PROGRAM REVIEW Fall 2017

Program: Mathematics
Division: MSEPS
Date: October 16, 2017
Writer(s): The Mathematics Department
SLO/SAO Point-Person: Jennie Graham

Audience: *Deans, Vice Presidents of Student Services and Academic Services, All Planning and Allocation Committees. This document will be available to the public.*

Uses: *This Program Review will be used to inform the campus and community about your program. It will also be used in the processes of creating Division Summaries, determining College Planning Priorities and allocating resources. A final use is to document fulfillment of accreditation requirements.*

Time Frame: *This Program Review should reflect on program status during the 2016-17 academic year. It should describe plans starting now and continuing through 2017-18. This document also provides the opportunity to describe more long-term plans (optional).*

Sections: *The first section of this Program Review focuses on general program reflection and planning. The second section is a review of curriculum. Only programs with curriculum need to complete Section 2. The third section is a CTE update, to be completed by CTE programs only.*

Topics: *A list of topics of particular interest to Program Review readers can be found here:* https://goo.gl/23jrxt

Help: *Contact Karin Spirn: kspirn@laspositascollege.edu*

Instructions:

1) *Please respond to each question as completely as possible.*
2) *If the requested information does not apply to your program, write "Not Applicable."*
3) *Optional: Meet with your dean to review this document before October 13.*
4) *Send an electronic copy of this form to Karin Spirn and your Dean by October 16*
5) Please note: Some information needed for this Program Review will become available in August 2017.

Links:

Program Review Home Page: https://goo.gl/XATgjJ
Fall 2016 Program Review Updates : https://goo.gl/YV8QOt
Frequently Asked Questions: https://goo.gl/iIhRtt

Section One: Program Snapshot

A. Data Review: Describe any significant changes to your program's data since last year's Program Review Update (Fall 2016).

Possible sources of relevant information might include, but are not limited to, the following:

- Data generated by your program
- Data from the Office of Institutional Research [available August 2017]
- CEMC Data
- Labor Market Data
- SLO/SAO Data

The number of students enrolling in our upper-level/transfer courses (Math 1, 2, 3, 5, 7, 10, 20, 34, 40) have been steadily increasing for the past three years. Waitlists on Math 40, 39, and 20 have been greatly impacted to the point that we were approved by CEMC to offer one additional section of each this past fall (with near-full classes) and will offer additional sections in the spring. Preliminary placement studies using Multiple Measures has also shown that more students place higher than in the past.

Math 50 success rates for 2016-17 are promising, with 64% of 264 students passing the course compared to 52% of 1,091 students passing Math 55.

Our hybrid Math 55, 65, and 40 courses have experienced high withdrawal rates over the years. Additionally, for most of the years studied between 2011 and 2017, students are succeeding at much lower rates than in the non-distance education modes. The department decided last year to eliminate the Math 55 and 65 hybrids that met in person only for tests, converting those sections to meet 2.5 hours one day per week. We will be examining the success rates for these courses in the coming years to see if the success rates are improving.

There has been some concern from faculty teaching the Math 39 Trigonometry course (first offered Fall 2016), in that students seem to have lower success than in the Math 38 Trigonometry & Geometry course offered previously. This was the first year offering Math 39, with success rate of 56% and withdrawal rate of 29%. If we compare this first year offering to the previous year's Math 38 success/withdrawal, the numbers are similar, with 51% success and 31% withdrawal. Looking at the aggregate Math 38 data since 2011-2012, we see that success for Math 38 averages at 56% with 27% withdrawal. Although the numbers are similar, the faculty concern is a valid one and we will be analyzing this data and considering professional development around best practices teaching trigonometry to help improve the success rates.

