# Program Review

**For Cycle 2012-13 (2^nd Year Group)**

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<tr>
<td>Data provided by Institutional Effectiveness and Academic Services</td>
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## 6. College Wide

Overall – How does this information fit with the College Wide Goals?

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**Program Review Questions**

*Name of Program being reviewed: Biology*

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### 1– 3. Enrollment, Achievement, and HR Data

Summarize and interpret the data for each of the first three above as they relate to your program.

**Response:**

**#1 Enrollment Patterns**

The Life Science department is committed to providing students with a broad understanding of the sciences in order to make them successful in achieving an associate’s degree, transfer to a four year institution, obtain an RN degree, or enter a profession within the health field. The department offers lower division courses to give students a broad perspective in the sciences and/or health science and also offers some advanced classes for those who wish to enter a health profession. These advanced courses are often in high demand with long wait lists, as they fulfill the pre-requisites for the Nursing Program at Long Beach City College. Lastly, the wait lists do not reflect those students from Cal State Long Beach whom often try to crash into a science course because of the new unit restrictions there, but who are not officially on any wait list at LBCC.

Enrollment has slightly decreased in Anatomy sections in 2011/2012 compared to 2009/2010 due to a decrease in sections. It is difficult for the Department to find part time faculty members that can teach Anatomy sections and still maintain a high academic standard for the class. There were three less sections of Anatomy offered in the 2011/2012 school year as compared to 2009/2010. In Anatomy, Hispanic students make up the highest percentage, 36%, of those who enrolled during 2011/2012. Also, female students made up 67% of the total students who enrolled for Anatomy during 2011/2012.

Overall, the majority of students in the Life Science Department are enrolled in a Biology course. In Biology, the number of sections increased by 10% from 2009/2010 to 2011/2012. Therefore, this has decreased the number of students on a waitlist for Biology by 29% from 2011/2012 as compared to 2009/2010. Despite this decrease, there were a total of 480 students on a waitlist for Biology during the 2011/2012 academic year. During the 2011/2012 academic year; there were no sections of Biology offered at the PCC campus, but sections of
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Biology 41 and 41L are scheduled for Spring 2013. These sections will be held in our new laboratory facility.

For HLED, there were 4 fewer sections offered during 2011/2012 as compared to 2009/2010. The number of students who have enrolled in an online class HLED has remained consistent over the 3-year period.

In Physiology, one section was added in during the 2010/2011 year as compared to 2009/2010. This extra section was also maintained during 2011/2012. Also, the number of Hispanic students who enrolled in Physiology increased from 23% in 2009/2010 to 32% in 2011/2012.

Despite the department adding additional sections in Biology and Physiology during the 2011/2012 year, there were a total of 1,417 students on a wait-list for the entire Life Science Department. This accounts for 9.3% of those students who were on a wait-list college wide for Long Beach City College (including the LAC & PCC campuses).

Lastly, the enrollment data reflect that the student population that we serve is very diverse and in particular the number of Hispanic/Latino students who enroll in a science course has significantly increased as we have become a hispanic-serving institution.

#2: Achievement Data:

Overall, the faculty in the Life Science Department has worked to meet the demands of a diverse student body while maintaining a high academic standard for the students.

The Anatomy course offered by the Department is often the first class taken by many pre-Nursing students, and is often a challenge for many students who begin their prerequisites. Therefore, the overall success rate for Anatomy is significantly less (average of 45% over the three year period) compared to the average college wide success rate of 64% from 2009 thru 2012. The Spring of 2012 had the lowest success rate, 38%, of any semester from 2009 to 2012. The Department is projecting that success rates in Anatomy may decrease even further with the closing of the Life Science Learning Center in Building D, due to lack of staffing.

In Biology, the overall success rates have increased by 6.5% in 2011-12 compared to 2009-10. The overall success rate in 2011-12 was 65.92%, which is consistent with the college wide success rate during the same year. Also, the success rates increased across all of the reported ethnicities in 2012 as compared to 2009. In particular, the success rates for Pacific Islanders increased by 11% in 2011/2012 compared to 2009/2010. Also, despite the fact that the number of Black/African American students has remained consistent; the success rate increased by 11% in 2011 compared to 2009. Out of those students who were retained in a Biology class; there was an 8% increase in the number of students who earned an “A” or “B” in 2011-12 compared to 2009-10.

