

## Program Review: Biology

### Program Description and Scope:

- *Program Review Title:* Biology
- *Academic year:* 2016/2017
- *Review Type:* Instructional Disciplines
- *Program/Departments:* Biology (04000)
- *Authority Code:* 44-Dean, Science, Engineering, and Mathematics
- *External Regulations:* No
- *Provide a brief narrative that describes the instructional program/discipline:*  
The Biology Program is designed to promote student success in subsequent educational programs they wish to enter and to instill in students an interest in biology. Some students within our program intend to transfer to a four year degree programs in biology, while other students have a goal to complete a vocational health sciences program, such as nursing, dental hygiene, physical or respiratory therapy programs, pharmacy or physician assistant programs. Finally, some students in our program are taking our courses as a general education requirement. The Biology Transfer Program offers a regimen of science courses equivalent in content and quality to the core freshman or sophomore science courses for biology majors at four year institutions. The Allied Health sciences students are completing prerequisite courses required to apply to health science programs. Although the majority of students in the program are intending to pursue a career in biology or health sciences, we also offer courses that fulfill general education requirements and/or personal interest.

### College Mission:

- *Mission Statement:*  
Ohlone College responds to the educational needs of our diverse community and economy by offering high quality instruction supporting basic skills, career development, university transfer, and personal enrichment and by awarding associate degrees and certificates to eligible students in an innovative, multicultural environment where successful learning and achievement are highly valued, supported, and continually assessed.
- *Program Relation to College Mission:*
  - Career Entry (CTE)
  - University Transfer
- *State Your Program Mission/Purpose:*  
The Biological Sciences program addresses two key parts of the college mission: successful transfer of students to four year institutions and entry into health science professional programs. Additionally our program offers a number of general education classes that meet the mission of personal enrichment. Additionally the program is designed to support a diverse group of students in meeting high academic and professional standards through a setting where

innovative thinking is rewarded. This is accomplished by traditional instruction, group and individual projects and hands on laboratories.

o *Briefly Describe Program Accomplishments:*

.The Biology Program provides a variety of pathways fashioned to meet a range of career goals. The program offers sequences of courses that fulfill lower division requirements for most biology programs at UC and SCU for students that are intending to transfer to a four year biology degree program. Students completing the proper sequence may obtain an Associate of Science degree in Biology. Recently, the Biology Program has developed a Transfer AS degree specialized for students transferring into a CSU. We are awaiting state approval for the latter degree. An Allied Health Science certificate may be earned by students applying for vocational health science programs such as nursing, physical therapy, physician assistant and dental hygiene. Additionally, the Biology Program offers several other Certificates of Accomplishment aimed at various biological sub-disciplines.

## Achievement and Resource Data Analysis:

*Research Questions:*

1. Success rates overall are below the college-set minimum of 70.0%. What can be done to address the reasons for these low success rates?
2. The overall success rates for students in BIOL-103A and BIOL-130 are below the college set minimum of 70.0%. Is there something that can be done as a part of the PIO process to address these low success rates?
3. There is one group of students whose success rates indicate a disproportionate impact. What can be done as a part of the PIO process to discover and address the learning needs of this group?

• **Resource Assessment Summary:**

1. *Academic Year:* 2013-14
2. *Activity Center Fund 10 Budget Allocation:* \$750355.60
3. *FTEs:* Fall: 176 Spring: 157 Summer: 0
4. *WSCH/FTEF:* Fall: 695 Spring: 687 Summer: 0
5. *Course Sections Offered:* Fall: 33 Spring: 31 Summer: 0
6. *Sections Taught FT Faculty:* Fall: 22 Spring: 21 Summer: 0
7. *Sections Taught PT Faculty:* Fall: 11 Spring: 10 Summer: 0

• **Human Resources:**

1. *# of FT Faculty:* 5
2. *# of PT Faculty:* 8
3. *# of Classified Staff:*
4. *# of Administrators:*
5. *% Faculty release/reassigned time:*
6. *Technology:*
  - Specialized Software

- Technology Enhanced Instructional Equipment
- Laptops

7. *Physical Resources:*

- General Classrooms
- Specialized Labs

• Program Analysis PSLOs - Student Learning:

(Key: I-Introduced, P-Practiced with Feedback, M-Demonstrated at the Mastery Level)

