LMC Comprehensive Program Review

Instructional Units

2017-2018

Program/Discipline: Math Developmental Education

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). *We have no changes in degree offerings. We will now be offering a non-credit Certificate of Competency – Elementary Algebra and Arithmetic. A major change in the last 5 years has been the introduction and expansion of the acceleration program in Statistics through the creation of Math 27 (Pre-Statistics) Math 28 (Math Skills for Success in Statistics) and Math 29 (accelerated Elementary and Intermediate Algebra).*

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? *No changes.*

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:

Elementary Algebra and Arithmetic Competency				
Semester	Semester 1	Semester 2	Semester 3	Semester 4
List Courses Needed for Degree or Certificate in each semester.	*Math 4 if necessary*	*Math 20*		

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**
Math 4		**1 Pitt**		**1 Pitt**
Math 12	**3 Pitt, 2 Brt**	**2 Pitt, 2 Brt**	**1 Pitt, 2 Brt**	**1 Pitt, 2 Brt**
Math 20	**1 Pitt**	**1 Pitt, 1Brt**	**1 Pitt, 1 Brt**	**1 Pitt, 1 Brt**
Math 25	**3 Pitt, 3 Brt**	**2 Pitt, 3 Brt**	**1 Pitt, 3 Brt**	**1 Pitt, 3 Brt**
Math 26	**2 Pitt, 1 Brt**	**2 Pitt, 1 Brt**	**2 Pitt, 1 Brt**	**2 Pitt, 1 Brt**
Math 27	**3 Pitt**	**2 Pitt**	**1 Pitt**	**1 Pitt**
Math 28	**6 Pitt, 2 Brt**	**6 Pitt, 2 Brt**	**7 Pitt, 2 Brt**	**7 Pitt, 2 Brt**
Math 29	**7 Pitt, 2 Brt**	**7 Pitt, 2 Brt**	**7 Pitt, 2 Brt**	**7 Pitt, 2 Brt**
Math 30	**6 Pitt, 4 Brt**	**6 Pitt, 4 Brt**	**6 Pitt, 4 Brt**	**6 Pitt, 4 Brt**
Rationale for any Major Changes				
Pittsburg rationale: Since Math 29 and 28/34 are now open entry, the need for the lower courses, Math 12, 25 and 27 should dwindle over time. Math 27 students would convert to Math 28 students. Math 12 and 25 students would convert to Math 29, although not all can because of scheduling issues. In general we do not see any significant growth in DE students over the next two years. Brentwood rationale: While offering their first Math 27 in Sp18, AB705 will make that unnecessary in the future.				

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
COURSE 001	*All are up to date*
COURSE 002	
COURSE 003	

4.2. Course Offerings/Content

How have your courses changed over the past 5 years (new courses, significant changes to existing courses)?	• ***We created Math 27, Pre-Statistics. This originally allowed students to bypass the algebra track to get more directly to statistics. We now offer 3 sections of it.*** • ***We created Math 28th the Stats support course. This allowed students who normally would not be able to complete statistics in one semester to finish stats in combination with Math 28.*** • ***We recreated Math 20, which is now an arithmetic and elementary algebra skills refresher course. This will allow students a quick review of these math skills to efficiently brush up on an as needed basis without taking the time for an entire math course emphasizing the other four PSLO's.*** • ***We created Math 29, the accelerated Algebras course. This allows students to complete their Elementary and Intermediate Algebra in one semester.***
How have these changes enhanced your program?	• *Students who only need statistics are more efficiently able to successfully complete their math academic goals. Success rates for students using the support courses are generally just as successful as those who did not need them, even though they had less algebraic background.* • *We have not had a chance to offer Math 20 yet, but we are hoping it help students step into Math 30 quickly.*

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.
We have assessed all courses on schedule.

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*

a. Delete the course
b. Market/promote the course to gain enrollments
c. Other

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 There are significant comments about what the students are having either difficulty or success with. The reasons for these difficulties is honestly explained. The follow through in terms of staff development, particularly in Math 26, is maybe not evident.

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: 3 The math department does a good job of collecting, analyzing and communicating results from assessment directed specifically at each of the CSLO's that are targeted. Not all CSLO's are looked at every assessment. In particular assessment of affective learning skills has only recently been addressed.

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: 2.5 With the exception of perhaps Math 26, both full time and adjunct faculty had the opportunity and had taken part in assessment.

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?

Be able to communicate out to future faculty what previous assessments focused on. Some changes deal with curriculum which can be changed for all instructors through packet rewrites. But other suggestions have to be carried out in the classroom individually.

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

Detailed analysis of the Math 29 assessment showed that the common final exam questions needed to be rewritten. Two had confusing contexts, one was unnecessarily checking graphing calculator lingo, and one used complicated units. These were changed for the next final exams.

