PROGRAM REVIEW UPDATE 2015-2016

Program: Biology

Division: STEMPS

Date: 10/12/2015

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SLO/SAO Point-Person: Hight

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

We have changed our biology rubric and updated Course Outlines to meet state standards and C-ID requirements. We have added additional sections based on enrollment and growth data, thus increasing the size of our program and students served.

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

We have completed all C-ID for courses that have already been C-ID approved. BIO 7A, BIO 7B and BIO 1A have been approved by the state; BIO 1B and 1C are in tentative approval. The BIO 1C Course Outline has been approved by the curriculum committee. The BIO 1B issue has been addressed by the curriculum committee and will be resubmitted to the state.
We have changed the biology rubric from BIOL to BIO effective fall 2015. We updated all Course Outlines for C-ID approval and/or currency update.
These accomplishments have been achieved through the Curriculum process, significant work by full-time and part-time faculty, and coordination with appropriate administrators.

We added a net total of six sections to the schedule since our last Program Review update. One section each of BIO 1A, BIO 1B, BIO 7B, BIO 7A and BIO 50, and two sections of BIO 30. This has been achieved through the Enrollment Management process and analysis of past and predictive enrollment data.

We have 100% course and program-level SLO assessment as of spring 2015. This was accomplished through much communication, coordination and work by our part-time faculty who teach the majority of biology classes.

Through the RAC process we acquired several new pieces of instructional equipment for student use starting fall 2015.

During fall 2015 Flex Day, our department held an SLO workshop on microscope use and assessment. Full-time and adjunct faculty as well as several classified staff members attended this workshop.

The department website has been updated significantly to reflect rubric changes, new faculty, new graphics on degree pathways and student club information; outdated links have been removed.

A new departmental brochure has been created with the help of Mary Lauffer.

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

The collaborative nature of our department is a strength that allows delivery of excellent student learning opportunities. This year, we are replacing one technician and brought in a large number of new adjunct faculty members. Our challenge is to maintain the close and effective working relationships we have among all parts of our department (FT faculty, PT faculty, technicians). During this transition, we are struggling with more demands on our lab staff to deliver more labs without more personnel and with many new adjunct faculty members who are not fully trained in best practices surrounding equipment use. This is causing wear and tear on our labs at an increased rate. The addition of new sections has put more pressure on the technicians who must span two buildings, support two disciplines (chemistry and biology), and take down and put up labs with tight turnaround times. We have worked, with the input of technicians and the Dean, to make the scheduling of labs as efficient as possible. For example, we attempt to run similar labs back to back, and build in time between two different labs to allow for the lab to be safely taken down and prepped for the next class. It has become even more important for our lab technicians to be able to support multiple classes, and to have technicians ready to jump in when another technician is absent. With more labs and more adjuncts, it will be a challenge to keep effective communications among different work groups.

Scheduling classes is an on-going challenge. In fall 2015 we attempted to schedule our lectures into two classrooms, however we had to use additional classroom space. The pattern repeated in spring 2016 with the addition of three new sections. We have worked diligently with the Dean to offer classes while optimizing multiple factors, such as:

- student access (e.g., day and evening classes)

- block-scheduling patterns
- ensuring that students can take other required classes (e.g., math, chemistry and physics)
- ensuring student completion
- efficiency for lab technician work load
- student access to the Biology Learning Center
- the specialized nature of certain lab rooms (e.g., equipment and facility access and particular safety issues)
- lecture room availability
- ensuring full-time faculty load
- allowing enough time in between labs for technicians to break down and put up new lab preps safely.

Due to an improving economy and the fact that some of our adjunct faculty have been getting full-time jobs, we continue to struggle with recruiting and maintaining a strong adjunct pool. In summer 2015 we lost three of our adjunct to full-time jobs, and the Dean had to scramble to fill those classes with faculty. With more sections added to the spring 2016 schedule, it will be increasingly difficult to fill those positions.

We have already begun initial work to create Transfer Degrees and have been working closely with the Curriculum committee to interpret the state mandates and make the appropriate decisions for our degrees.

Below is a passage from our fall 2014 Program Review Update.
"Hands-on manipulation of anatomical models is a predictor for student success and student retention. Currently, students in the entire biology program share access to the Biology Learning Center (BLC). This space is utilized extensively and well beyond capacity, with more than 20 students in the room; there are only 12 workspaces. We predicted this would be an issue when the building was designed and our planned anatomy student learning space was eliminated from the architectural plans due to budget cuts. As a result, this crowded space compromises student access to and working room to examine and study anatomy models. Because of the crowds, students have given up trying to find a space to work."

