

LMC Comprehensive Program Review

Instructional Units

2017-2018

Program/Discipline: Biological Sciences

The following provides an outline of the required elements for a comprehensive unit/program review for Instructional Programs and Units. Upon completion of this report, please upload your document in the unit/program review application data/documents tab.

1. Program Changes

1.1. How have your degree and certificate offerings changed over the last 5 years? (e.g. new programs, discontinued or major changes to existing programs)

The only change the Biological Sciences instructional program has made to our degree offerings is converting our Biology AS to an AS-T in 2015.

1.2. What changes are you planning to your degree and certificate offering over the next 5 years? What is the rationale for the anticipated changes? Will these changes require any additional resources?

We do not plan to make any changes to our Biological Sciences or Nutrition degree/certificate offerings in the next 5 years.

2. Degree and Certificate Requirements

Please [review the data](#) provided on all degree/certificate completions in your program, including locally approved College Skills Certificates from Fall 2012—Spring 2017.

2.1. For each degree/certificate offered, map a pathway to completion of courses within the major in a maximum of 4 semesters, assuming a maximum of 6-10 units of major courses within a semester. Use the following format:

Name of Degree or Certificate: AST in Biology

Semester	Semester 1	Semester 2	Semester 3	Semester 4
List Courses Needed for Degree or Certificate in each semester.	Biosc 020 Chem 025	Biosc 021 Chem 026	Phys 35 / 37 Math 50 Chem 028 OR Phys 040	Phys 36/38 Math 60 Chem 029 Or Phys 041

3. Frequency of Course Offerings

Please [review the data](#) provided on frequency of all courses offered in your discipline in the last 2 years (Fall 2015-Spring 2017).

3.1.If a course has not been offered in the past two years, but is required for a degree or certificate, please explain why it has not been offered, and what the plan is to offer it in the future.

The Biology Department has offered all courses in the curriculum every fall and spring semester for the past two years.

3.2.If the course is not required for a degree or certificate, is the course still needed in the curriculum or is the department considering deleting it?

All courses that are offered by the Biology Department satisfy prerequisite, major, GE, and/or transfer requirements. We are not considering deleting any of our courses.

3.3.For the next two years, project how frequently your program intends to offer each course. Please provide a rationale for any major changes from the last 2 years that you anticipate.

Course	Estimated Number of Sections Offered by Semester			
	Fall 2018	Spring 2019	Fall 2019	Spring 2020
<i>Biosc 5</i>	5	5	5	5
<i>Biosc 7</i>	2	2	2	2
<i>Biosc 8</i>	4	4	4	4
<i>Biosc 10</i>	6	6	6	6
<i>Biosc 20</i>	4	2	4	2
<i>Biosc 21</i>	2	3	2	3
<i>Biosc 30</i>	3	3	3	3
<i>Biosc 40</i>	5	5	5	5
<i>Biosc 45</i>	4	4	4	4
<i>Biosc 50</i>	2	3	2	3
<i>Nutr 55</i>	4	4	4	4
Rationale for any Major Changes				

Although we do not plan on major changes in the number of section offerings for any of our courses, the upcoming transition to compressed calendar may impact our lab facilities, and force us to cut section offerings across the board.

Also, since the opening of the new Brentwood campus is not scheduled to occur until after Spring 2020, the increased Biology Department offerings for this are not included in the table above.

4. Existing Curriculum Analysis

4.1. Course Outline Updates

Please [review the data](#) provided on the status of COORs in your discipline. (Note: This data does not reflect courses submitted after May 2017.) For each COOR that has *not* been updated since Spring 2012, please indicate the faculty member responsible for submitting the updated COOR to the Curriculum Committee by April 18, 2018.

