*
  ○ This was approved for the discipline plan for this year. We plan to request this again for next year's discipline plan.
 	
• *Continue to request increase in equipment (including glassware and other locker materials) and chemical supplies budget and access to science building classrooms to meet the needs of more sections.*
  ○ There was about a 5% increase in the chemistry supplies budget from last year to this year. The maintenance and maintenance contract budget also increased by about 30% from last year.
  ○ See new needs in other sections.
 	
• *Look into how we can expand our lab facilities to accommodate growth in the program. We will be needing a fourth chemistry lab soon.*
  ○ We have submitted facilities request plans to our Dean and also described in detail the facilities needs of the Program in this Program Review.
	X	SLO/SAO Process

		Technology Use
	*Curriculum will also be addressed in Part 2 (Curriculum Review).	
	**Facilities will also be addressed in Question H.	

D. Impacts to Students (Optional): Discuss at least one example of how students have been impacted by the work of your program since the last Program Review Update (only if you did not already answer this in Questions A, B or C).

• The additional sections of Organic Chemistry, Chem 30A, and Chem 31 for this year will improve student access courses to help timely completion and transfer. • Faculty serve as advisors to student clubs. • Faculty support honor's projects and independent studies. For example, one student is working with Organic Chemistry students to assist in instrumentation use. Two students are working with a part-time faculty on Fridays to do lead analysis using the AA instrument. • Faculty provide opportunities for students to participate in seminars, poster sessions, and internships. • Former students now work as biology and chemistry lab support staff. • No scholarship awards to outstanding Chemistry students were given out last year.	Mark an X next to each area that is addressed in your response.	
	Definitions of terms: https://goo.gl/23jrxt	
	X	Community Partnerships/Outreach
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	X	Enrollment Management
		External Factors
		Facilities,** Supplies and Equipment (Including Software)
		Financial/Budgetary
		Human Resources
	X	Learning Support

• The Program continues to award high-scoring students in the ACS General Chemistry and ACS Organic Chemistry National Exams. • Students completing General Chemistry and Organic Chemistry continue to match their national college and university peers in their performance in the American Chemical Society National Exams. • Both full-time and part-time faculty participated in the Major's Fair in April 2017, the Amador Valley High School Health Fair in March 2017, and the Spotlight Series in June 2017 to inform students about the Chemistry Program at LPC. • On October 2017, Hispanic high school students through the HACU HIS Grant Program will be visiting the three chemistry labs to observe experiments going on and tour the lab facilities. • Faculty continue to attend professional development opportunities that improve teaching and student learning; ACS seminars, LLNL-LPC seminars, HSI STEM Conference, Guided Pathways Conference, Transforming STEM Conference, Advanced Placement (AP) workshops, etc.		LPC Planning Priorities https://goo.gl/LU99m1
		Pedagogy
	X	Professional Development
	X	Services to Students
		SLO/SAO Process
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	*Curriculum will also be addressed in Part 2 (Curriculum Review).	
	**Facilities will also be addressed in Question H.	

E. Obstacles: What obstacles has your program faced in achieving plans and goals?

Lack of lab space and lockers • Although there is a high demand for the Chemistry 1A course, we have been unable to add more sections due to the lack of lab space and lockers in 1802. The lack of lab space has also affected our ability to offer classes that are optimal for students (e.g. afternoons and evenings). We will be unable to add more Chemistry 12A/B and Chemistry 30B classes due to lack of lockers in 1805. Lack of funding for supplies and equipment • We still lack funding to fully equip the third section of the Organic Chemistry. High turn-over rate of lab support staff • High turnover of lab support staff has resulted in many hours spent in hiring and loss of continuity and stability in the lab prep area. Insufficient lab staffing: • From Fall 2013 to the present, the Chemistry program offerings have grown from 32 sections to 45 sections per year. The Biology program has also grown dramatically during the same time frame. Yet, during this period, only one new lab tech position has been added (Spring 2014). • Between Summer 2016 and Summer 2017, the chemistry offerings went from 5 to 8 sections with a comparable	Mark an X next to each area that is addressed in your response.	
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	*Curriculum will also be addressed in Part 2 (Curriculum	