Students have proven to have consistent success rates within the Health Education courses. Also, students seem to be equally successful in the online HLED courses as in the face-to-face courses.
In Physiology, out of the students who were retained in the class, there was an increase in the number of D and F grades assigned, from 17% to 24% over the three-year period. Students have become more informed about the impact of a "W" in a science course on the GPA calculated for ADN admission and now often elect to stay in the course and receive a letter grade.

As far as retention, there were slight increases in retention rates, 65% to 68% for Anatomy, 80% to 84% for Biology, and 87% to 88% for Health Education when comparing 2009/2010 to 2011/2012. Therefore, for the entire Life Science Department there was a slight, but not significant, increase in retention from 80.6% (2009/2010) to 83% (2011/2012).

#3. Staffing

FACULTY:

The Life Science Department has the multifaceted mission of 1) transfer preparation 2) preparing students to attain an associate degree, 3) helping students satisfy biological science prerequisite requirements for various programs at LBCC and other colleges. Accomplishing this mission has become increasingly difficult due to two main factors: 1) the loss of faculty and staff and 2) the mandate by the Board of Registered Nursing that prospective nursing students must take Anatomy, Physiology, and Microbiology courses each with a laboratory component.

Since 2003 the number of Full-Time Faculty has been reduced from 15 to 11. This situation is compounded by the transition in curriculum and resources to teach the increased student demand for Anatomy, Physiology, and Microbiology lecture/laboratory courses which are now required by the State of California. Teaching loads have necessarily been increased in these areas, thus limiting the number of faculty available to teach General Biology. The result is a 33 percent decrease in General Biology sections over the last 9 years. As a consequence, we are unable to offer the wide diversity of biology courses traditionally available at LBCC as well as most other Biology Departments.

Data reveals a continued demand for general biology courses (and other departmental courses) with over 200 students added to waitlists each semester over the past 3 years. Students have informed us that they have been turned away sometimes 3 to 4 semesters. This definitely impedes a fluid pathway to success. In review of “Success Rate Data” for biology courses we have been unable to raise the success rate above 65.82% over the last 3 years. We interpret this as a result of larger class sizes due to having only one dedicated General Biology Instructor.

Furthermore the Life Science department has been asked by the Administration to have Full-Time Faculty teach and hold office hours at the Pacific Coast campus. In response, the department has added a general biology lab and lecture class to be offered at PCC starting in Spring 2013. The hiring of at least one General Biology faculty would allow us to offer the number of courses and sections previously available at LAC as well as strengthen our ability to expand the number of courses offered at PCC.
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CLASSIFIED:

In the past year we have lost one Full-Time Classified person and one 16 hour Classified person (originally this 16 hour position was 40 hours split by 2 people) due to layoffs. These staff reductions have forced us to close the Life Science Study Center, which has served virtually all Health Education, Biology, Anatomy, and Physiology students. The Study Center usage peaked in 2009 when we had stable, full-time staffing and night hours coverage. There were 3434 student visits for 3811 hours of use. Upon looking at Biology 60 SLO #2 assessment it was noted that the closure of the “Life Science Learning Center” impacted the success rate as it is an integral part of the student experience and means of study.

We envision the need for two 16 hour Classified Staff replacements (for the 56 classified work hours lost in Spring 2012) in order to bring back student accessibility to the success related Life Science Study Center at LAC. One of the 16 hour classified employees would be needed to assist in operation of the Life Science Study Center at LAC. While not supplying optimal study center hours, this would allow students to have some access to crucial models, materials, and learning activities. The other 16 hour Classified employee could split their hours between the study center and PCC assisting in lab set-up, clean-up, and preparation for new class assignments.

4. SLOs

a) Summarize the collected program data

Over the past year or so, faculty in the Life Science/Health Education Department have been collecting course SLO assessment data and submitting it to our SLO Officer, Dave Gayle. The SLO officer collects data, enters data into TracDat, and is available to answer questions, and offer support to faculty regarding this process.

SLO assessment data was collected for the following courses: Bio 1A, Bio 1B, Bio 2, Bio 20, Bio 25, Bio 41, Bio 60, ANAT 1, ANAT 41, Physi 1, HLED 3, 4, 5 and 10. Faculty members have been meeting within their respective disciplines to discuss both the process and the outcomes of SLO assessment. Adjunct faculty have been encouraged to participate in the SLO assessment process, as well. Through discussions among faculty members, questions were raised in regard to the SLO’s themselves, expected outcomes, as well as assessment tools to measure these outcomes. As this process evolves, we will continue to hone our assessment tools and make any necessary adjustments. To this end, we recognize that more frequent faculty meetings within our sub-disciplines would be very beneficial.

