

Name of Program	Division	Author(s)
Biology	STEMPS	Carbone, Hight, Ho, Shuldman, Zingg

### INSTRUCTIONS:

1. This Program Planning Update covers the academic years 2012-2013 and 2013-2014.
2. The planning should be for the academic year 2015-2016.
3. Use the Save As feature in Word to save this template with your program name, so that you do not overwrite the original template. Please use your program’s catalog rubric and this format when naming your document:

Rubric INS PPU 15\_16  
e.g., ESL INS PPU 15\_16

4. If the document displays in large type with only File, Tools, and View tabs at the top of the page, select **View, Edit Document**. You will then be able to type where it says “Click here to enter text” and you will be able to click on the check boxes to select them.
  5. In each section, click in the box under the instructions and fill in your information. The box will expand as you type. If a section is not pertinent to your program enter N/A in the box; do not leave it blank.
  6. When you have completed the form, run the spell-checker (**click inside the text in the first box**, then click on the Review tab and find Spell-Check in the far left corner of the ribbon).
  7. Please address your questions to your Program Review Committee representatives or the PR Chair Karin Spirn. Concerns, feedback and suggestions are welcome at any time to PRC representatives or co-chairs.
  8. Instructions for submitting your Program Planning Update will be available at the start of the fall semester.
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## I. STUDENT LEARNING OUTCOMES

### Review of academic years 2012-13 and 2013-14

#### A. SLO Assessment Review

Review your program’s SLO assessment results through spring 2014 and respond to the following questions.

1. Discuss how assessment results indicate success in student learning. Identify results that indicate a need for improvement.

All courses except one (Ecol 10) have assessed SLOs at least once within the required 2-year period. After reviewing the data for the last two academic years, the consistency and frequency of assessing SLOs appears to be correlated with whether a full-time faculty was assigned to the course although some of our adjuncts contribute by assessing course SLOs. For example, Bio 5 and 10 which are taught exclusively by adjunct faculty, have been assessed but not frequently enough to generate sufficient data for meaningful review. Ecology is due to be assessed this year; however it is being taught by an adjunct faculty. We have already identified this course in an email to this person and have offered assistance and referral to possible compensation. The full-time faculty highly encourage and offer support to

adjunct faculty through the SLO process.

The Microscope SLO assessed in most of our biology lab classes has consistently high competency scores which we believe indicates proficiency in this core lab skill. Specifically, Zoology 1 and Biology 1 students consistently do well on this SLO. This is partially a result of having clear SLOs and the development of a rubric that students find easy to understand. As a result of assessing this SLO, there has also been decrease in microscopic damage. Further, when students take Microbiology, the instructor witnessed more independence and proficiency in microscope use since assessing the Microscope SLO. This allows the students to focus on the task-at-hand such as accurately diagnosing bacterial specimens.

Physiology students consistently demonstrate proficiency in blood pressure comprehension and calculation as demonstrated through assessment of the Blood Pressure SLO.

The Insect Collection SLO in Zoology shows continued success. This year, former successful students were brought in during the introduction of the project to help increase peer-to-peer advice.

Our program-level SLO of students being proficient in standard laboratory techniques has been assessed in Biology 1 where students show outstanding success with their exposure and development of laboratory techniques. Further this reflects on the commitment by the department and the College to provide students access to high-quality, well-maintained modern equipment and instruments with extensive hands-on experience in developing experimental techniques and skills.

2. Discuss how distance education courses assessment results compare to face-to-face courses, if applicable? (*Respond to this question if your program has distance education courses.*)

We have offer two distance education courses; Biology 20 and Ecology 10. Ecology 10 is our one course that had not been assessed. Both of our DE courses are taught by adjunct faculty and have historically small classes (is this what you mean by sample size?). However, the adjunct faculty teaching Ecology this semester has been contacted, encouraged and offered a stipend for assessing the SLO.

3. Discuss how your discipline, or someone in your discipline, made changes in pedagogy as a result of SLO assessment results.

Microbiology pedagogy has been re-structured to have more individual instruction and assessment on the microcope SLO; this has lead to a significant reduction in the issues of improper microscope use and therefore less microscope damage. Both Zoology and Bio 1 have also increased the number of assessments and opportunities for review during lab time to master this SLO.

Zoology has implemented teams of former students to help roll-out the insect collection to support the SLO for this project. This mirrors a highly-successful model from Bio 1 for the

genetics project.

