

# LMC Comprehensive Program Review

## Instructional Units

2017-2018

Program/Discipline: Physics

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 complete Physics 40 sequence is now taught at the Brentwood Center in addition to being available on the main campus.

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?

PHYS 40 is currently taught at the Brentwood Center during the spring semester. We intend to offer PHYS 40 during both semesters in the future.

The Physics budget is woefully underfunded at only \$531 per year. It always runs out before the end of the semester.

The Physics program at the Brentwood Center is already in need of a dedicated budget for consumables as well as for maintaining and repairing equipment. We also need to acquire demonstration equipment for the Brentwood Center. At the moment, the Brentwood professor has to drive to the main campus to borrow the equipment, and then return to the main campus to return the equipment.

### 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:

Physics AS-T				
Semester	Semester 1	Semester 2	Semester 3	Semester 4
<b>All listed courses are 4 units each.</b>	MATH 50	PHYS 40 MATH 60	PHYS 41 MATH 70	PHYS 42

### 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.  
N/A

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?  
N/A

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
PHYS 40	3	3	3	3
PHYS 41	2	2	2	2
PHYS 42	2	2	2	2
Rationale for any Major Changes				
<p>We feel that an increase in the number of classes is appropriate, as all of these sections are overloaded. In at least two sections that are considered full with 24 students, we have about 32 students. We also wish to structure the offerings so that students have access to any of these courses during both semesters.</p> <p>We also are experiencing overcrowding in our Monday, Wednesday, Friday section of PHYS 15. Many students are sitting on metal folding chairs or standing throughout the class session.</p>				

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#### 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
PHYS 41	Jeanne Bonner/Kurt Crowder
PHYS 42	Jeanne Bonner/Kurt Crowder

##### 4.2. Course Offerings/Content

How have your courses changed over the past 5 years (new courses, significant changes to existing courses)?	The courses themselves have not undergone large changes, but the PSLOs have been revised.
How have these changes enhanced your program?	The new PSLOs will permit us to focus more on student needs.

#### 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.

## 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. All courses have been assessed, including PHYS 37, which the document incorrectly claims has not been assessed. The assessment can be resubmitted at any time if requested.

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: 2.5 Parts of 2 and 3 are correct for different CSLOs/Courses.

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: 2.2 There have been useful results, but usually not beyond what was already known before the assessments were given, and there have been times when we "created more questions than answers".

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: 2 We had too many PSLOs, but we will have fewer, but better, PSLOs in the future.

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.

7.1.4. What changes in the assessment process itself would result in more meaningful data to improve student learning? We need to rewrite our CSLOs. The current CSLOs are focused on content more than on the desired student abilities. They are not currently aligned with our PSLOs, but when they are aligned, we expect the new CSLOs to help us to create more meaningful assessments.

7.1.5. Share an outcome where assessment had a positive impact on student learning and program effectiveness. In assessing PSLOs, it was discovered that the lab assessment (which required the students to plan how to set up the apparatus and what measurements to make) was an effective teaching technique in itself. We intend to do more of the “assessment-like” labs in the future, as the students were much more deeply involved with thinking through the various problems associated with the lab.

## 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. We have far too many PSLOs. We will be reducing them from 8 to 5.

7.2.2. What was the biggest challenge in conducting program level assessment? We had too many PSLOs, including some that were not as important as the others and some that were really just special cases of the other PSLOs. Wording assessment problems in a manner that the students would understand was sometimes a problem, but that should improve as we gain more experience in assessing the program.

7.2.3. What resource needs, if any, were identified in your program level assessment? There are ongoing resource needs, but that has been apparent before doing any program level assessments.

## 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
<b>Completion Rate (Physics)</b>	83.3%	92.8%	93.1%
<b>Success Rate (Physics)</b>	72.2%	87.4%	87.4%

African-American students have lower completion rates and success rates than the student population as a whole. It appears that low income by itself is not a major impediment to completion rates or success rates.

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

These numbers vary significantly from year to year and from semester to semester. African-American students had a higher than average course completion rate in the fall of 2014, the spring of 2015, and in the spring of 2016. The course success rate of African-Americans, however, has been lower than the school average for all semesters given, except for the fall of 2014. Part of the variability is probably due to the relatively small number of African-Americans who are currently going through the Physics program.

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? We do not claim to be experts in solving these problems. We would like to see more FLEX workshops with experts who understand the perspective of African-Americans and foster youth. Low-income by itself does not appear to be as large of an issue in the Physics program. That may well be because of the excellent results brought about by the MESA program and the STEM Scholars initiative. MESA will undoubtedly also be a part of the solutions to the problems identified above.