Course	Faculty Responsible for COOR Update
BioSc 5	Currently Up To Date
BioSc 7	“
BioSc 8	“
BioSc 10	“
BioSc 20	“
BioSc 21	“

BioSc 30	“
BioSc 40	“
BioSc 45	“
BioSc 50	“
NUTR 55	“

4.2.Course Offerings/Content

<p>How have your courses changed over the past 5 years (new courses, significant changes to existing courses)?</p>	<ol style="list-style-type: none"> 1. We have moved out of the drop-in “lab hours by arrangement” model for BioSc 5, 10 and 30 and instituted formal wet labs. 2. We have added an additional course, BioSc 8, Human Biology to our curriculum. 3. We now offer BioSc 5 in an online format as well as traditional face to face. 4. We incorporated a research experience in BioSc 21.
<p>How have these changes enhanced your program?</p>	<p>Students now have a much improved learning experience that more closely aligns with standard science lab curriculum. They are benefitting from the increased presence, guidance and expertise of faculty trained and dedicated to each particular course for their scheduled lab hours as opposed to the previous system which depended on whatever faculty happened to be on</p>

	<p>duty. Holding the lab hours in dedicated science lab facilities has widened access to better, more modern materials and equipment. This allows for increased variety of lab exercises, many of which utilize modern technology, which further enriches their experience.</p> <p>The addition of BioSc 8 to our curriculum offers another choice for students to satisfy the lab science requirement for transfer and graduation.</p> <p>The increased flexibility of the online format for BioSc 5 has improved access to this course for busy students who cannot fit a face to face course into their schedule.</p> <p>The added BioSc 21 research experience has provided students with opportunities to develop their scientific thinking and process research skills.</p>
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5. New Curriculum Analysis

5.1.If you are creating new degrees or certificates in the next 5 years: (Indicate N/A if no new degrees or certificates are planned.)

What additional courses will need to be created to support the new degree or certificate?	N/A
What significant changes to existing course content would need to be made to support the new degree or certificate?	N/A

6. Advisory Board Update (For all CTE TOP coded programs)

Give an overview of the current purpose, structure, and effectiveness of your Advisory Board. Include: membership, dates of last meetings over the past two years.

N/A

7. Assessment Effectiveness:

7.1.Course Level Assessment

Please [review the data](#) provided on assessment status of courses in your discipline in Cycle 1 (2012-2017).

7.1.1. If there were any courses that were not assessed in Cycle 1, please explain why they were not assessed.

N/A

7.1.2. If a course was not assessed in Cycle 1 because it was not offered, what is the future of that course?

N/A

7.1.3. Course level assessment should be meaningful, measurable and manageable. Overall, reflecting on the course level assessment, please rate the degree to which you feel your assessments meet these 3M's.

Meaningful:

1	2	3
The assessment was not meaningful in collecting data or information that supported course improvement or pedagogical changes.	The intent was understood, but the outcome fell short of meeting the objective of course assessment, which is to improve student learning. The changes to the course or pedagogy to support the course were not clear.	Changes were made to the course content or delivery to improve course effectiveness. The process promoted pedagogical dialog within the department, and changes were adopted accordingly.

Measurable:

1	2	3
The data collected did not inform teaching and learning.	The assessment produced some measurable information, but created more questions than answers.	Results were straightforward and easy to interpret. The course of action to improve the course or its delivery was clear from the data that was collected.

Manageable:

1	2	3
Assessment was not manageable.	The assessment process was somewhat manageable, but posed challenges to implement across the program.	The assessment was easily scaled across the department so that full- and part-time faculty could participate with meaningful outcomes.

Reviewing CSLO reports from the past 5 years revealed the following trends:

- Mostly exam questions were used as assessment tools, though there were some lab reports, projects, and presentations utilized to examine achievement of learning outcomes
- Proficiencies were across the board for our department's CSLOs.
- Level of reflection was limited across our reports, though curricular and pedagogical changes were suggested for some courses.

Meaningful = 1-2, Measurable = 3, Manageable =3

Below are the summaries for each CSLO report:

- Bio5 - Mix of assessment tools used. Proficiency data were hard to understand. Substantial reflective discussion and curricular changes reflected in report.
- Bio7 - assessment tools were MC exam questions, one lab report, and one oral presentation. High proficiency on all. No curricular changes.
- Bio8 - assessment tools varied. Proficiencies varied. Reflective next steps regarding curriculum and pedagogy included.
- Bio10 - assessment tools varied. Proficiencies across the board, many high. Data presented from 3 separate sections, along with 3 separate reflections from each faculty assessing. Curricular changes implemented varied across 3 separate instructors
- Bio20 - There was normal range of proficiencies across the CSLOs using a variety of assessment tools. A few curricular changes were suggested and student abilities' were reflected

on. Otherwise, course curriculum and CSLOs were established to be effective for these biology transfer students.