4. Give an example of a change in the number of units and/or lab hours based on assessment data, if applicable.

Not applicable.

5. Did your program discover the need for additional resources (for AY 2015-16) based on the assessment results? YES  NO

If yes, please explain.

Click here to enter text.

### B. SLO Process

1. Describe how your program reaches consensus when writing student learning outcomes that are used in multiple sections.

My program offers only one section of each course.

If there is more than one faculty teaching sections of a course, they will discuss the creation of new SLOs if deemed appropriate. For example, the two full-time physiology instructors have created several new SLOs to assess students' competency in math and chemistry. We have previously held SLO workshops for adjunct faculty using Foundation grants, but we no longer have this resource.

2. Describe how your program reaches consensus when developing and evaluating assessment results for student learning outcomes that are used in multiple sections.

My program offers only one section of each course.

If there is more than one faculty teaching sections of a course, they will discuss SLO assessment results and if they indicate the necessity for potential changes to pedagogy, curriculum etc. We have previously held SLO workshops for adjunct faculty using Foundation grants, but we no longer have this resource.

3. What methods does your program use for documenting SLO related discussions? Check all that apply.

Program emails

Program meeting minutes/agendas

Blackboard/other website

Other (please describe):

[Click here to enter text.](#)

## II. PROGRAM ANALYSIS

Review of academic years 2012-13 and 2013-14

Review the student data provided by the Office of Institutional Research and any additional data your program has collected. Then respond to the sections below.

### A. Data Review

If applicable, summarize any **changes** in your program's data since the Annual Program Review of 2011-12 or observed significant trends that will affect program planning or resource requests.

**NOTE:** Only include changes that affect student learning, program planning or resource requests.

The below observations of data changes are organized by program rubrics. Where possible we describe how these changes are connected to student learning, program planning and resource requests. However, we also have recorded changes that we cannot currently link to learning and planning, but thought were interesting and worth keeping an eye on for future reference.

#### I. Zoology:

- 1) A decrease in full time students- this may because biology students have a hard time getting into required classes.
- 2) An increase in transfer as students' goal
- 3) An increase in success rates in spring, possibly because the instructor spent more classroom time on the Ethology reports

#### II. Physiology

- 1) An increase in younger students <30years
- 2) A decrease in older students > 30years
- 3) An increase in transfer goals of students.
- 4) Inconsistent success rates between semesters reflect different teaching standards between full-time and part-time faculty
- 5) >100% fill rate (usually around 112%) may be correlated to low success rates when compared to other biology classes. After examining this data, full-time faculty have agreed to reduce the amount of over-enrollment in this class.

#### III. Microbiology

- 1) Some increase in returning students
- 2) Big increase in students transferring to LPC from other CCs.
- 3) In the last 2 years the data shows a decrease in the number of courses students are taking concurrently. This is probably due to an increase in full-time faculty advising students against taking Microbiology and Physiology concurrently.
- 4) Inconsistent success rates between semesters reflects different teaching standards between full-time and part-time faculty

#### IV. Ecology

1) Average completion rates are high, yet average success rates are low for this course. We are not sure why.

2) There is a high level of variability in the success rates between semesters taught by different instructors. There is high variability, yet no consistency, observed in the success rates between DE and classroom Ecology courses. This suggests that we may want to look into instructional norming and standardization for this course.

#### IIV. Botany

1) High variability in success rates between semesters. We were unable to determine what this was due to but want to record it and re-analyze it in the future

V. Biology- this rubric contains a range of classes for majors and non-majors, those with and without labs. Therefore capturing data trends is difficult without the request of more data studies which we have previously done through the Office of Institutional Research.

1) One trend that did jump out to us is the high productivity rates. For example in Spring 2014 WSCH/FTEF was 621.5

2) Also in Spring 2014, only 7% of all Biology classes were taught by full-time faculty and all 4 full-time faculty were teaching full loads or overloads. Clearly our core Biology classes need more full-time faculty for consistency of instruction, departmental leadership and student mentoring/advising. We just finally filled two long-unfilled biology positions in the last two years, so will not go out for another position out of respect for other programs who have similar, pressing needs for restoring departments due to retirements or for growth.

#### VI. Anatomy

1) An increase in Latino students seen over the last three years

2) Higher percent of full-time students than other pre-nursing classes. This could be because Anatomy is somewhat less challenging than Microbiology or Physiology. All three courses are required for the pre-nursing pathway.

3) Higher percent of students with occupational degrees than other pre-nursing classes. This could be because Surg Tech students need to take Anatomy but not Physiology or Microbiology.