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.

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

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

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 disproportionally 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.

Brentwood:

Afr. Am students **Completion**	Number	Percent
Fall 2014	58	80.6%
Spring 2015	64	74.4%
Fall 2015	57	78.1%
Spring 2016	40	60.6%
Fall 2016	45	66.2%
Spring 2017	33	57.9%

Low income students **Completion**	Number	Percent
Fall 2014	307	83.2%
Spring 2015	277	82.9%
Fall 2015	249	83.6%
Spring 2016	233	75.2%
Fall 2016	192	74.1%
Spring 2017	142	70.3%

All students **Completion**	Number	Percent
Fall 2014	491	82.8%
Spring 2015	451	85.1%
Fall 2015	425	83.8%
Spring 2016	374	77.1%
Fall 2016	330	78.4%
Spring 2017	266	76.7%

Afr Am students **success**	Number	Percent
Fall 2014	43	59.7%
Spring 2015	40	46.5%
Fall 2015	36	49.3%
Spring 2016	29	43.9%
Fall 2016	31	45.6%
Spring 2017	18	31.6%

Low income students **success**	Number	Percent
Fall 2014	233	63.1%
Spring 2015	211	63.2%
Fall 2015	189	63.4%
Spring 2016	169	54.5%
Fall 2016	137	52.9%
Spring 2017	99	49.0%

All students **success**	Number	Percent
Fall 2014	378	63.7%
Spring 2015	337	63.6%
Fall 2015	319	62.9%
Spring 2016	283	58.4%
Fall 2016	243	57.7%
Spring 2017	185	53.3%

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

Brentwood Completion:

We believe several factors are contributing to a decreasing overall number of completions in developmental math classes at the Brentwood Center from Fall 2014 to Spring 2017. First the economy has continued to improve, following the last economic downturn, resulting in more students going back to work and students taking fewer courses. Secondly, the math department has modernized our developmental math curriculum and placement process, resulting in more students taking transfer level math upon entry to college and more students completing developmental course work in a shorter period. This is great for students. Brentwood began offering Math 29 in Spring 2016 and Math 28 in Fall 2016. The edition of both of the courses has helped decrease the number of students taking developmental math in recent years at the Brentwood Center. We expect to see a similar increase in the number of completions of transfer level classes.

Additionally, in recent years the completion rates have also decreased. There are several possible explanations for this decrease. First, over the last 2 to 3 years, the department has lost a number of good adjunct instructors due to either retirement or full-time employment elsewhere. This has resulted in the necessity to hire new, less experienced faculty that are still learning and improving. Further professional development and seasoning should help improve instruction in the years to come. Second, as a result of the changes described above in placement and developmental course sequences, there are less students that are unnecessarily enrolling in developmental classes. Prior to this, under-placed students may have contributed to an artificial bump in success rates for lower level developmental courses.

Brentwood Success:

The sample indicates little difference between average success rates overall and those among low income students. The sample size is very small for African American Students taking transfer level math in Brentwood. This small sample size indicates significantly lower success rates for African American Students compared to the average success rates for all students.

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?

Brentwood math would like to move towards adopting open source texts for developmental math courses. We would like to use funding from the ZTC grant to work on finding texts that align with developmental math COORS. We would also like to improve professional development for new instructors teaching developmental math courses. Brentwood also looks forward to the completion of the new Brentwood Center in Spring/Summer of 2020. While there are currently many resources for students in Brentwood, the new center will give students better access to library resources, technology, and much more.

Success, Pittsburg:

Afr Am students **success**	Number	Percent		Low income students **success**	Number	Percent		All students **success**	Number	Percent
Fall 2014	237	51.4%		Fall 2014	595	57.2%		Fall 2014	792	56.1%
Spring 2015	175	43.2%		Spring 2015	482	51.7%		Spring 2015	626	52.9%
Fall 2015	165	45.6%		Fall 2015	492	50.4%		Fall 2015	687	51.8%
Spring 2016	127	46.5%		Spring 2016	419	54.4%		Spring 2016	562	55.1%
Fall 2016	113	42.5%		Fall 2016	400	54.2%		Fall 2016	605	57.2%
Spring 2017	113	50.7%		Spring 2017	349	60.6%		Spring 2017	497	60.0%

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

The parabolic pattern is pretty clear for African American, Low Income and All students. There seems to no statistical significance between the low income students and the students overall. (paired t test p = .13). However, there is an average of over ten percent gap between the African American and overall percentages. Their success rates in general are hovering around 50%.