increase in biology offerings, supported by the same number of lab staff, 1 lab tech and the lab coordinator. • Our instruments and equipment also are aging and are requiring more frequent repair and maintenance. Our 10-year old AA is currently down and with new lab techs and a new lab coordinator already overloaded with lab prep work, we have been unable to get enough help to fix it. • We would like to request lab tech time to assist faculty in helping students run the instruments during lab time (GC-MS, NMR, and AA in particular) but our lab techs are so overwhelmed that we have not been able to do this. • Assistance from lab techs is also important in helping faculty develop and test new lab experiments, especially for new instruments like the GC-MS. <u>Aging instruments and equipment</u> • With the exception of the new GC-MS and polarimeter, all of our major instrumentation are 10 years or older. As they age, they require more maintenance and frequent repair. • The 1B lab and the 1A lab students have been unable to run the Atomic Absorption spectrometry experiment because the instrument is down. It is quite costly to have a repair service person to come to the campus to troubleshoot so faculty have had to deal with trying to find a fix. • The individual student fume hoods in both 1802 and 1805 replaced about 5 – 6 years ago are starting show wear and tear. At the very least, many of the plastic hood covers will need to be replaced soon. • The entire fume hood system for the three labs have failed at least twice this semester. When fume hoods are not operating, lab classes will need to be cancelled. <u>eLumen transition and consistent assessment data collection</u> • Recent changes in eLumen have affected the Program's ability to collect long-term SLO assessment data that is consistent and reliable enough to use for improvement plans. Examples of these include changes in rubric scales over the years, criteria for what an SLO should be (broader, more comprehensive versus specific), and the move from the older version to the newer version of eLumen. In addition, the requirement to fit our data into a standard 0 – 4 scale has resulted in loss of statistical detail that might be more relevant when analyzing data for the entire program. <u>Lack of a fourth full-time faculty</u> • The lack of a fourth full-time chemistry faculty has affected the program in many ways. The number of sections offered by the Program has grown by 67% since the last full-time hiring was done in 2006 (from 27 to 45 sections annually). We have had to spend more personnel hours	Review). **Facilities will also be addressed in Question H.

on interviewing and hiring part-time faculty to cover additional classes. The previous summer, we have had to cancel a class due to lack of faculty to teach it. In 2016 – 2017, 4 new part-time faculty had to be hired to cover classes. A fourth faculty is necessary to lend some stability to the department when another faculty takes a leave. The Program has not had an infusion of fresh talent, enthusiasm, and outside ideas that are vitally important for growth of the Program and for Student Success. With a fourth faculty, more time can be devoted to modernizing our lab curriculum and creating exciting courses accessible to all students such as "Chemistry and Society," "Environmental Chemistry," and "Wine Chemistry". There is a particular need for a full-time faculty who can dedicate their energy, enthusiasm, and creativity to revitalizing and strengthening our introductory chemistry curriculum (31, 30A, and 30B). Many courses, including biology, rely heavily on a strong introductory chemistry preparation of students to support their success in these courses. The Program has acquired excellent instrumentation through Measure B including Carbon and Hydrogen NMR, FT-Infrared Spectroscopy, GC-MS (Gas Chromatography-Mass Spectroscopy, AA (Atomic Absorption Spectroscopy), Polarimeter, and Vernier Logger-Pro Interfaced sensors for temperature, UV-Visible Spectroscopy, radiation detection, pH measurements, etc. Each of these instruments requires a different expertise to operate, maintain, keep updated, develop curriculum for and, most importantly, teach! A fourth full-time faculty is badly needed to help spend hours learning, developing, and training others on these instruments. A fourth full-time faculty with experience using and teaching with each of these instruments would make the investments in instrumentation significantly more valuable. Student success in chemistry impacts all other science and engineering programs. A fourth full-time faculty will also help the Program provide more assistance to important initiatives that support success in STEM fields: collaborations with industry and national laboratories (e.g. SVLG), seminar speaker series, internship programs, mentoring programs, HSI-STEM activities, Transforming STEM program, Guided Pathways, etc.

<u>Lack of lecture classrooms</u>

- It has become more difficult to find more optimal scheduling for our classes due to lack of classroom availability in proximity of the science building.