- Bio21 - variety of assessment tools used. Proficiencies largely high. Some curricular/pedagogical changes included in improvement plan.
- Bio30 - mostly exam questions used for assessment purposes. Proficiencies were difficult to understand, as percentage sums exceeded 100%. One substantial curricular change included.
- Bio40-limited information on assessment tools. Seems as though they were built into the course (midterm and lab questions), which is very manageable. Proficiencies were all between 64 and 80%. Excellent level of reflection and substantial, yet manageable curricular changes made.
- Bio45 - Effectively utilized exam questions as assessment tools. Proficiencies reflected a normal distribution appropriate for a rigorous pre-professional prerequisite course. Recommendations were to continue with current curriculum for most CSLOs.
- Bio50 - Effectively utilized exam questions as assessment tools. Proficiencies mostly high. Next steps included consideration of implementing additional pre-reqs.
- Nutr55 - variety of assessment tools used. High proficiency on all. Level of reflection minimal... curricular changes not entirely clear, other than going over instructions more carefully.

7.1.4. What changes in the assessment process itself would result in more meaningful data to improve student learning?

Potentially using some different assessment tools and metrics might reveal a deeper look into students' performance, as well as the experiences that led them to that performance. The data collected indicated student performance, but how students achieved proficiency could be considered in assessment tools - student self-reflection, randomly interviewing a few students, or surveying students on their learning could help with identifying possible pedagogical changes.

7.1.5. Share an outcome where assessment had a positive impact on student learning and program effectiveness.

In Bio40 (Anatomy), as a result of assessing a CSLO on visual and tactile identification of organs, instructors attempted a new in-lab assignment in which students draw and label all assigned tissues. While the dataset produced was too unwieldy to grade in a time-effective manner, instructors compromised by deciding to choose a random selection of drawings to analyze for accuracy. Going forward, it seems like this type of assignment would be telling for formative assessment, giving the instructor a temperature of student understanding on a set of anatomical parts. Gaining insight on how a representative sample of students is learning course content could definitely inform pedagogy going forward in the semester and overall lead to greater achievement of SLOs in the course.

7.2. Program Level Assessment

7.2.1. In 2016-2017, units engaged in program level assessment. Please submit all Program Level Assessment Reports using the link provided. Describe one important thing you learned from your program level assessment.

The Biological Sciences program found that providing students with multiple opportunities to practice concepts and skills (scaffolding lab reports and research projects and

revisiting/assessing conceptual themes throughout the semester) supported student success in demonstrating PSLOs. We plan to repeat and expand these opportunities going forward.

7.2.2. What was the biggest challenge in conducting program level assessment?

We struggled with finding an appropriate time to administer the post-assessment to our students. It was apparent that student motivation and alertness were not prime in their written responses. The “end” of our program is the conclusion of a two-semester sequence of rigorous courses in which students are extremely fatigued; thus, student assessment receptivity and focus will likely remain ongoing challenges in PSLO assessment. As a department, we also struggled with the wording of our PSLOs, and as a result, have revised the wording of 3 out of 4 of our PSLOs to clarify meaning and avoid possible misinterpretations by both instructors and students.

7.2.3. What resource needs, if any, were identified in your program level assessment?

Training on writing test questions and SLOs is needed to ensure our PSLOs are measurable and reflective of program conceptual themes. Additionally, opportunities for dialogue among instructors are required to foster group meaning making and share best practices.

8. Course Success/Retention Analysis

Please [review the data](#) provided on course retention and success, which has been disaggregated by as many elements as district can provide in their SQL Report

One of our college goals as stated in our Integrated Plan is to “Increase successful course completion, and term to term persistence.” Our Equity Plan identifies African-American and low income students as disproportionately impacted in terms of successful course completion. (Foster youth are also disproportionately impacted on this indicator, but numbers are too small to disaggregate by discipline/program) Please indicate how well students in these groups are succeeding in your discipline.