4) We discovered a miscalculation of the Anatomy FTEF data therefore making the reported WSCH data incorrect as well.

5) With the hiring of a full-time Anatomy instructor we have seen success rates increase along with fill rates. Clearly, the college made a good decision in hiring this instructor.

### **B. Program-Set Standard for Successful Course Completion Rates**

Your program-set standard for successful course completion rates (i.e., number of grades of 'A', 'B', 'C', 'CR', and 'P' divided by total grades) is calculated by averaging successful course completion rates for your program over a five-year period and then multiplying that result by 95%.

In order to determine if you have achieved your program-set standard for successful course completion rates for a given year (e.g., 2012-13), you will need to assess if your program met or

exceeded 95% of the previous 5-year average (i.e., 2007-08 through 2011-12) for your program; these calculations are done for you (*see links below*).

1. What was your program-set standard for successful course completion rates in 2012-13 and 2013-14?

	<b>Program-Set Standard for successful course completion</b>	<b>Did you meet your program-set standard? (Yes or No)</b>
2012-13	<a href="http://tinyurl.com/mmfwgfe">http://tinyurl.com/mmfwgfe</a>	
2013-14	<a href="http://tinyurl.com/q6dah55">http://tinyurl.com/q6dah55</a>	

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

Most rubrics (Anat, Bio, Micro, Zoo) met standards for both years under review. The exceptions were Ecol 10 and Botany in 2012-2013 and Physio in 2013-2014. Ecology was likely reduced because we had to reduce our offerings by 1 full class and the remaining classes were weighted toward on-line students. The Botany class was severely impacted by the lack of a full-time faculty member; we believe that this year's addition of a new full-time member to our department who focuses on Botany will address this standard. This is also seen in the closeness of the Botany success rate in 2013-2014, which was lower than previously, though still within the standard. We believe the decrease for success rates for Physiology are due to it now being taught by full-time faculty who have more consistently-applied standards across sections.

**C. Curriculum Review**

1. Review your program's current curriculum. If applicable, describe any internal or external impacts which will affect your curriculum plans for 2015-16.

We need to do C-ID for all courses that have C-ID already developed. Several course outlines need to be revised. We can not build our transfer degrees until the degrees are developed at the state level.

**D. Human Resources**

1. Have there been changes in the number of full-time or part-time faculty associated with your program since the Annual Program Review of 2011-12? If yes, briefly describe the changes.

We are pleased that we have finally hired the two full-time faculty we requested through the FHPC process: Anatomy and Biology/Plant Sciences.

2. Have there been changes in the number of full-time or part-time classified staff associated with your program since the Annual Program Review of 2011-12? If yes, briefly describe the changes.

We have added one full-time lab technician through the Classified Staff Position request process.

3. If applicable, describe how the changes indicated in 1 and 2 have impacted student learning?

These new hires, have been, and continue to be, essential for developing our Anatomy/pre-nursing and Plant Science/majors programs. The cadaver room is fully functional thanks to the new full-time Anatomy faculty, and we expect the greenhouse, herbarium, and planting areas to become integrated more effectively throughout our entire program.

#### **E. Other information pertinent to the program**

Click here to enter text.

### **III. PLANNING**

#### **A. Planning Update**

Summarize your program's plans, initiatives, and objectives accomplished since the Annual Program Review of AY 2011-12 (include accomplishments for the academic years 2012-13 and 2013-14).

We hired two full-time faculty members and a classified lab technician (shared with chemistry); acquired a cadaver and funding to support the cadaver facility; continued to acquire, maintain, repair, and replace instructional equipment; sought and received funding for more biotechnology incorporation; and added sections of Zoo, Bot, and Bio 50.

#### **B. Program Planning for AY 2015-16**

As appropriate for your program, please address each of the following areas. For each area, describe your program's plans, initiatives, and objectives for the academic year 2015-16. Focus on how planning will impact student learning or the student experience at Las Positas College.

1. SLO assessments. NOTE: 100% of courses in your disciplines should be assessed a minimum of once every two years. As a guideline, each program should be assessing 25% of its courses every semester.
  - a. How does your program plan to use assessment results for the continuous improvement of student learning? Examples might include (Your responses may vary.):
    - changing number of units/lab hours
    - changing pedagogy/curriculum
    - changing assessments

We will encourage faculty to assess more than one SLO per course, if applicable, especially for our program-wide SLO. We will do this through reminders and possible

workshops with adjunct faculty.