Math 1 and Math 2, our calculus sequence, had some significant curricular changes that were implemented fall 2016 to align with C-ID and be more compatible with Chabot's calculus sequence. In comparing success/withdrawal rates, the "new" Math 2 and 3 courses seem to be similar to the "old" Math 2 and 3 courses, where Math 1 in its first year seemed much more successful (by 10 percentage points) than the previous years:

Course	Math 1 2011-2016	Math 1 2016-2017	Math 2 2011-2016	Math 2 2016-2017	Math 3 2011-2016	Math 3 2016-2017
Success	58%	68%	60%	59%	64%	62%
Non-Success	15%	10%	17%	17%	18%	19%
Withdrawal	27%	22%	23%	24%	18%	19%

Success rates for Math X tended to be lower than lecture offerings of the same courses. This low success rate helped drive the change to Math Emporium. Success rates for Math Emporium will be monitored these next few years to see if the changes to this mode of offering raise our student

success levels to at least those of our lecture classes. National research on the various Emporium modes of offering show that success rates may decrease after the first year, but show rapid improvement after that. Ongoing evaluation of the Emporium mode will inform our progress.

Livermore Valley Joint Unified School District approached LPC last year for a Tutoring program for their high school students. Fall semester this course was offered through a grant for two years, and now over 50 students are enrolled. In the meantime, we will be considering how we can institutionalize this program.

In 2016-17, seven Mathematics AS-T degrees were awarded; this brings our total number of AS-T degrees awarded to 22 since first offering them in 2012-2013.

B. Changes to Program and Needs: Describe any significant changes to your program or your program's needs since the previous Program Review Update (Fall 2016).

Two full-time faculty will be retiring at the end of Fall 2017. Several of our current full-time instructors are working alternative duties in conjunction with teaching, including Curriculum Committee Chair, Professional Development Chair, Basic Skills Committee Chair, Coordinator of HSI Title V Grant or BSSOT Grant. We need consistent leadership and support from our full-time faculty to fulfill and maintain the multiple efforts that are planned for fall 2018 and beyond.

We hired three more part-time faculty this year, for a total of 47 part-time faculty. Each semester we recruit and hire new part-time faculty to teach our classes.

The Open Math Lab (OML) has been renamed to the Mathematics Learning Center! The MLC will be housed under the ILC, just as the OML was, and will continue to provide support to students in their math courses. This change is meant to help students differentiate between the MyMathLab online course management system and their TBA hour requirement to be held in the physical location of the MLC.

We recently implemented a more robust use of multiple measures (overall HS GPA, last math class with passing grade) for math placement. This could change our course offerings starting in Fall 2018 to include more transfer-level courses and fewer basic skills.

Livermore Valley Joint Unified School District approached LPC last year for a Tutoring program for their high school students. Fall semester this course was offered and now over 50 students are enrolled. The course is offered as a noncredit TUTR 200 course, currently with three faculty and six student tutors with the ability to hire more as the program grows.

This fall begins the pilot year for the Math Emporium mode for

Mark an X next to each area that is addressed in your response.

Definitions of terms: https://goo.gl/23jrxt

	Community Partnerships/Outreach
X	Curriculum*
X	Enrollment Management
	External Factors
X	Facilities,** Supplies and Equipment (Including Software)
	Financial/Budgetary
X	Human Resources
	Learning Support
	LPC Planning Priorities https://goo.gl/LU99m1
X	Pedagogy
	Professional Development
	Services to Students
X	SLO/SAO Process
	Technology Use

*Curriculum will also be addressed in Part 2 (Curriculum Review).