The demand for BLC access has increased even more since then. Our continued growth will further exacerbate this problem. We need to consider both short-term and long-term sustainable solutions, from simple fixes (moving the printer off the bench and adding small sturdy tables to increase usable space) to repurposing other spaces or considering instructional assistants who can help keep the BLC and other student learning spaces open for more hours of access. Another option to alleviate demands on the prep staff is to dedicate student assistant or work study students to handle simple requests from BLC students such as refills of non-chemical supplies and retrieving and storing anatomy models.

To support PLOs and SLOs related to independent research projects and papers, students need access to our library scientific databases, specialized reference encyclopedias, ebooks, collections developed with assignments in mind, etc. If these types of resources are not available, students will be severely handicapped in their ability to complete projects and papers and therefore will not be able to meet their PLOs and SLOs.

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

Program Plans:

1) Since our last Program Review update we have added a net of six sections, all with labs. This has led to a need for new faculty and an increased budget to support the monetary requirements of

offering additional labs; both of which are our top priorities.

a) It is clear we need two full-time faculty hires to share primary responsibility for Bio 30, our foundational entry-level course. Only 4 of 28 sections of BIO 30 are being taught by a full-time faculty. This is class that has a high turnover of part-time faculty. BIO 30 is often the first biology class students take at LPC. It has a student high attrition rate, and students would benefit from faculty members who have more office hour availability, mentoring and advising. If students are successful in BIO 30 they are more likely to complete the biology sequence and continue their education at Las Positas.

b) As our program grows, we need to increase our program supply budget appropriately. We have been very creative in stretching our current funds and have considerable changes to labs however this is not sustainable especially considering future growth.

c) Our department participates in the Honors Program and supports independent study projects. The associated costs must be built into the budget.

2) We have begun initial work to create Transfer Degrees and will continue working closely with the Curriculum committee to interpret the state mandates and make the appropriate decisions for our degrees.

3) We have poor efficiency in the lab for checking out materials to our students. Inventory is completely done by hand now, and students have to write their name, W, phone, signature, etc. on a spreadsheet that is kept in the lab. This is very time consuming and takes half of a lab period to check out field guides, insect nets, binoculars, etc.

We want to explore a scan-able system for checking out materials, using bar codes. This would be for materials, like reference books, insect kits, nets, etc. for students all semester to use for their work. This is discussed in our Program Snapshot and SLO A1.

4) We plan to install a carbon dioxide delivery system with tank and manifold so that we can have carbon dioxide delivered to student work-stations. Currently, students buy Alka Seltzer in bulk so that they can conduct their genetics experiment. This is prohibitively expensive for students.

5) With the resignation of a lab technician, the job search for a replacement is on-going; however the first round was not successful and the deadline for applications was extended. We cannot emphasis enough how urgent and important getting this position filled is for our biology and chemistry classes to operate. This is a top priority.

6) We have submitted the funding request to acquire a second cadaver and tentatively planning on its arrival in January 2016.

7) We continue to recommend that HR continually post that we are looking to create a pool of adjunct Bio faulty to draw from.

8) We want to reinforce the collaborative nature of our intra-departmental interactions (FT and PT, faculty and staff, staff to staff). We would like to hold all-faculty members to encourage our PT faculty to attend joint meetings with FT faculty. Through these, we hope to involve all faculty in discussion of best practices and meaningful discussion of pedagogy. We have, in the past, held meetings jointly with faculty and technicians, and would like to bring this team-reinforcing activity back. The technicians also hold staff meetings.

9) We have taken BIO 60 out of the spring 2016 schedule due to low enrollments with the understanding that we would offer it once a year in the future. For 2016-17, this class should be

offered in the spring semester because there are more field trip opportunities and this class has consistently participated in the spring Undergraduate Science Research Poster session. BIO 60 is often the only general education class that participates in this program. We want to encourage their participation.

10) We plan to submit an IER to purchase microscopes for students and instructors, as well as, hardware and software to capture microscopic images. This is discussed further in our program update and SLO section. We also need to purchase student learning supplies and equipment, such as class sets of binoculars and insect nets, to meet the needs of additional sections.

11) We plan to implement and further explore short-term and long-term solutions to overcrowding in the BLC. These include simple fixes (e.g., moving the printer off the bench and adding small sturdy tables to increase usable space) to more involved fixes (e.g., repurposing other spaces, adding instructional assistants and work study students).

12) We plan to add more sections of Bio 7A and Bio 7B to meet student demand. We also plan to explore options for increasing enrollment in our GE lecture-only classes.