	African-American	Low Income Students	All students in program/discipline
Completion Rate (program/discipline)	78.6%	82.8%	84.9%
Success Rate (program/discipline)	64.6%	72.6%	74.9%

8.1. In looking at disaggregated data on success/retention, is there anything else that stands out?

BIOLOGY DEPARTMENT EQUITY EVALUATION

So, what do the success and retention numbers we were provided indicate about equitable outcomes in the biology department? Probably not very much. One serious issue with this sort of data analysis is that we were not given success and retention numbers broken down by course title, section number, or course type, so it is not possible to conclude from the global data set if apparent equity issues are evenly distributed throughout all biology courses and instructors, or if these issues are concentrated in just certain courses or sections. Our department would need to be provided with a far more complete success and retention data set to answer this critical question.

Given the limited data set we have we can make a few generalizations: For the most part student success and retention in regular biology courses does not seem to be terribly unevenly distributed among self-identified student groups. The major exceptions are students who self-identify as African American, students who refuse to state their ethnicity (these students have the poorest success and retention outcomes), and students who self-identify as Caucasian. Those are the obvious and consistent statistical “outlier” groups over the past five semesters. Overall students who identify as African American have lower than average retention and successful completion percentages in both regular Biology and Nutrition courses. In regular biology courses self-identified Caucasian students consistently have the highest retention and success rates. Asian, Hispanic and Filipino students have consistent success and retention rates that mirror the departmental averages over the past five semesters. Also over the past five semesters there has not been a lot of variance in overall success or retention rates for the biology department as a whole, nor for specific self-identified ethnic student groups, excluding our nutrition courses (this is discussed below).

An interesting statistical anomaly is that success and retention data for our nutrition course indicates a surprisingly large semester to semester variance. This large variance exists both for the overall course data and for the data provided for self-identified ethnic groups. We do not have an explanation for this statistical anomaly, except that the total student numbers of students enrolled in all sections of our nutrition course is significantly smaller than the total number of all students enrolled in all other biology courses. Smaller numbers can increase statistical variance, but the semester to semester changes in our nutrition course data are still higher than one would expect, even given the smaller sample size. Another interesting statistical oddity is that self-identified Caucasian students perform significantly less well in nutrition courses than they do in regular biology courses, while low income students tend to perform as well or better than higher income students in our nutrition courses. Again, we can determine no obvious explanation for these results.

Analysis of the success and retention data for Low Income and African American groups: Low income students have slightly lower than average retention and success compared to the overall department average. An important question to answer when analyzing success and retention data is to try to disentangle the students who drop a course due to external factors (“life issues”) vs students who drop or fail a course due to problems with the course content or instruction (“academic issues”). The reason it is important to distinguish between these two types of student failure is that effective instructor interventions that might significantly improve student retention or success are quite different depending on the ultimate cause. For example, a student who drops out of a course due to financial or health issues requires different sorts of interventions than a student who drops or fails due to frustration with their inability to master course content.

Using success and retention statistics alone it is difficult to determine with accuracy WHY students might not succeed in a course or program or department, yet this determination is critical to improving student success. However there may be one statistical metric we can use to help us distinguish these two different impediments to student success: If we divide the percentage of students who succeeded in the department by the percentage of students retained in the department we get a metric that I will call successful retention. Successful retention is the percentage of students who completed a course who actually passed the course. In the Biology department the average successful retention is about 88%. That means on average nearly 90% of all students who finished a biology course passed the biology course.

The reason successful retention is an important metric is that it can indicate difficulties enrolled students had with the course content rather than with other life issues. In our experience students with major life issues that come up during a semester tend to drop a course, or be dropped by the instructor for non-attendance. In other words, they don't officially complete the course and so are not retained. These students are indicated in the retention statistics. Lower than average retention often indicates a student or group of students with major life issues that are interfering with their academic work. But, conversely, a lower than average successful retention percentage often indicates a student or group of students who had difficulty mastering the subject matter or completing assignments. For these students life issues

weren't serious enough to stop them from finishing the class, so their lack of successful retention most likely indicates their struggle with the academic assignments. Obviously there can be overlap between these two issues (for example life issues can prevent students from completing some class assignments or maintaining regular attendance), but we still believe successful retention is a useful metric for parsing the CAUSES of low success for a group of students.