F. Short Term Planning: What are your most important plans (either new or continuing) for next year?

Based on the Program Needs and Obstacles identified in Sections B and E. above, our short-term plans are listed below.

In 2017 – 2018, we plan to:

- Request to hire a fourth full-time faculty.
- Request to convert a part-time, 10-month lab tech position into a full-time, 12-month position.
- Request a new full-time, 12-month lab tech position.
- Request funding to replace our Infrared Spectrometer.
- Request that the third section of the 12A in the fall and the 12B in the fall be retained in the discipline plan for 2018-2019.
- Request funding for Organic Chemistry additional locker equipment, kits, and glassware for the third section.

Others:

- Continue data collection for the chemistry assessment exam validation process.
- Explore how we can add another section of 1A to meet the demand while waiting for a new chemistry lab to be built.
- Assist part-time faculty in SLO assessment and analysis and continue to collect more SLO assessment data.
- Purchase new updated ACS exams for 1A, 1B, and the 12AB series for SLO assessment.
- Pilot using an ACS exam for the 30A and the 30B courses.
- Contribute to the facilities master plan.

For 2018 - 2019:

- Continue data collection for the chemistry assessment exam validation process.
- If appropriate, use ACS exam assessment for 30A and 30B courses.
- Request funding for any needed replacement of instruments and equipment.

Mark an X next to each area that is addressed in your response.

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	Pedagogy
	Professional Development
	Services to Students
X	SLO/SAO Process
	Technology Use

*Curriculum will also be addressed in Part 2 (Curriculum Review).

**Facilities will also be addressed in Question H.

G. Long Term Planning (Optional): Please detail any long-term plans for the next 3-5 years. (Only if you have significant plans, such as implementation of a grant project, creation of long-term initiatives including those using restricted funds such as Equity or SSSP, construction and outfitting of a new building).

- Strongly advocate for new chemistry labs as noted in the facilities section above.

Mark an X next to each area that is addressed in your response.

	Definitions of terms: https://goo.gl/23jrxt	
		Community Partnerships/Outreach
		Curriculum*
		Enrollment Management
		External Factors
		Facilities,** Supplies and Equipment (Including Software)
		Financial/Budgetary
		Human Resources
		Learning Support
		LPC Planning Priorities https://goo.gl/LU99m1
		Pedagogy
		Professional Development
		Services to Students
		SLO/SAO Process
		Technology Use
	*Curriculum will also be addressed in Part 2 (Curriculum Review).	
	**Facilities will also be addressed in Question H.	

H. Do you have any facilities needs that are currently unmet? If yes, please describe.

The Chemistry Program has outgrown its current lab infrastructure even with the addition of the third renovated lab. It has become challenging and in many cases impossible to find time slots in all three labs to add more sections of our classes. Despite the demand, we are no longer unable to add any section of 1A or 1B because the General Chemistry Lab 1802 is maxed in terms of scheduling and locker use. We are unable to offer more 30A sections and 31 sections at an optimal time that works with student schedules for timely completion because these two classes are sharing a lab. The Organic Chemistry lab 1805 is maxed with three sections of Organic Chemistry starting this semester for a total of 18 hours of lab every week. This lab is currently being shared with 2 sections of 30B and locker use has reached its max as well. In some cases, up to three students have to share a locker.

While renovating the current chemistry labs in Building 1800 may seem like a less costly solution, it is not necessarily more cost-effective and is not the best solution to accommodate our expanding program for the following reasons:

- Our growing program needs at least two additional labs. There is no capacity to add 2 new labs in the current 1800 building. If 2 new chemistry labs are built in a different new building, it will require its own stockroom, instrument room, lab techs, and fume hood system because they will not be adjacent to the old labs.
- Building 1800 was designed before seismic codes changed in the mid-1990's, so major retro-fitting would be cost prohibitive (>$10M).
- Fume hoods in building 1800 already do not support the capacity of the extra hood installed and cannot be expanded. They have been breaking down frequently with classes cancelled.

The whole system will need to be replaced.
- Flooring, paint, plumbing, and electrical wiring are becoming more expensive to maintain.
- The current 1800 labs need to be expanded in size to improve safety.
- The current stockroom was badly designed with no natural light.
- Office space and classrooms are minimal in building 1800 and there are no conference/break rooms.