We continually use results from tests, exams, quizzes, projects, SLO assessments, student feedback and teacher evaluations to modify teaching pedagogy and curriculum. We plan to use SLO assessment results to collect data on students' math and chemistry competency in several biology courses. We will focus our efforts on courses that require basic math and chemistry skills which students struggle with in their biological application. This data may potentially be used to change curriculum pre-requisites.

- b. Have your assessment results shown a need for new SLOs? YES  NO

If yes, in the table below, state the number of courses in your program and estimate the percentage of courses for which your program will write new SLOs.

Number of Courses	Estimated Percentage for which new SLOs will be written
12	8% for new Anatomy SLOs in development (Anatomy is 1 out of 12 biology classes)

- c. What percentage of courses will your program assess in the next academic year (2015-16)?

We plan to assess 100% of our courses at least every two years, so we anticipate 50% will be assessed in 2015-2016 with the other 50% being assessed in 2016-2017..

- d. 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 and the percentage of them who are likely to participate in the SLO process in 2015-16.

Estimated Number of Part-time faculty	Estimated Percentage who will participate in the SLO process
11	We hope to encourage at least 50% of our adjunct faculty to participate.

#### 4. Curriculum

- a. Considering the criteria of relevance, appropriateness, achievement of course objectives, currency, and future needs and plans, will your program be making any changes to **existing** curriculum to address any of these criteria? If yes, please describe the changes and your program's reasons for the changes. Please provide any data which supports your program's reasons for the changes to your curriculum. Include a discussion of how the changes will improve student learning.

Yes, we plan to create C-IDs and appropriate transfer degree(s) because of state mandates. We can do this for only a few courses at present, and the degree is not ready at the state level. We are uncertain how this will affect student learning.

Biology and Microbiology are fast moving fields with new technologies and novel methods constantly being invented. To stay on top of this, we regularly reevaluate and



update our curriculum, then adapt equipment and techniques to the new state-of-the-art. This will help prepare students enter the work force or transfer to higher degree institutions. We propose to include the following three important developments to revitalize our curriculum:

1. Tissue culture applications are widely used in the fields of cell biology, plant science, and medical microbiology. This technology is used for diagnostics as well as research in cytogenetic, biochemical, and molecular biology laboratories. Our goal is to obtain a tissue culture hood and an inverted phase contrast microscope for sterile, *in vitro* propagation of plant and animal cells.
2. UV-Vis spectrophotometers and fluorospectrometers designed for use in biology have fundamentally changed DNA, RNA and protein analysis. The NanoDrop technology enables the measurement of nucleic acid concentrations in extremely small sample volumes, e.g., one microliter. This would greatly improve several of our experiments and will reduce the volume of costly reagents. Our goal is to obtain two NanoDrop UV-Vis spectrophotometers and one NanoDrop fluorospectrometer for use in many of our biology courses, such as BIOL 1, MCIR 1, PHSI 1, BOTN 1 and others.
3. Synthetic Biology is an exciting emerging area of biology that combines such disciplines as biotechnology, microbiology, evolutionary biology, molecular biology and systems biology. It deals with the design and construction of novel artificial biological pathways, organisms, or devices. This technology is rapidly becoming a part of many areas, including medical research and biofuel production. Our goal is to introduce synthetic biology experiments into our more advanced biology courses, such as BIOL 1, MICR 1, and BOTN 1.

- b. Will new curriculum be submitted to the Curriculum Committee for the academic year 2015-2016? If yes, please describe briefly what new curriculum is planned and the rationale for the new curriculum. Please provide any data which supports your reasons for the new curriculum. Include a discussion of how the changes will improve student learning.

Likely; we have been approved for a rubric change for all of the current biological sciences to be combined into a single rubric (BIO), effective in Fall 2015. This will make it easier for students to find our courses (e.g., Class-Web, catalog, schedule) and to analyze program data. For example, program review analysis requires us to access files and data (e.g., SLOs, program-set standards, success rates, etc.) for all current rubrics (ANAT, BIOL, BOTN, ECOL, MICR, PHSI, ZOOL), yet there is no easy way to compare data across our entire biology program. No new courses will be submitted.

## 5. General Program Planning

Use this area to describe any program plans, initiative, or objectives your program wishes to accomplish in 2015-16 and their impact on student learning or the student experience. Focus on what the plans are and how they are to be accomplished (not resources needed).