Using retention, success, and successful retention metrics we evaluated four different self-identified groups of students in our regular biology courses during the Spring 2017 semester: Low Income students, Higher Income Students, African American students and Caucasian students, and compared their percentages to the overall departmental percentages. The numbers are reproduced below:

<u>Self-Identified Student Group</u>	<u>Retention</u>	<u>Success</u>	<u>Successful Retention</u>
African American	78.6%	64.6%	82.2%
Caucasian	89.3%	82.5%	92.4%
Low Income	82.8%	72.6%	87.7%
Not Low Income	88.9%	79.3%	89.2%
Department Average	84.9%	74.9%	88.2%

Based on the assumptions provided above, these numbers suggest a few conclusions:

First, the modestly lower course success of low income students is probably due in large part to life issues related to income and not to particular problems with comprehension of the course material. Notice that although these students have lower success and retention numbers than the departmental average (by a little more than 2%), their successful retention percentage is very close to the departmental average (87.7% vs 88.2%). This indicates that when low income students are able to remain in a biology course until the end they are nearly as successful as most other self-identified groups of students. Thus the lower than average success rates of low income students are due almost entirely to lower than average retention (indicating life issue difficulties), rather than problems understanding the course material or completing assignments.

Comparing the analysis of low income students with self-identified African American students is instructive. Notice that self-identified African American students have significantly lower retention than other student groups, indicating significantly a higher amount of external issues that can derail their academic progress. But they also have a significantly lower than average successful retention percentage, indicating some higher than average difficulties with comprehension or assignment completion in biology courses. Of course, it is also possible that the reason for the lower than average successful retention of self-identified African American students is lower assignment scores given them unfairly by racially biased or racist instructors. There have been studies indicating that some instructors do bias their grading of student work to favor certain ethnicities over others. It would take a fairly sophisticated analysis of student work previously graded by our teachers to determine if that is happening to a significant extent in our department.

Having said all this, we would like to make the following critical point that is often overlooked in campus discussions of equity issues: The whole concept of human “races” is scientifically bogus and has no biological validity. Biologically there is only one human species: Homo Sapien, and there is only one human subspecies: Homo Sapien Sapien. Biology recognizes no scientifically valid categorization of large human groups other than gender. Therefore, many of us find the whole concept of asking students to self-identify with an ethnic group, as if there were some sort of scientific validity to that identification, to be an offense against science and humanity. Requesting or requiring students to engage in this type of self-identification actually validates and perpetuates the racist ideologies that gave rise to these mythical human categories in the first place. We aggravate this problem further when we pre-identify a group of students as potential failures, or in need of special help, based on superficial physical characteristics. When we do this we risk inadvertently turning our statistical “knowledge” into self-fulfilling prophecy. For example, when we publicly identify a group of people such as African Americans as academically at risk we are actually publicly disrespecting that entire group of students, and that disrespect can negatively affect how we treat certain students in our classes and ultimately how these students view themselves. Let’s keep in mind that many self-identified African American students are not struggling in our classes, many are high academic achievers, and on average nearly two thirds who enroll in a biology class succeed in that class.

8.2. What are some strategies that might help students, particularly African-American, foster youth, and low income students successfully complete courses in your discipline? What resources would be needed to implement these strategies?

Biology Department Recommendations: Recognizing that many of our students struggle with life issues that adversely affect their course retention and success, and that many students also struggle with content in classes such as science and mathematics that deal with complex abstract concepts, and further recognizing that none of these struggles is unique to one particular skin tone or ethnicity, and further recognizing that skin tone does not correlate to intellectual abilities or potential, despite what both racists and well-intentioned but condescending liberals would have people believe, we the faculty of the LMC biology department recommend the following:

That LMC establish more on-campus support for students struggling with life issues that adversely affect their academic attendance or performance. This support can take many forms, including: An on-campus health center that includes a nurse practitioner and a mental health counselor to provide immediate help for students dealing with serious physical or mental health issues. Better and more frequent local public transportation and ride-sharing services to and from both of our campuses. An on-campus social service worker to help students dealing with serious life issues such as homelessness and poverty. More student financial aid, possibly in the form of additional student scholarships. More academic counselors and earlier recognition of, and intervention with, struggling students using a coordinated communication

and alert system shared by instructors and counselors (the Starfish system may eventually play this role).