4b) Based on analysis of course and program SLO assessment:

- How are program-level and course-level SLO’s being implemented, assessed, and used for program improvement?

SLO’s are being implemented as described in previous section (4a.) SLO assessment data was collected for the following courses: Bio 1A, Bio 1B, Bio 2, Bio 20, Bio 25, Bio 41, Bio 60, ANAT 1, ANAT 41, Physi 1, HLED 3, 4, 5 and 10. A summary of all course SLO data, organized by Program SLO, is found at end of question #4.
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Each faculty member is evaluating SLO results for his/her course and determining the appropriate course of action for improvement. A summary of some of the actions that faculty members are taking are as follows: When the expected SLO outcome was not met, faculty members will try different approaches to enhance student learning. Lectures will be modified, more class time will be dedicated to particular topics to allow students to discuss and review difficult concepts. Faculty members will continue to assess students during subsequent semesters, and will attempt to get student samples that are representative of all classes (i.e., day and night classes, classes taught by FT and adjunct faculty.)

- Summarize how the program has responded to SLO assessment results.

As part of the on-going process, our Department is in the early stages of analyzing the data and making relevant changes to all courses offered in response to collected data. Proposed changes include: different teaching methods, different assessment methods, different approaches (i.e., models, hands-on learning) for teaching material, use of web-based learning tools, more class time for discussion and review of difficult concepts, and other best practices.

ACTION TAKEN: Several faculty members have included adjunct faculty in the SLO assessment process. Dialog among faculty members provides rich opportunities to share outcome data and resources, brainstorm teaching techniques for difficult topics, and share ideas for future assignments that align with course SLO’s.

- Discuss how each action/change is based on ASLO results and how it will contribute to the improvement of the program.

Faculty members will continue to assess SLO’s during future semesters; this will provide continual data to measure success in meeting expected outcomes.

In addition, on-going dialog between faculty members, including adjunct faculty, will be a valuable component of the course and program improvement process.

Following is a summary of course SLO data, organized according to Program SLOs:

Program SLO #1 - Assimilate information from various sources and apply critical thinking to form evidence-based conclusions (scientific method) to issues in the realm of biology, health, and as a consumer in society.

Bio 41 – using embedded test questions, more than 60% of all students correctly applied the scientific method in response to all 5 questions.

Bio 1A – using selected labs for evaluating scientific method, 72% of students (n=64) performed at 70% or above.

Bio 2 – Having students use all related lab skills and techniques to identify assigned “unknown organism,” data found that 93.5% (n=116) achieved 70% or above on this project.

HLED 3 – using embedded test questions to measure critical thinking skills and ability to form evidence-based conclusions regarding health issues, 40% of students achieved a score of 70% or above.
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**HLED 5** – using embedded test questions to test understanding of concepts, the criteria of 70% of the class (n = approx 35) achieving a passing grade on the embedded questions, was met

**HLED 10** – Using a pre/post test, a majority (96%) of students (n=56) demonstrated improvement.

**Program SLO #2 - Demonstrate an understanding of all levels of organismal biology such as morphological, physiological, and developmental.**

**ANAT1** – All 4 course SLO’s align with Program SLO #2. Using embedded test questions to measure all 4 course SLO’s, 70% of students (n= 40) achieved 70% on 3 of the 3 SLO’s. On the 4th course SLO, 57% of students achieved 70% or better.

**ANAT 41** – using embedded test questions, expected outcomes (70% of students will get 3.5/5) were met on 3 test questions. 74% of the students assessed achieved this SLO. (n=38)

**Bio 60** – using embedded test questions, 60% of students (n=38) achieved 70% or higher on questions that captured the course SLO (nervous/endocrine system)

**Bio 41** – using embedded test questions, 60% of all students correctly compared/contrasted the life-supporting chemical processes of cells.

**Bio 1A** – using embedded test questions, 71% of students (n= 64) performed at 70% or above.

**HLED 3** – using embedded test questions to test understanding of human anatomy/physiology, 40% of students achieved a score of 70% or above.