We would like to add more sections of courses, especially impacted ones with high numbers of waitlisted students (Anat 1, Bio 31, Zool). We attempted to implement the first late-start Anatomy class fall 2014. This experiment was incentivized by consistently long waitlists in Anatomy and the District's encouragement to boost FTES through adding late-start courses. Unfortunately, due to late announcements and the fact that students who could have taken this class may have already moved to another college, the class enrollment was too low to continue.

Currently our full-time Anatomy instructor has provided an independent study program for student dissectors. In fall 2014, 32 students applied for 8 positions. We would like to meet student demand for this learning opportunity and are in the formative stages of how to address this need. We plan to discuss this more in departmental meetings, with the Dean and appropriate committees (eg: curriculum, facilities, RAC, etc)

This year we will complete any C-IDs and transfer degrees as mandated by the state. No degrees are yet completed, so we will not submit a degree, but we will continue to monitor the situation. Multiple course outlines will be revised, including those that already have C-ID. We have already made arrangements to compensate two adjunct faculty for updating Course Outlines in courses solely taught by adjunct.

#### IV. Resource Requests for AY2015-16

Complete all areas that apply to your program's resource needs for 2015-16 (**not all areas apply to all programs**).

For each request, in the rationale section:

- Describe how meeting this request will improve student learning or the student experience.
- Provide any data or evidence which supports this request.

##### A. Enrollment Management

1. Request: New FTEF. Indicate amount being requested.

1.0 to 1.5

2. Rationale for request(s).

To support the increase in the number of sections of courses listed above in III 5.

##### C. Human Resources

1. Request: New or replacement faculty position(s).

none

2. Rationale for faculty position request(s).

n/a

3. Request: Classified staff position(s) (for example, new or replacement classified staff position(s) or increasing classified hours/position level).

none

4. Rationale for classified staff position request(s).

n/a

#### D. Financial

1. Request: Maintenance of, or increase in, existing program budget (e.g., for supplies, etc.).

Increase in existing program budget

2. Rationale for financial request(s).

The Biology operating supply budget has decreased over the last 9 years from a high of \$29,000 with a separate Microbiology budget to a level today of \$26,000 including Microbiology. Meanwhile prices for the same supplies have increased every year during those 9 years as have transportation costs, hazard materials fees, handling fees (ice, packing) in getting those supplies here. In addition, the Consumer Price Index for the price for goods has increased 19.7% over the last 9 years.

The decrease in buying power (-19.7%) coupled with the decrease in the supply budget (\$3,000) severely affected our program. From a high of \$29,000 budget 9 years ago we are now operating with an effective supply budget today of \$20,878. Compounding this budget constraint we have doubled the number of majors sections which are particularly supply-intensive class. We have covered some of these costs by dramatically reducing or eliminating labs activities and reducing student ratios-to-supplies in many classes.

Fortunately, we have been able to secure CTE funding through the hard work and efforts of our faculty to cover some supply costs, but this is not a sustainable solution. We must have a sustainable budget. In collaboration with chemistry department, we envision a mechanism to fund the honor's projects, and the Dean has responded with a generous allocation of \$500. We will be meeting with full-time Bio and Chem faculty and with the staff to develop policies and

rules about the use of these funds.

**E. Technology (software only – discuss hardware in section E)**

1. Request: Upgrade existing software or purchase new software.

none

2. Rationale for technology request(s).

n/a

**F. Facilities, Equipment (include technology hardware), and Supplies**

1. Request: Renovation or upgrade of existing facilities or new facilities.

To create an Anatomy Learning Center for open lab time.

2. Rationale for facilities request(s).

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 dedicated 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.

3. Request: Upgrading of existing equipment or purchase of new equipment.

One tissue culture hood and inverted phase contrast microscope for sterile, *in vitro* propagation of plant and animal cells.

Two NanoDrop UV-Vis spectrophotometers and one NanoDrop fluorospectrometers.

4. Rationale for equipment request(s).

Biology and Microbiology are fast moving fields with new technologies and novel methods constantly being invented. To stay on top of this, we regularly reevaluate and accordingly update our equipment and techniques to the new state-of-the-art. This will increase student

success as they prepare to enter the work force or transfer to higher degree institutions.  
For more details see also III. PLANNING / 4. Curriculum / a.

5. Request: New supplies

We need to have consumable supplies to meet the needs of additional sections and new instruments and technologies, such as RT-PCR and synthetic biology experiments.

6. Rationale for supplies request(s).

Supplies must be replenished.