## 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.

<p>Highlight some of the key goals that were achieved over the past 5 years. What were the key elements that led to success?</p>	<p>One objective, “Restore the 11% pay and work time that was cut from our Science Laboratory Technician.”, has finally been achieved. The key element to success was an improved campus budget for the college.</p> <p>Another objective was, “Purchase new equipment and provide training to instructors to improve students’ laboratory experience.” The STEM grant helped with this, especially in setting up the Physics lab at the Brentwood Center. However, we continue to have a need for the resources to purchase, maintain and repair lab equipment, at the main campus and even for the Brentwood Center.</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>Maintain lab equipment in a fully functional state. We need to acquire new equipment on the main campus. We need to establish a full-time budget dedicated to maintaining and repairing equipment at the Brentwood Center. These issues have not been addressed adequately for lack of funding.</p>

### 9.2. Consider the College’s Strategic Directions along with our 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,</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>

and enhance fiscal resources.	<p><b>4. PERSISTENCE &amp; COMPLETION:</b> Increase successful course completions, and term to term persistence.</p> <p><b>5. EQUITABLE SUCCESS:</b> Improve the number of LMC students who earn associates degrees, certificates of achievement, transfer, or obtain career employment.</p> <p><b>6. LEARNING CULTURE:</b> Enhance staff, faculty and administration’s understanding and use of culturally inclusive practices/pedagogy, demonstrating empathy and compassion when working with students.</p>
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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)
Increase the number of course sections to relieve overcrowding in the PHYS 40 sequence and in PHYS 15.	1 & 3	1 & 5
Hire another full-time Physics professor.	1 & 3	1 & 5
Acquire \$3000 for a one-time purchase of equipment to replace older equipment, augmenting existing equipment to address increased class sizes, and for repairing broken equipment.	1 & 3	1 & 5
Obtain a dedicated budget for buying, repairing and maintaining equipment at the Brentwood Center.	1 & 3	1 & 5

**Commented [HC1]:** May I suggest the following:

Goal 2: Invest in human resource to sustain excellent teaching

Goal 3 and Goal 4: Have appropriate facilities resources to appropriately teach our courses in both Pittsburg and Brentwood Center

The way the current goal 2 to 4 stated how to get there.

Just a thought!

**OPTIONAL**



9.3 Resource needs to meet five-year goals

Faculty/Staff Resource Request			
Department/Unit Goal - Reference #		Strategic Objective - Reference #	
Physics / #2		1 & 3	
Department/Unit Name		Position Name/Classification	FTE
Physical Science/Physics		Full-time Professor	1.00
Position Type	Funding Duration	Funding Source	Est. Salary & Benefits
<input checked="" type="checkbox"/> Faculty R/T <input type="checkbox"/> Classified <input type="checkbox"/> Manager <input type="checkbox"/> Student	<input checked="" type="checkbox"/> On-going/Permanent <input type="checkbox"/> One-time	<input type="checkbox"/> Operations (Fund 11) <input type="checkbox"/> Other <input type="text"/>	\$130,000
Justification:			
<p>There is enough load distributed through our current part-time faculty for at least one new full-time Physics professor. In addition, at least 4 sections are filled up well beyond the normal maximum.</p>			

Operating Resource Request		
Department/Unit Goal - Reference #		Strategic Objective - Reference #
3		1 & 3
Department/Unit Name		Resource Type
Physical Science/Physics		<input checked="" type="checkbox"/> Equipment <input type="checkbox"/> Supplies <input type="checkbox"/> Service/Contract <input type="checkbox"/> IT Hardware/Software <input type="checkbox"/> Facility Improvement <input type="checkbox"/> Other
General Description		Est. Expense
Acquire funding for a one-time purchase of equipment to replace older equipment, augmenting existing equipment, and for repairing broken equipment.		\$3000
Justification:		

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We currently have a patchwork of lab equipment from different vendors. Some of it works, and much of it needs to be repaired or replaced. We do not have enough equipment to accommodate current class sizes. It is best to perform the labs with 2-person teams. Unfortunately, 3 and 4 person teams are becoming the norm, which is not as conducive to student participation and learning.

**Operating Resource Request**

Department/Unit Goal - Reference #		Strategic Objective - Reference #	
4		1 & 3	
Department/Unit Name		Resource Type	
Physical Science/Physics		<input checked="" type="checkbox"/> Equipment <input checked="" type="checkbox"/> Supplies <input type="checkbox"/> Service/Contract	<input type="checkbox"/> IT Hardware/Software <input type="checkbox"/> Facility Improvement <input type="checkbox"/> Other
General Description			Est. Expense
Obtain a dedicated budget for buying, repairing and maintaining equipment at the Brentwood Center.			\$500/year
Justification:			
<p>There is no lab demonstration equipment at the Brentwood Center. Currently, the professor must make two trips from Brentwood to the main campus to 1. Pick up the equipment, 2. To return it.</p> <p>In addition, the equipment for student lab experiments is now becoming more worn and in need of maintenance and repair. We also have consumables that will need to be replaced in the near future.</p>			

**Professional Development Resource Request**

Department/Unit Goal - Reference #		Strategic Objective - Reference #	
Department/Unit Name		Resource Type	
		<input type="checkbox"/> Conference/Meeting <input type="checkbox"/> Online Learning <input type="checkbox"/> Other	<input type="checkbox"/> Materials/Supplies <input type="checkbox"/> IT Hardware/Software
General Description			Est. Expense

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<b>Justification:</b>	