13) We plan to hire a FT biology faculty starting Fall 2016 as approved by FHPC, senate, and the president. We will repeat our request for a second position for a new biology faculty to start in Fall 2017. Both of these are required because we continue to add more than one FTEF in courses to our schedule each year.

E. Do plans listed under question (D) connect to this year's planning priorities (listed below)? If so, explain how they connect.

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.***

Program Plan #1a is connected to the Planning Priority ***"****Establish regular and ongoing processes to implement best practices to meet ACCJC standards." ACCJC Standard IIIA7 outlines the importance of the institution maintaining a sufficient number qualified faculty to assure the quality of education and educational purposes.*

Program Plan #1a is connected to the all the Planning Priority as a full-time is instrumental in best practices to meet ACCJC standards, curriculum development, meaningful SLO development and assessment, and utilizing tutoring serves through extensive office hours, mentoring and advising.

Program Plan #1b is connected to the Planning Priority ***"****Establish regular and ongoing processes to implement best practices to meet ACCJC standards"* ACCJC Standard IIID4 outlines fiscal responsibility and stability which applies to our program supply budget. We are continually grateful for the support from the College.

Program Plan #2, #13 is connected the Planning Priority ***"****Provide necessary institutional support for curriculum development and maintenance".* We will need the continued support and guidance from the Curriculum Committee. The new FT faculty members will have primary responsibility for curriculum development of the introductory biology courses (e.g., BIO 10, BIO 30).

Program Plan #5 is connected to the Planning Priority ***"****Provide necessary institutional support for curriculum development and maintenance"* as coordination with lab technicians is essential to help implement new curriculum changes involving labs.

Program Plan #4, #6 and #10 are connected to the Planning Priority ***"****Develop processes to facilitate ongoing meaningful assessment of SLOs and integrate assessment of SLOs into college processes"* as it will allow more meaningful assessment of anatomical relationships in support of the BIO 7A SLOs and supports SLOs and PLOs in microscopy and independent research projects across multiple classes.

Program Plan #11 is connect to the Planning Priority "Expand tutoring services to meet demand and support student success in Basic Skills, CTE and Transfer courses". The Biology Learning Center is a major resource for student success. Students work together to prepare for exams, meet with faculty and peers, and conduct out-of-class lab work that is required for living organisms such as bacteria and fruit flies used for genetic studies.

F. Instructional programs: Did your program meet its program-set standard for successful course completion? ____yes _____no SEE BELOW

(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.

All rubrics formerly called BIOL, BOTN, ANAT, MICRO, PHSI, ZOOL, met the Program Set Standard, however ECOL did not. This is an improvement as last academic year BOTN and PHSI, in addition to ECOL did not meet the Program Set Standard. We believe this improvement is due to all sections of Botany and Physiology being taught by full-time faculty unlike the previous year.

We think the low success rates in Ecology 10 (now BIO 40) may be attributed to the fact that this course primarily serves non-science freshman who do not received the more individualized attention and instructor coaching as is provided in our lab courses. Combined with this, enrollment numbers fluctuate significantly; therefore we are exploring other variables.

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

By changing the program rubric, students have been able to find all of our courses listed in one centralized place in Course Catalogs, Class-Web, Class Schedules, etc. The rubric change has made data analysis more effective; therefore, students benefit from enhanced data-based planning and decision-making in the program.

Student engagement has continued to be a major focus in our department. The Biology Club continues to be among the most active of student organizations, holding 40-50 events each semester. The program has installed a chapter of Beta Beta Beta, a national biological honors society. The members attended a district convention, taking home awards. Both student organizations initiated and worked together to offer a campus-wide Ted-like talk.

The Biology program, along with other science and math disciplines, collaborated with the AAUW to create a mentoring program between female science students and professional scientists in the community.

Our full-time faculty members continue to do honors contracts and independent study contracts with

students.

By adding more sections, including evening and summer sections, we have been able to better meet student demand in support of completion goals.

One downside to growing our program is its impact (heavy use) on equipment, facilities and supplies. For example, our most comprehensive department-wide SLO relates to student mastery of microscopy. Recently, we have heard from our students that there are no longer enough microscopes for them to use during peak hours in the Biology Learning Center (BLC) and biology labs. Additionally, intense usage by an increasing number of students in the BLC and all biology labs, have resulted in more maintenance and repair problems. This takes some microscopes out of circulation for student use. We now have a greater need for microscopes in the BLC. Moreover, students do not always have access to the same type of microscope used for their SLO assessment.