There is a very clear trend in terms of numbers of students taking courses. Fall semester is definitely more popular with Developmental Math students than Spring, and the trend for numbers of students in just the last three years in Math DE in Pittsburg is way down across the board. This can probably be explained by the very significant increase in the number of students enrolled in the Transfer level courses. The sum of the transfer and DE student count is 1291, 1207, 1265 for consecutive fall semesters and 1057, 1029, 1064 for consecutive Spring semesters. So overall, totals are approximately steady. Rebalancing toward Transfer instead of Developmental courses, with comparable success rates, is great for students.

8.1 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 aim to use strategies cited in the CCCES report Aspirations to Achievement: Men of Color and Community Colleges:

- Creating classroom environments that foster a sense of belonging;
- Setting and maintaining high expectations through effective pedagogy;
- Engaging students in meaningful contextualized learning experiences;
- Communicating through interaction, class policies and materials that the instructor believes in each student's ability to succeed.

Useful resources would be the continuation of teaching community money, the modernization of the furniture and computer equipment in MA-202, the expansion of tutor training funds to help our tutors help others students with the technology and activity packets that, and the continued updating of activity packets, instructor teaching resources, and solution manuals.

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.

Pittsburg: Acceleration: instantiate accelerated offerings as an integral part of the program.

Towards this goal the program committee is working on several related activities:

- determining the optimal proportion of courses to be offered as acceleration and offering this many accelerated courses
- training faculty to teach accelerated courses
- research and potentially offer additional accelerated courses
- recruiting and orienting students
- communicating with counselors about offerings

Basic skills: restructure current basic skills offerings to meet the needs of different constituencies of students

- Review and revise placement logistics
- Revise foundational course
- Train faculty to teach revised foundational course

Learning outcomes: align instruction in developmental math courses with course and program learning outcomes

- Continue assessment practices, which include creation and use of rubrics based on course student learning outcomes
- Continue to provide professional development related to pedagogy, curriculum, and assessment

Highlight some of the key goals that were achieved over the past five years. What were the key elements that led to success?	• We have successfully integrated our algebra and stats accelerated courses. We have several sections of Math 29, accelerated elementary and intermediate algebra. Plus we will have the opportunity of bridging pre-algebra and elementary algebra skills in Math 20 starting in the summer. Our original plan of having several sections of Pre-stats, Math 27, was in the middle of blooming when the opportunity to create a stats co-requisite support course opened, and we pounced on it. So now instead we have several sections of the Math 28/34 combo sections. With the incredibly advantageous timing of the Transformation Grant, we have been able to create the curriculum and provide the staff development necessary to carry out a successful "combo" class. There are still difficulties with students and counselors understanding the complexities of the combo sections. This is understandable, given our curriculum and placement processes are moving targets.

	• Our placement process and placements have dramatically changed. We now have online placement, based mostly on multiple measure questions that best reflect current research connected to California student success. This has given us a placement process that no longer requires a math skills assessment test (but still offers one if wanted). • Math 4, our "foundational" course, was completely rewritten and class tested with a teaching community's support • We have continued our staff development through programs such as Ordered Pairs, teaching communities paid for through various sources, and we continue to assess our courses according to the assessment cycle.
Were there any goals that did not go according to plan? What were the key elements that impeded the progress on these goals?	To an extent, staff development is a little hit and miss. I hate to harp on the FT/PT ratio, but because we are always staffing sections with adjunct faculty, they are frequently unable to participate in department activities of any kind because they are always on the road at some other college half the week, and when they are here, they are teaching as much as they can. There are similar problems with educating a revolving group of counselors.

9.2 Consider the College's Strategic Directions along with our Integrated Planning Goals listed here:

College Strategic Directions 2014-2019	Integrated Planning Goals
1. Increase equitable student engagement, learning, and success. **2. Strengthen community engagement and partnerships.** **3. Promote innovation, expand organizational capacity, and enhance institutional effectiveness.** **4. Invest in technology, fortify infrastructure, and enhance fiscal resources.**	**1. ACCESS: increase access through enrollment of students currently underserved in our community.** **2. IDENTIFYING PATHWAYS: Increase the number of students that define a goal and pathway by the end of their first year.** **3. COLLEGE-LEVEL TRANSITION: Increase the number of students successfully transitioning into college level math and English courses.** **4. PERSISTENCE & COMPLETION: Increase successful course completions, and term to term persistence.** **5. EQUITABLE SUCCESS: Improve the number of LMC students who earn associates degrees,**

	certificates of achievement, transfer, or obtain career employment. **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.**

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.