1. *PSLO Matrix:*

Course	PSLO-1	PSLO-2	PSLO-3
BIOL 101A	M	P	P
BIOL 101B	M	M	M
BIOL 103A	M	P	P
BIOL 103B	M	P	P
BIOL 104	I	I	I
BIOL 106	M	M	M
BIOL 107	I	I	I
BIOL 130	I	I	I

2. *Please Indicate the PSLO(s) which you are reporting on:*

- **Critical thinking skills:** Students will demonstrate critical understanding of biological concepts, methods, and applications by applying critical thinking to a variety of biological situations.
- Students will demonstrate the correct operating procedures in the use of lab equipment typical in the biological sciences (for example, compound microscopes, spectrophotometer, pH meter, electrophoresis gel apparatus, micropipetters, and centrifuges)
- Students will demonstrate safe handling of biohazardous materials used and generated in bioscience laboratories.

3. *Analyze and summarize your assessment findings â?? What in the data jumped out?*

1. Overall student success rate has fluctuated between 70.08-66.89%. Efforts to increase student success include the following:

A. Revise curriculum for Biol 130 to target allied health science students and create a new course targeting non-majors. Biol 130 is currently a prerequisite for Biol 103A and Biol 106 as well as a general ed. lab course. See attachment "Proposal-Biol 130 revision" for more details.

B. Include scored online pre-lecture assignments in Biol 101A and Biol 101B to get students to familiarize themselves with lecture topics before class.

2. Success Rates for Biol 103A and 103B are low. Recent changes in the nursing program's admission criteria has increased the number of students who drop Biology 103A with a C or B grade before the withdrawal date. For a fuller

discussion of this situation see the attachment "Biol 103 Retention and Success Issues". Efforts recently implemented include:

- A. Holding an office hour in a lecture room--an effort to replace the now discontinued Biol 131 series discussion classes.
- B. Offering a virtual discussion section using the discussion board on Canvas and awarding students points for participation.
- C. Teaching several sections of Biol 103A as "flipped" lectures.

3. One ethnic group has a low success rate. One proposal to address this is to make use of Ohlone's Early Alert program. Very few of the faculty are familiar with or have been making use of this resource. We plan to meet with counselors engaged in this program in the near future (Spring 2017) to discuss ways we can work together to help all students struggling our classes to better succeed. A second proposal is to make use of embedded tutors in our classes.

4. *Give examples of assessments used for your PSLO analysis:*

Assessment SLO 1-Biology 101. Critical thinking skills were assessed by questions on the final exam for Biology 101B that required these skills. Thirty-five percent of the students had scores between 100-80% on critical thinking problems; 43.4% scored between 79-60%; and 21.6% had scores less than 59%. This is an improvement over the Fall 2013 assessments: +7.5% (100-80% group); +13.4% (79-60% group); and -20.9% (less than 59% group). The main observation here is the decrease in students who do poorly on critical thinking problems (those scoring less than 59%).

Assessment SLO 2-Biology 101A. Students' ability to follow proper operating procedures for microscopes and spectrophotometers was tested in Biol 101A by embedded questions on lab practical exams. Students were given two minutes to properly calibrate the spectrophotometer and measure the absorbance of an unknown substance. 74.4% of those tested on the spectrophotometer performed the procedure correctly, 25.6% did not achieve the desired results. These results are virtually the same as in the previous assessment (73.2% correct and 26.8% incorrect).

As in past assessments, students' ability to set critical illumination on the light microscope was also assessed (both Fall 2015 and Fall 2016). In this assessment, 72.8% executed the procedure correctly; 13.0% knew the proper procedure but executed it incorrectly; and 14.2% did not know the procedure. These results are basically unchanged from the previous assessment performed in the Fall 2013 semester: 77.4% correct; 16.4% knew but did not perform correctly; 6.2% did not know the procedure. Nonetheless, some improvement has been achieved in reducing the number of students who did not remember the correct procedure at all.

Assessments for Biol 104 and Biol 103A, 103B are attached as separate files. Please refer to these files.

- 5. *Describe input from Program Advisory Committee (if applicable):*
- 6. *Comments:*

## Program Improvement Objectives

1. *Based on the program data analysis and PSLO analysis, identify your Program Improvement Objective(s): What are you going to do? Why are you going to do it?*  
Expand and update the computer assisted physiology hardware system presently in use in Anatomy and Physiology and General Biology courses.

*Notes (optional): Please include any notes related to your PIO. (2500 Character limit)*

*Program PIO will address the following:*

- Student Learning & Achievement
- Course Completion
- Increase Degrees/Certifications

*How will you assess the effectiveness of your PIO:*

Practical examination questions that test the students understanding of the proper use of the lab equipment and the data generated by its use. Quizzes and tests will assess the students understanding of the physiological principles.