The Program would like to propose instead to build a set of 5 new chemistry labs as part of a new science building. We are requesting to build new labs so that there is one lab dedicated to every course (12A/B, 1A, 1B, 31, and 30A) with the exception of 30B. The new labs should have a larger footprint than the current labs as recommended by the American Chemical Society.

For the 1A and 1B General Chemistry labs, the number of lockers should be maximized and individual fume hoods should be installed in addition to at least 2 conventional wall fume hoods and a dedicated fume hood for the AA machine. These two labs can share a weighing room.

For the 12A/B Organic Chemistry lab, the number of lockers should be maximized and individual fume hoods should be installed in addition to at least 2 conventional wall fume hoods . Connected to this lab room should be the instrument room to contain all the instrumentation including weighing scales. There should be a big window between the instrument room and the O Chem lab.

For the 30A and 31 Introductory Chemistry labs, the number of lockers should be maximized and individual fume hoods should be installed in addition to at least 2 conventional wall fume hoods and a dedicated fume hood for the AA machine. These two labs can share a weighing room.

There should be offices and teaching classrooms adjacent to these lab rooms so that chemicals and equipment used for demonstration can be transported safely.

There should also be the required waste storage room, storage drawers and cabinets for bulk chemical supplies and equipment, and explosion-proof volatiles/flammables room.

I. Mission: Explain how your program's plans and accomplishments support the mission of Las Positas College:

Las Positas College is an inclusive learning-centered institution providing educational opportunities and support for completion of students' transfer, degree, basic skills, career-technical, and retraining goals.

The Chemistry Program's mission has not changed. The Program's positive outcomes as mentioned in preceding sections and previous program reviews and its ongoing and future plans for improvement are in line with accomplishing goals toward our mission and the mission of Las Positas College.

Our Mission is to serve the three diverse groups of students at Las Positas College:
- Transfer students majoring in the sciences and engineering; preparing for careers in medicine, pharmacy, or dentistry; or following a teaching pathway at primary, secondary, or post-secondary level.
- AA/AS and Certificate students enrolled in programs requiring knowledge of chemistry, for example, nursing, dental hygiene, etc
- Students completing general education course requirements

We strive to provide an outstanding set of classes taught by great teachers in small classes with high standards, attention to safety, and a focus on student success.

The Program offers the following degrees:
AS - Chemistry (Transfer Preparation)
AA – Chemistry Education

The Chemistry Program is integral to the Mission of Las Positas College. The Chemistry Program strives to be a high-quality, comprehensive educational program that will foster growth and success, both in its students and in its community. Our Program mission parallels the College mission: we serve and support students for completion of transfer, degree, career-technical, and retraining goals.

Many professional careers require the knowledge and training obtained in Chemistry courses. This includes careers in science, engineering, medicine, and technology. Chemistry provides the backbone for training in nursing, biotechnology, dental hygiene, and many other fields that do not require a Bachelor's Degree. In addition, there is a Chemistry course for students who come to the college with inadequate preparation for the traditional first year course in General Chemistry. Chemistry offers baccalaureate-level courses directed primarily for student transfer in science, engineering, and medical fields. We also offer courses for students completing programs in nursing, dental hygiene, viticulture, and other A.A./A.S. and certificate programs, or who are seeking either employment or training for jobs in water quality control. Many of the students in our classes for retraining goals are post-baccalaureate students who are taking courses to refresh their content and lab knowledge and review for national entrance exams. We also have a degree for students preparing to become teachers.

J. Program-Set Standard (Instructional Programs Only): Did your program meet its program-set standard for successful course completion? __X__yes _____no

[This data will be available in August 2017]

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

K. SLOs/SAO Reflection: Describe an example of how your program used course SLO data (CSLOs), Student Service Area Outcome (SAO) data or Program SLO data (PSLOs) from last year (2016-17) to impact student learning or achievement. <u>Focus on PSLOs or CSLOs where you have multiple semesters of data to analyze</u>. (Copy the box below if you would like to discuss multiple examples.)