Students in the anatomy lab (which serves all BIO 7a – Anatomy and BIO 50 – Human Anatomy & Physiology) are working with microscopes that are over 20 years old. These microscopes show their wear and tear, do not focus well and have optics that are not optimal for viewing histology. Tissue histology is a major focus of SLOs in anatomy.

We are working with a vendor who supplied our microscopes in 2012 to give us a quote for replacing our 20+ year old microscopes in the BLC and the anatomy lab.

Currently, students in the labs take micrographs on existing instructor scopes and send those images to a central computer in the Biology Learning Center (BLC). This is no longer sustainable because the BLC is overcrowded and we cannot set aside a computer and microscope in the BLC for work that needs to be done in the biology labs. We have worked with IT and with a microscope vendor to develop a solution. New instructor microscopes and imaging hardware and software will allow students and faculty to capture microscopic images from the classroom. These images support SLOs of individual labs.

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.

In spring 2015 BIO 7A students performed highly on the SLO requiring muscle identification. This indicated to the instructor that the students had high understanding in this area.

Students in BIO 30 sections consistently perform well on the microscope SLO indicating that students have mastery of microscope use and care.

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

In several past semesters of BIO 7B physiology students performed poorly on the math SLO, which was assessed in the form of a math quiz.

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.

In spring 2015 the BIO 7B instructor implemented more concept-based math skills to improve their understanding, which was then reflected in higher quiz scores.

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.

NA

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*.)

Both BIO 20 and BIO 40 have been assessed at least once every two years. However, the last time we assessed both DE and in-class BIO 40 was Spring 2012. In BIO 20, we have five semesters of in-class data but no comparable DE data.

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.

NA

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

Instructors want to create additional SLOs to collect data on areas they have seen patterns in but do not have empirical evidence to support. Use of SLO assessment data will then help instructors make data-based decisions regarding appropriate equipment, teaching pedagogy, service hours, etc.

For example, our Botany instructor has observed her students struggling with Fast Plant Project and has speculated this is due lack of appropriate equipment and space. She would like to gather data on this student success pattern.

Similarly our Anatomy instructor has noticed inconsistent performance on anatomical exams and quizzes. She speculates that the students who have the most hands-on study time in the Biology Learning Center (BLC) perform higher on tests. She would like to develop SLOs that assess if hands-on BLC hours equate to higher exam and quiz scores.

We already have PLOs and SLOs related to independent research projects and papers. Student success in these outcomes are dependent on access to rich library resources and collections. Students need access to our library scientific databases, specialized reference encyclopedias, ebooks, collections developed with assignments in mind, etc. If these type of resources are not available, students will be severely handicapped in their ability to complete projects and papers and therefore will not be able to meet their PLOs and SLOs.

Our most comprehensive department-wide SLO relates to student mastery of microscopy. Recently, we have heard from our students that there are no longer enough microscopes for them to use during peak hours in the Biology Learning Center (BLC) and biology labs. Additionally, intense usage by an increasing number of students in the BLC and all biology labs, have resulted in more maintenance and repair problems. This takes some microscopes out of circulation for student use. We now have a greater need for microscopes in the BLC. Moreover, students do not always have access to the same type

of microscope used for their SLO assessment. Students in the anatomy lab (which serves all BIO 7a – Anatomy and BIO 50 – Human Anatomy & Physiology) are working with microscopes that are over 20 years old. These microscopes show their wear and tear, do not focus well and have optics that are not optimal for viewing histology. Tissue histology is a major focus of SLOs in anatomy. We are working with a vendor who supplied our microscopes in 2012 to give us a quote for replacing our 20+ year old microscopes in the BLC and the anatomy lab. Currently, students in the labs take micrographs on existing instructor scopes and send those images to a central computer in the Biology Learning Center (BLC). This is no longer sustainable because the BLC is overcrowded and we cannot set aside a computer and microscope in the BLC for work that needs to be done in the biology labs. We have worked with IT and with a microscope vendor to develop a solution. New instructor microscopes and imaging hardware and software will allow students and faculty to capture microscopic images from the classroom. These images support SLOs of individual labs. Students in BIO 1B (Zoology) are assessed on an insect collection as one of their SLOs. We do not have enough nets for students to use for their project and require a cumbersome and labor intensive check-out process for borrowing nets. This cumbersome process is also used for other equipment. With the addition of more sections of zoology, this situation has been exacerbated. We need to purchase more insect nets to allow for student access and need to purchase and implement an efficient bar-code scanning system for the check-out process.

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

If yes, complete the table below:

Estimated number of courses for which SLOs will be written or revised:	2-3
Estimated number of SAOs that will be written or revised:	

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

n/a

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	16
Spring 2016	16