### **PIO Action Plan:**

*How will you accomplish this?*

Purchase of 24 Powerlab modules and associated physiology equipment. This will both represent a replacement of out of date versions of the same physiology hardware presently used and an expansion of the capabilities of the equipment for an expansion of the course offerings in Anatomy and Physiology and the potential use of this equipment in General Biology. This hardware was purchased more than 10 years ago and it is incompatible with the most recent versions of software for this equipment. In addition, new capabilities of this hardware is only available on the newer systems. Finally, we presently have 8-10 units and this number is too small for pairs of students to work with as the instructor demonstrates the use of the equipment. Curriculum expansion that this PIO will service: Eventually a physiology course could be added to the curriculum and this hardware would be critical to teaching this course. A physiology course would service students that come to Ohlone with the anatomy course completed and have to repeat a full year of anatomy and physiology to complete their health sciences pre-requisite courses.

*What is your timeline?*

The timeline is flexible.

*Who is going to do this?*

Dr. Margaret Kauffman and Dr. Shyam Sundar will primarily be using this hardware in anatomy and physiology. However, Dr. James Baxter had been using a less powerful version of hardware to teach his transfer biology course. Since his

hardware is no longer in use he has been building up labs using the same Powerlab hardware that we would like updated.

*PIO Status:*

- In-Progress
- Revised

*Closing the loop - Describe the results of your PIO implementation or completion:*

As of Nov 2015 12 new power labs have been purchased and software issues have been resolved. As of yet it is too early to assess results of this PIO.

*Conclusion: Complete if PIO has been completed*

*Fiscal Resources Status:*

- Funded by Instructional Equipment Budget FY 2014-15.

**PIO Resources:**

- Resource: Instructional Software  
Description: Power Lab  
Est. Cost: \$5,000.00
- Resource: Computer Related Equipment  
Description: Lap Tops for Power Lab Software  
Est. Cost: \$12,000.00

2. *Based on the program data analysis and PSLO analysis, identify your Program Improvement Objective(s): What are you going to do? Why are you going to do it?*  
Separate Biology Lab Technician and Biology and Chemistry Learning Center Coordinator positions into two full-time positions and hire staff to fill these positions.

*Notes (optional): Please include any notes related to your PIO. (2500 Character limit)*

*Program PIO will address the following:*

- Student Learning & Achievement
- Success Rates
- Service Impacts
- Increase Program Enrollments

*How will you assess the effectiveness of your PIO:*

Annual survey of faculty who teach in these labs and/or whose students use the Learning Center.

**PIO Action Plan:**

*How will you accomplish this?*

In coordination with the Dean and HR, write new job descriptions for 1 full-time Biology Lab Technician and 1 full-time Biology/Chemistry Learning Center Coordinator. Hire qualified individuals to fill these positions.

*What is your timeline?*

2015-2016 academic year desirable, 2016-2017 at latest.

*Who is going to do this?*

Dean, Full-time Biology Faculty, HR

*PIO Status:*

- Completed

*Closing the loop - Describe the results of your PIO implementation or completion:*

A full time biology lab technician position has been approved and implemented. The biology/chemistry tutor center coordinator position has only been approved as a half time position. This limits the hours that the students can use the tutor center. In addition we would propose expanding the use of the tutor center and the position to be a science tutor center coordinator position that would include all of the science departments (physics, engineering, biotechnology etc.). It is desirable for the biology/chemistry tutor center coordinator position to become a full-time position upon moving the center into the new core facility.

*Conclusion: Complete if PIO has been completed*

*Fiscal Resources Status:*

- The Biology Department received approval to change the current employee, Kevin McCue from a split role of Biology Lab Tech and BCLC Coordinator to a 1.0 Lab Tech. In addition, there was approval for a .5 BCLC Coordinator position. This half-time position has been filled.

**PIO Resources:**

- Resource: Staff/Administrative Position  
Position Title: Science Lab Technician - Biology  
FTE: 1.0
- Resource: Staff/Administrative Position  
Position Title: Instructional Assistant Biology-Chemistry Learning Center  
FTE: 1.0  
Est. Cost: \$54,000.00

3. *Based on the program data analysis and PSLO analysis, identify your Program Improvement Objective(s): What are you going to do? Why are you going to do it?*  
Expand offerings for Biology 101A and Biology 101B such that sections of both classes will be offered each semester. Revise the Biology 104 curriculum so that it

meets the recency requirement for Biology 103A and 103B, as needed for health profession schools.