Course Name, Program Name or Student Service Area:
While collection of assessment data for all courses has been ongoing for the past several years, we currently do not have consistent data from multiple semesters to analyze due to rubric and SLO changes and transition to the new eLumen version. As stated above, our plan is to collect more statistically consistent and reliable data in the next several semesters.
Text of the CSLO, SAO, or PSLO:

Describe the quantitative or qualitative results:
Discuss and reflect upon student achievement for this CSLO/PSLO/SAO. Discuss any actions taken so far (and results, if known) and your action plan for the future:
What changes in student achievement are evident across the semesters you analyzed? What are some possible explanations for these changes in student achievement?

L. Plans for Analysis of SLO/SAO Data: Identify the PSLOs, CSLOs, or SAOs that your program plans on focusing on the upcoming year with subsequent analysis. (Copy the box below as needed.)

Circle One: (CSLO) PSLO SAO
Course, Program Name, or Student Service Area: We plan to continue to assess the SLO's for all of our courses. Now that part-time faculty are supported in their participation in SLO assessment, we expect to see an increase in the data collected.
Text of CSLO/PSLO/SAO: CHEM 1A - General College Chemistry I • Students completing Chemistry 1A 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 First Term Exam. CHEM 1B - General College Chemistry II • 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. CHEM 12A - Organic Chemistry I • Students should be able to write detailed reaction mechanisms. CHEM 12B - Organic Chemistry II • 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). CHEM 30A - Intro and Applied Chemistry I • Students should be able to define concentration units of solutions (e.g., molarity and % concentration) and use these definitions in problem solving. CHEM 30B - Intro and Applied Chemistry II • Students should be able to describe the functions of different types of biological molecules. CHEM 31 - Intro to College Chemistry • 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.

If you plan on analyzing a PSLO, identify the CSLOs that feed into the PSLO that will need to be assessed.

Section Two: Curriculum Review
(Programs with Courses Only)

The following questions ask you to review your program's curriculum. To see the last outline revision date and revision due date:

1. Log in to CurricUNET
2. Select "Course Outline Report" under "Reports/Interfaces"
3. Select the report as an Excel file or as HTML

Curriculum Updates

A. Title V Updates: Are any of your courses requiring an update to stay within the 5 year cycle? List courses needing updates below.

No. All of our courses are current having been updated in May 2015. The next review and update process is May 2020.

The course outline for Chemistry 29 - Independent Study was just reviewed, updated, and approved in May 2017.

B. Degree/Certificate Updates: Are any degrees/certificates requiring an update to do changes to courses (title, units) or addition/deactivation of courses? List needed changes below.

No. We are still unable to develop an AS-T in Chemistry because the required units for transfer courses exceed the 60 unit cap.

C. DE Courses/Degrees/Certificates: Detail your department's plans, if any, for adding DE courses, degrees, and/or certificates. For new DE degrees and/or certificates (those offered completely online), please include a brief rationale as to why the degree/certificate will be offered online.

N/A

Section Three: CTE Updates
(CTE Programs Only)

A. Labor Market Conditions: Examine your most recent labor market data. Does your program continue to meet a documented labor market demand? Does this program not represent unnecessary duplication of other training programs in the college's service area? (Please note: your labor market data should be current within two years. Contact Vicki Shipman or the current CTE Project Manager for access to data).

B. Advisory Boards: Has your program complied with advisory board recommendations? If not, please explain.

C. Strong Workforce Program Metrics: Utilizing LaunchBoard, review the Strong Workforce Program Metrics. Review the data and then answer the following questions.

(Contact Vicki Shipman or the current CTE Project Manager for help accessing the data).

C1. Does your program meet or exceed the regional and state medians **for increased enrollments, completions, and/or transfer since your last program review**? If not, what program improvements may be made to increase this metric?

C2. Does your program meet or exceed the regional and state medians **for students gaining employment in their field of study**? If not, what program improvements may be made to increase this metric?

C3. Does your program meet or exceed the regional and state medians **for student employment rates after leaving the college**? If not, what program improvements may be made to increase this metric?

C4. Does your program meet or exceed the regional and state medians **for increased student earnings and median change in earnings?** If not, what program improvements may be made to increase this metric?