As far as help for students struggling with academic issues in our biology classes our recommendations are the same for all groups of students: Instructors need to identify academically struggling students early in the semester (ideally not later than the sixth week of class), and talk to these students face to face or by email to try to identify their academic issues and suggest new academic strategies for each struggling student. These strategies can include anything from LD testing to tutoring or group study work. The instructor should follow up with these students to see if the suggestions were followed and if the interventions were successful. It would also be helpful if our faculty were given regular opportunities to talk with expert science-trained teaching/learning faculty to discuss effective learning/study strategies for our struggling students. Finally, we recognize that sometimes just getting to know our struggling students a little bit and offering some timely words of recognition and encouragement can make a surprisingly large and positive difference in their academic success. As conscientious teachers, we are all committed to helping our students succeed in our courses, but ultimately it does take a college-wide as well as a societal commitment to educate all students who truly want and education. No teacher or department is an island in the noble endeavor of higher education.

9. Goals

9.1. Review your program's goals as listed in response to the final question of your 2012-2013 Comprehensive Program Review posted in the Data Repository of the PRST.

Highlight some of the key goals that were achieved over the past 5 years. What were the key elements that led to success?

The first long-term goal in the 2012-2013 Comprehensive Program Review was to preserve and increase student learning, success, and engagement in biology courses. One of the main initiatives we completed was the conversion of the hours by arrangement in the Bio 5, Bio 10, and Bio 30 classes into a scheduled, real biology wet lab setting. This successful change in laboratory scheduling has allowed for better compliance with current state rules and campus mandates, pedagogical improvement, and increased student retention and success. The key factors of success in converting these courses include the support and approval of management and funding.

Over the past 5 years, we have also been able to maintain lab equipment in a fully functional state. The reliability of the equipment producing meaningful results is essential for conducting lab exercises and experiments. We were able to accomplish this through (1) maintaining classified tech prep staffing, (2) ensuring consistency with use and care guidelines with

which all enrolled students in laboratory classes should comply, and (3) managing our budget to ensure adequate funding is available for repair, maintenance, and, if needed, replacement of equipment.

Another initiative achieved under our first goal included the maintenance of the LMC nature preserve. As a result, the preserve continues to serve as a living lab for students in our Bio 7 and 21 courses and adds an attractive feature to our campus. We have been successful in the keeping of the nature preserve through guaranteeing a classified caretaker position is funded and ensuring funding is available for grounds equipment and supplies.

We have also made progress in resolving facility issues that support teaching and learning. For use starting Summer 2017, management had installed new smart room stations with upgraded technology, new projectors for better lighting, and new whiteboards. These changes helped resolve concerns with the previous smart stations design, address lighting/projection quality, and improve communication in the classroom (e.g. Epson Easy Interactive Tools software).

Our second long-term goal in the 2012-2013 Comprehensive Program Review was to preserve and expand opportunities for students to learn biology. Overall the general theme was that we were successful in achieving this goal. The following outline highlights the key goals we achieved and key elements that led to success.

One of the most important steps in expanding opportunities for students to learn biology, especially for our biology majors students, was the creation and maintenance of a full-featured biology wet lab facility at the Brentwood center. By creating these facilities we were able to expand our Biology majors classes (Biology 20 and 21) to the Brentwood campus. One of the key factors to establishing the wet lab was having sufficient funding, which we received from the HSI STEM grant. In order to maintain the lab one of the key factors was the creation and maintenance of a full-time biology faculty position and permanent classified lab tech position for the Brentwood center.