*Notes (optional): Please include any notes related to your PIO. (2500 Character limit)*

*Program PIO will address the following:*

- Student Learning & Achievement
- Increase Program Enrollments
- Increase Degrees/Certifications

*How will you assess the effectiveness of your PIO:*

The effectiveness will be assessed by annual enrollment numbers. The effectiveness of the biology 104 update will be assessed by retention in the Ohlone Nursing program

**PIO Action Plan:**

*How will you accomplish this?*

In addition to the present schedule (2 sections of Biol 101A in Fall and 2 sections of Biol 101B in the Spring semesters), one new section of Biology 101A will be offered in the Spring semester and one new section of Biol 101B will be offered in the Fall. Faculty from Ohlone's Nursing program and Biology 103A and 103B will be consulted on defining the depth of material that would allow Biology 104 to be an eligible course for recency.

*What is your timeline?*

The new section of Biol 101A will begin in the Spring 2016 semester. Restructuring of Biology 104 will begin in Spring 2017.

*Who is going to do this?*

Current Biology faculty, and Nursing faculty.

*PIO Status:*

- Revised
- Completed

*Closing the loop - Describe the results of your PIO implementation or completion:*

A new section of Biol 101A was offered in the Spring 2016 semester and a new section of Biol 101B was offered in the Fall 2016 semester. The opening of a new section of Biol 101A in the Spring semester did not decrease the enrollment in sections offered in the Fall 2016 semester. Thus enrollment in Biol 101A across the board has increased accordingly. Enrollments will be monitored to ascertain the feasibility of opening yet more sections of Biol 101A and Biol 101B in the future. The PIO relating to Biology 104 is yet to be implemented.

*Conclusion: Complete if PIO has been completed*

PIO achieved - worked

*Fiscal Resources Status:*

**PIO Resources:**

- Resource: Other Budget Related Resources Needed  
Description: Instructional supplies  
Est. Cost: \$500.00

4. *Based on the program data analysis and PSLO analysis, identify your Program Improvement Objective(s): What are you going to do? Why are you going to do it?*  
Split Biol 130 into two separate courses, one targeting allied health science majors and one targeting non-major students. Presently, Biol 130 serves both groups. The rigor and focus of Biol 130 is insufficient to adequately prepare students for the intense workload of 103A/B, while it can still often be too much for general education students.

*Notes (optional): Please include any notes related to your PIO. (2500 Character limit)*

*Program PIO will address the following:*

- Student Learning & Achievement
- Course Retention
- Course Completion
- Success Rates

*How will you assess the effectiveness of your PIO:*

By student success and retention.

**PIO Action Plan:**

*How will you accomplish this?*

The curriculum for Biol 130 will be revised with a focus on those pursuing degrees in the health sciences and planning on taking anatomy and physiology and microbiology. The course itself will cover most of the same topics as before, but with increased rigor and a greater focus on the topics that student?s need to succeed in 103A/B and 106. The new general education course created will be ?Essential Biology.? A new course will be created that is intended for non-majors and will offer an overview of many topics in biology with a focus on topics of public interest. The rigor of this course will be slightly lower than the current and future 130, though it will cover many of the same topics.

*What is your timeline?*

We intend to submit the new course plans to the curriculum and general education committees in the Fall of 2017 for inclusion in the catalog and implementation in the Fall 2018 semester.

*Who is going to do this?*

Biology faculty in conjunction with the dean.

*PIO Status:*

- New

*Closing the loop - Describe the results of your PIO implementation or completion:*

N/A

*Conclusion: Complete if PIO has been completed*

*Fiscal Resources Status:*

**PIO Resources:**

- Resource: No Resources Identified

**Attached Files:**

- [Biol 101A-Fall 2012 Course Assessment.pdf](#)
- [PR Biology 13-14A doc.docx](#)
- [SLO Assessment for Microbiology 106.docx](#)
- [103B SLO assessment 2012 attachment.docx](#)
- [Biol 103 Retention and Success Issues.docx](#)
- [2014Fall-sloa-Biol104.doc](#)
- [Assessment Biol 104 SLO 11.docx](#)
- [assessment of 103A & B fall 2015.docx](#)
- [Proposal-Biol 130 revision.docx](#)
- [103A assess f12.docx](#)