**HLED 4** – using embedded test questions to test understanding of physiology as it relates to principles of a healthy lifestyle, a more than 70% of students (n= 110) achieved expected outcome of 70% or better. For one question, 49% of students correctly answered.

**HLED 10** – Using a pre/post test, a majority (96%) of students (n=56) demonstrated improvement.

**Program SLO #3 - Demonstrate knowledge of the importance of the diversity of organisms on earth and their ecological and evolutionary relationships, including human impact on other organisms (or the reciprocal) and ecosystems.**

**Bio 41** – using embedded test questions, 70% of students (n=38) correctly answered embedded questions on final exam.

**Bio 1A** – using embedded test questions, 61% of students (n=58) performed at 70% or better

**Bio 2** – Having students use all related lab skills and techniques to identify assigned “unknown organism,” data found that 93.5% (n=116) achieved 70% or above on this project.

**Bio 20** – using embedded test questions, 50% of students (n=29) achieved expected minimum of 66% correct

**HLED 3** – using embedded test questions to test understanding of concepts, 40% of students achieved a score of 70% or above.
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HLED 4 – using embedded test questions to test understanding of concepts, a more than 70% of students (n=110) achieved expected outcome of 70% or better. For one question, 49% of students correctly answered.

HLED 5 – using embedded test questions to test understanding of concepts, the criteria of 70% of the class (n = approx 35) achieving a passing grade on the embedded questions, was met

HLED 10 – Using a pre/post test, a majority (96%) of students (n=56) demonstrated improvement.

5. Goals 

a) Based on the data from questions 1-4 and any other relevant internal or external data your department has collected, how have your department and program goals developed and changed over the past three years?

The Life Sciences Department has established goals over the past three years to fulfill our multi-fold mission of 1) transfer preparation, 2) preparing students to attain an associate degree and 3) helping students satisfy biological science prerequisites for various programs at LBCC and other colleges. Our goals have been designed to promote student success in support of LBCC’s Educational Master Plan, the President’s Agenda and the Board of Trustees college goals. We have had ongoing discussions on how best to offer a high quality science education in the midst of the financial crisis, faculty retirements and staffing shortages, lack of college preparedness among students, the 16-week schedule transition, and insufficient lab equipment. The long waitlists for biology classes and steady success rate of 65.82% reflect the challenges of having larger class sizes and only one dedicated General Biology instructor. Teaching loads have increased while at the same time, full-time faculty has decreased by four people. This has been compounded by the overflow of students coming from the CSU and UC systems due to frozen admissions, reduced course offerings, and tuition increases. The Life Science department has worked very hard to develop and implement cohesive strategies to provide high quality instruction while facing these challenges. We have modified our goals to revise and update course curriculum, incorporate new technology, and integrate various teaching methods. We have also prioritized the creation, implementation and assessment of program and course-level SLOs for all Life Science and Health Education courses.

b) Discuss the steps you have taken to address each goal. What have been the results of these efforts?

Goals In Progress 

Goal #1: Update and revise the Life Science Department Web Site

Two faculty members have volunteered to design a web site that will make faculty and course information accessible for students. This goal appeared in last year’s program plan. Unfortunately, the faculty members have been unable to take required CMS training that is offered at the same time on two consecutive days. They could each complete one day of the course but they have been told that is unacceptable. The faculty members will continue to request that some accommodation be made so that the web site can be designed and be implemented. Progress on this goal has unfortunately stopped.
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Goal #2: Native Plant Landscaping

This goal appeared in last year's program plan. The project has been cleared through the Grounds Supervisor and the Vice President of Administrative Services. Currently, the Horticulture department is planning construction of the irrigation system and the Life Science Faculty members have prepared a list of prospective plantings. This project will be used for Horticulture student instruction, and once completed will provide students in the Life Science department with a "living laboratory". No ground has yet been broken.

Goal #3: Replacement of Unstable and Dangerous Laboratory Classroom Chairs

We have requested new chairs for several years and will continue to do so. The current wood and metal chairs are inherently unstable and students often fall off these chairs. We fear that someone will be seriously injured. A total of 156 desk height and 91 taller laboratory bench height replacement chairs are needed. These chairs are located in D201, D211, D214, D215, D217, D212, D208 and D227.

Goal #4: Revise Biology 41 Laboratory Curriculum

Much progress has been made on this goal. Over the past two years five new labs have been developed. These labs were tested in the classroom, modified, and final versions are now being utilized in the classroom. Replacement of two of the remaining labs will be completed within the coming year. Minor revisions of other labs will continue over the next several years.