Another way in which we expanded opportunities for

	<p>students to learn biology was by increasing the number of sections and the variety of courses available for non-biology majors. We also converted several of courses with labs to scheduled lab hours instead of HBA lab hours. Below are ways in which course offerings have changed:</p> <ul style="list-style-type: none"> ○ Four sections of a new non-majors biology course (Human Biology - Bio8) that transfers to four-year institutions. This course satisfies GE requirement, CSU area B2 and B3 transfer breadth requirements, and IGETC. ○ Bio 5 is now offered in an online format and has been converted from HBA lab hours to scheduled lab hours. ○ Bio 7 is now offered in more sections (each semester). ○ Bio10 has been converted from HBA lab hours to scheduled lab hours. ○ Bio30 is now offered at the Brentwood Center and has been converted from HBA lab hours to scheduled lab hours. ○ Bio20 and 21 are offered in more sections at LMC and the Brentwood Center (each course offered each semester) ○ Bio50 is now offered in more sections. <p>Some of the key factors for success in expanding course offerings were funding (HSI STEM grant) and the hiring and maintenance of full-time faculty. Specifically, the HSI STEM grant played a key role in offering more sections of the majors biology courses (Biology 20 and 21), as well as supporting us in integrating a research experience in Biology 21.</p>
<p>Were there any goals that did not go according to plan? What were the key elements that impeded the progress on these goals?</p>	<p>Biology Learning Center (BLC) conversion to functional lab space was not accomplished due to lack of funding by management. In order to do this it would require funds for equipment and staffing.</p>

Other things not accomplished were the repair of classrooms and lab areas. For example, cabinets in lab rooms were not fixed, new locks on cabinets were not installed, and walls were not repainted/fixed.

9.2. Consider the College’s Strategic Directions & Integrated Planning Goals listed here:

College Strategic Directions 2014-2019	Integrated Planning Goals
<p>1. Increase equitable student engagement, learning, and success.</p> <p>2. Strengthen community engagement and partnerships.</p> <p>3. Promote innovation, expand organizational capacity, and enhance institutional effectiveness.</p> <p>4. Invest in technology, fortify infrastructure, and enhance fiscal resources.</p>	<p>1. ACCESS: increase access through enrollment of students currently underserved in our community.</p> <p>2. IDENTIFYING PATHWAYS: Increase the number of students that define a goal and pathway by the end of their first year.</p> <p>3. COLLEGE-LEVEL TRANSITION: Increase the number of students successfully transitioning into college level math and English courses.</p> <p>4. PERSISTENCE & COMPLETION: Increase successful course completions, and term to term persistence.</p> <p>5. EQUITABLE SUCCESS: Improve the number of LMC students who earn associates degrees, certificates of achievement, transfer, or obtain career employment.</p> <p>6. LEARNING CULTURE: Enhance staff, faculty and administration’s understanding and use of culturally inclusive practices/pedagogy, demonstrating empathy and compassion when working with students.</p>

List 3 – 5 longer term (5 year) new goals for your program. For each goal, pick 1 – 2 College Strategic Directions and/or 1 – 2 Integrated Planning Goals to which your new goal aligns.

Goals	Aligned College Strategic Direction(s)	Aligned Integrated Planning Goal(s)
<p>Goal 1: Continue to support and explore skills developed by students in the Biology program with those emphasized at transfer institutions and in the STEM workforce.</p>	<p>1. Increase equitable student engagement, learning, and success.</p>	<p>5. EQUITABLE SUCCESS: Improve the number of LMC students who earn associates degrees, certificates of achievement, transfer, or obtain career employment.</p> <p>6. LEARNING CULTURE: Enhance staff, faculty and administration’s understanding and use of culturally inclusive practices/pedagogy, demonstrating empathy and compassion when working with students.</p>
<p>Goal 2: Expand Biology Department offerings at the Brentwood Center after the new facility is built.</p>	<p>1. Increase equitable student engagement, learning, and success.</p> <p>3. Promote innovation, expand organizational capacity, and enhance institutional effectiveness.</p>	<p>1. ACCESS: increase access through enrollment of students currently underserved in our community.</p> <p>5. EQUITABLE SUCCESS: Improve the number of LMC students who earn associates degrees, certificates of achievement, transfer, or obtain career employment.</p>

<p>Goal 3: Meet the equipment, maintenance, and supply needs of current and future lab curricula department-wide, including conversion of SCI-103 to a fully functional wet lab.</p>	<p>1. Increase equitable student engagement, learning, and success.</p> <p>4. Invest in technology, fortify infrastructure, and enhance fiscal resources.</p>	<p>4. PERSISTENCE & COMPLETION: Increase successful course completions, and term to term persistence.</p> <p>5. EQUITABLE SUCCESS: Improve the number of LMC students who earn associates degrees, certificates of achievement, transfer, or obtain career employment.</p>
<p>Goal 4: Make a successful transition to the new compressed calendar format in a manner consistent with excellent pedagogy, with minimal impact on FTES.</p>	<p>1. Increase equitable student engagement, learning, and success.</p>	<p>4. PERSISTENCE & COMPLETION: Increase successful course completions, and term to term persistence.</p> <p>5. EQUITABLE SUCCESS: Improve the number of LMC students who earn associates degrees, certificates of achievement, transfer, or obtain career employment.</p>