Brentwood:

Goals	Aligned College Strategic Direction(s)	Aligned Integrated Planning Goal(s)
Goal 1: Adequately staff the math department with full time faculty so that at least fifty percent of courses are taught by full time faculty.	1, 3	1,2,3,4,5,6
Goal 2: Improve departmental use of data from lab/tutoring assessment research, including but not limited to training for student tutors and faculty tutoring in the math lab.	3	4
Goal 3: Find more open textbooks that align with developmental math courses to reduce costs for students.	1,3	1,4,5
Goal 4: Improve professional development for adjunct faculty for teaching developmental classes	1,3	4,6

Pittsburg:

Goals	Aligned College Strategic Direction(s)	Aligned Integrated Planning Goal(s)
Goal 1: Adequately staff the math department with full time faculty so that fifty percent of courses are taught by full time faculty.	1,3	1,2,3,4,5,6
Goal 2: Develop and expand our accelerated offerings through focused leadership, including student recruitment, curriculum, and professional development	1,2	1, 3,4
Goal 3: Design and implement a programmatic effort to support under-served students, including but not limited to students of color and low income students; coordinate our effort with other campus projects.	1	1,5

Goal 4: Improve departmental use of data from lab/tutoring assessment research, including but not limited to training for student tutors and faculty tutoring in the math lab.	3	4
Goal 5: Measure the effects of the new placement processes on Math 28, 29 and 30.	1,3	2, 3, 4, 5
Goal 6: Redesign Geometry to have it better align with Pre-Calculus and Calculus content.	1	4,5
Goal 7: Transform our use of instructional technology, with a potential shift away from calculators to computer/app based options	3,4	3, 4, 5
Goal 8: Have appropriate facilities resources to appropriately teach to our course outlines	4	4, 6

9.3 Resource needs to meet five-year goals

Faculty/Staff Resource Request

Department/Unit Goal - Reference #	Strategic Objective - Reference #	
1	1, 3	
Department/Unit Name	**Position Name/Classification**	**FTE**
Math Developmental Ed	Instructors	8

Position Type	Funding Duration	Funding Source	Est. Salary & Benefits
☑ Faculty R/T ☐ Classified ☐ Manager ☐ Student	☑ On-going/Permanent ☐ One-time	☑ Operations (Fund 11) ☐ Other	$560,000

Justification:

Both Pittsburg and Brentwood staff around 20% of the DE sections with Full timers. Let me repeat that: 20%. Part of that is because full timers partially shy away from teaching DE courses. But even if we hired 8 brand new instructors between Brentwood and Pittsburg in Math and had them teach mostly DE sections, we would be just making it to the FON number of 50% for this program.

Operating Resource Request

Department/Unit Goal - Reference #	Strategic Objective - Reference #	
8	4	
Department/Unit Name	**Resource Type**	
Math Dev Ed Program	☑ Equipment ☐ Supplies ☐ Service/Contract	☑ IT Hardware/Software ☐ Facility Improvement ☐ Other

General Description	Est. Expense
New furniture for MA2-202 and necessary new hard drives and monitors that fit in the new computer-flexible furniture.	$72,000

Justification:

We recently received funding to purchase and install all new furniture and computers for MA2-207 and MA2-208. Officially speaking, these rooms are directed toward STEM courses first. STEM transfer course offerings will continue to expand with the influence of AB705 shortening the time to complete any pre-requisite courses. We have MA2-203 as a solid Math combo and pre-stats room, but with no pre-requisite floor on the entrance to the combo sections, they will become all the more attractive. These courses require frequent use of computer technology. Also having MA2-202 as a full time Math classroom, Dev Ed students in sections spread throughout the main campus who frequently walk by the math building, will now be right at the top of the Math stairs, looking literally directly through the window into the Math Lab, both in the room and when stepping out of the classroom door.

Professional Development Resource Request

Department/Unit Goal - Reference #	Strategic Objective - Reference #
2, 3, 4, 5, 6, 7	3, 4, 5, 6
Department/Unit Name	**Resource Type**
Math Dev Ed	☑ Conference/Meeting ☑ Materials/Supplies ☐ Online Learning ☐ IT Hardware/Software ☑ Other

General Description	Est. Expense
Professional Development for acceleration curriculum, how to support students who AB705 has advanced into courses they would not have previously enrolled in without college experience, how to better reach students of color, the completely revamped Geometry course, and for faculty and student tutors who need to know how to tutor all the new curriculum, including online resources that replace graphing calculators.	$20,000 per year beyond our current institutionalized $10,000

Justification:

The Transformation Grant will be running out at the end of 18-19. While not all it paid for needs to be continued, a certain portion of it needs to be provided on a continuing basis, at least until the effects of acceleration, co-requisites, AB705, Guided Pathways, STEM emphasis, and the consistent inclusion of effective learning practices into our math curriculum is addressed. And that doesn't include things coming over the horizon that we haven't even begun working on yet (math coordination with a campus wide first year experience, significant expansion of our online offerings, in particular dealing with the difficulties of completing DE PSLO's online) and who knows what the future might bring.