Goal #5: Regaining Life Science Learning Center Support

The Life Science Learning Center was much smaller in the 1990’s when it was open for 60 hours per week. During the 2010-2011 school year it was only open for 37 hours or less. During that year it served 1188 students who made 5842 visits for a total of 6950 hours of use. In previous years we recognized the importance of this center to our students and requested additional classified staff. Unfortunately, the Center is now closed, a consequence of the budgetary problems experienced by the college. The Center offered unique services not available elsewhere on campus. We are already beginning to see the impact of this closure on student success in a variety of our courses.

Goal #6: Usage of Musculoskeletal Models to Teach Anatomy

New goal that will be initiated this school year

Goal #7: Increase General Biology Course Availability

Our department has requested a new general biology instructor for several years. Our need has been recognized by the Hiring Priorities Committee but our request has been ranked just below the cut off for funding. We will continue to request the filling of this position.

Goal #8: Web-enhancement of Health Education Courses

Two full-time faculty members participated in two days of training on LBCC’s web enhancement programs at the Faculty Resource Center. However, with the adoption of e-ZLRN, the work that was previously done became obsolete which was quite a setback. Six sections of HLED 10 participated in beta-testing a new on-line student-learning program to supplement classroom instruction. Similar web-based resources are being considered for HLED 3. We also plan to receive training in e-ZLRN with the intent to make all health education courses web-enhanced.
Goal #9: Pathways to Student Success

This is a new goal that will be initiated this school year.

Goal #10: Revise Biology 60 Laboratory Curriculum

This is a new goal that was initiated this past summer. With the initiation of the 16-week semester it became clear that combining of labs was essential. Three faculty members met this summer and decided to completely revise and combine two labs. Hands-on lab activities were designed which include two case studies. The labs are due to be piloted this Spring. A Foundation Grant has been submitted to cover the costs of materials and provide funding to partially cover the hours worked by an adjunct faculty member.

Completed Goals

Several goals have been completed over the past three years.

1. Cross Train Probationary Life Science Faculty

Probationary faculty members were cross trained to teach a variety of courses within anatomy and physiology. The aim was to broaden the availability of full time faculty that could teach high demand courses such as Anat 1, Anat 41, Physi 1, Bio 60, and Bio 41.

2. Initiate Activities Required for the Opening of the PCC MDAB Lab Classroom

Planning and purchasing of equipment has been completed. The lab does still need to be set up for a set up so that the facility is ready for the Spring semester.

3. Upgrading of Our Projection System Equipment to Display Microscopic Images

Two new demonstration microscopes (one dissecting and one compound) were purchased with Pepsi Grant funds.

4. Orientation for New Adjunct Faculty

An orientation document was produced to enable adjunct faculty to function optimally in a new assignment within the department.

c) Based on the new data collected, what are your plans for change in the future?

We will continue to focus on our mission dedicated to supporting the President’s and Board of Trustees goals for Student Success and in direct alignment with the Educational Master Plan. Among our plans include the following: 1.) offer new sections for Biology and Health Education at the PCC campus, 2.) request for the reinstatement of the Life Science Learning Center, 3.) reassess, modify and assess course-level SLOs, 4.) continue to incorporate technological enhancements (e.g. web resources), and 5.) develop a recommended pathway for life science courses to help guide students through science requirements. In addition, we will work to strengthen our community-based relationships and increase the visibility of the Life Sciences
6. College Wide

Discuss how the program SLOs as well as the department goals integrate, articulate, and complement the institutional goals and initiatives. (How does your department fit into the big picture?)

Response:

The Long Beach City College Mission Statement reflects the driving force for instruction in the Life Science Department as we value equitable student learning and achievement while upholding academic excellence. This has been a growing challenge due to the erosion of sufficient science-based preparation of the entering LBCC student population.

All of our departmental goals have been aligned with the Educational Master Plan Institutional goals as presented in the following table. Each of these goals have been discussed in detail in the Program Plan.

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<th>Life Science Department Goal</th>
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<td>#1: LBCC will improve the rates at which students gain the foundational skills necessary to complete college level work and to achieve their educational and career goals.</td>
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<td>#4: LBCC will develop and focus its human, fiscal, facilities, technical and</td>
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<td>information resources in support of institutional goals.</td>
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