OPTIONAL

9.3 Resource needs to meet five-year goals

<u>Faculty/Staff Resource Request</u>			
Department/Unit Goal - Reference #		Strategic Objective - Reference #	
Goal 2		1, 3	
Department/Unit Name		Position Name/Classification	FTE
1. Biology		Biology Lab Coordinator	1.0
2. Biology		Assistant Professor of Biology (2)	2.0
Position Type			
1. Full-time Classified Staff			
2. Full-time Faculty			
Justification:			
<p>1. FT Classified Position At the current Brentwood Center, there is one shared lab tech that manages the single science lab. In the new Brentwood Center, there will be four science labs, and a great increase in the variety and complexity of preps. A dedicated biology-only FT lab coordinator is needed to full-time manage the biology labs at the new Brentwood Center. We intend to offer a variety of prep-intensive courses across the biology curriculum, including bio majors, non-majors, and pre-healthcare courses.</p> <p>2. FT Faculty positions Currently, we have one FT faculty member assigned to the Brentwood Center. When we expand our offerings there as the new center opens to encompass a wider range of courses across the Biology curriculum, we will need additional staff to coordinate these courses. We anticipate a need for two additional FT faculty members, as well as additional adjunct professors to staff the added courses.</p>			

Operating Resource Request

Department/Unit Goal - Reference #

Strategic Objective - Reference #

Goal 3

1, 4

Goal 2

1, 3

Department/Unit Name

Resource Type

Biological Sciences

Lab Equipment, Supplies, and Repair

General Description

1. Maintenance of current lab facilities in Pittsburg and Brentwood.

2. Maintenance of newly converted/constructed lab facilities in Pittsburg and Brentwood.

Justification:

1. Maintenance of current lab facilities in Pittsburg and Brentwood: As cost-of-living and minimum wage continue to increase in the Bay Area, so do the costs of supplies and equipment needed to keep our labs functional and learner-centered. Maintenance of equipment (refrigerators, freezers, incubators, etc) will also continue to rise.

2. Maintenance of newly converted/constructed lab facilities in Pittsburg and Brentwood: With the conversion of the SCI-103 space to a fully functional wet lab at our Pittsburg campus, we will need to purchase baseline equipment and materials to run lab sections in this space and maintain this equipment.

The construction of the new Brentwood Center will also entail the purchasing of baseline supplies (which we assume would not need to be justified in this resource request); we will need funds to maintain and replace equipment and supplies in our three new labs here as well.

Professional Development Resource Request

Department/Unit Goal - Reference #

Strategic Objective - Reference #

Goal 1
Goal 4

1
1

Department/Unit Name

Resource Type

Biological Sciences

Science pedagogy and lab skills training

General Description

1. Professional development for effective pedagogical interventions (in longer class sessions)
2. Professional development for lab and research skills development

Justification:

1. Professional Development for Effective Pedagogical Interventions (Lecture-focused): As we move to compressed calendar, we will need to explore innovative pedagogical practices for engaging students over long time periods, and potentially, in the future, in hybrid models of teaching. Such best practices can be obtained by attending in-person and virtual conferences, workshops, and in-house training, as well as referencing materials (journal articles, workbooks, etc) to enhance our department's pedagogical practices.

2. Professional Development for Lab and Research Skills (Lab-focused): The skills students develop in our lab courses are critical components in training to continue the STEM academic pathway and enter the STEM professional workforce. Biological and biochemical lab and field techniques change at a fast pace, which means we need funding to continue developing our lab skills as instructors and pass on current knowledge and techniques to students. Immersive workshops and research experiences offered throughout the school year and during the summer are the best places to learn alongside other higher education educators and professionals. Workshop registration, along with travel, accommodations, and food expenses, necessitate funding.