**Facilities will also be addressed in Question H.

our courses. Research and development of improvements to this self-paced mode of offering occurred during the two years prior to implementation this Fall, and involved several faculty and administrators. One 32-hour per week Senior IA was hired as of July 1, 2017 to help support the Math Emporium mode. However, the person in the 15-hour per week IA position left for a teaching position elsewhere at the beginning of the Fall 2017 semester. We are currently using a temporary hire to cover most of that position's hours, and are in the process of posting the position to hire a permanent replacement during the Spring 2018 semester. However, the loss brought to light the need to have more IA hours to help cover holes in the event that we lose staff support. As we come out of our budget crisis and the Math Emporium mode is proved to help increase student success, Math will put through RAC the need for an increase in our Sr. IA and PT IA hours. Math 3 is offered at a high school as a year-long course to help accommodate the large number of high school students completing Calculus BC junior year and wanting to continue in their math education. We redesigned the prerequisites for Math 1 Calculus, eliminating Math 20 Precalculus (which will be deactivated fall 2018) and adding two prerequisites of Math 39 Trigonometry and Math 30 College Algebra for STEM, which will begin Fall 2018. Starting fall 2018, Math 65 Elementary Algebra will become Math 110 Elementary Algebra, and the units will reduce from 5 to 4. Also, Math 55 Intermediate Algebra becomes "Intermediate Algebra for STEM", and emphasizes STEM applications throughout the course. The department discussed a rotation of our SLO recording and analysis to help imbed the process in our regular department discussions. Each of our CSLOs map to one of our five PSLOs: Multiple Representations, Communication, Problem Solving, Modeling, and Technology. (http://www.laspositascollege.edu/math/SLOs.php) This fall 2017, we're planning to discuss all Problem Solving SLOs, and we'll record data for Communication and Modeling. Next fall 2018 we'll discuss Communication and Modeling, and we'll record Multiple Representations. Fall 2019, we'll discuss Multiple Representations and Technology, and we'll record Problem Solving. Technology will be recorded every year, along with all SLOs for our courses that are only offered once a semester in order to accumulate sufficient data to have a meaningful discussion.	

C. Reflection: What plans from the 2016 Program Review Update or any previous Program Reviews/Updates have been achieved and how?

One full-time 32-hour per week Instructional Assistant was hired as of July 1, 2017, primarily to work in our new Math Emporium mode of learning. Thanks to this hire have nearly sufficient instructional assistant coverage for all of our Emporium courses. More overlap in our IA coverage would be ideal. The Sr. IA will also transition into supporting Math Jam before the Fall and Spring semesters.

This is the inaugural year of Math Emporium (for Math 55, 65, 51, 107)! We are using a computer monitoring software called Impero in the Emporium modes to ensure the integrity of the computerized testing. We would like to explore whether the use of the software could be expanded to the computer labs on campus. As part of the development of LPC's Math Emporium its coordinator reached out to faculty in the STEM disciplines to gather STEM applications to incorporate into the Emporium assignments. Conversations are continuing with the other STEM disciplines to create more content and opportunities for our students.

For our new Math 50 course, we reduced lecture to 3 units and attached a 3-hour lab. It is the same number of units to the students but more contact hours. The concern from the teaching faculty that students were not being successful drove this change.

We recently implemented a more robust use of multiple measures (overall HS GPA, last math class with passing grade) for math placement. Using the statewide recommendations as a guide and considering limitations in Accuplacer programming, we developed a placement guide for students that would fit into the programming constraints and without making substantial changes in the existing test. With help of a counselor familiar with the Accuplacer program and numerous conversations with District IT, counseling, and others, the changes were implemented on September 28 for partial spring placement.

The Math Club is offering more help for the AMATYC Student Math League Exam Competition. Also through Math Club, students attended the CMC3 Tahoe conference for 2 consecutive years, with plans for attending this spring.

Mark an X next to each area that is addressed in your response.

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**Facilities will also be addressed in Question H.

D. Impacts to Students (Optional): Discuss at least one example of how students have been impacted by the work of your program since the last Program Review Update (only if you did not already answer this in Questions A, B or C).

Math Jam is showing substantial success for students in many of our math courses. Overall, the success rates of Math Jam participants is 62% in their math class, compared to 56% for all students. In basic skills courses (107, 65, 55, 50), Math Jam students have a 65% success rate compared to 56% overall. Stem transfer courses (38, 39, 20, 34) have Math Jam students with a success rate of 68% compared to 61% overall. More specifically, Math Jam students each of the basic skills classes of 107 and 65 show a success rate that is 14 percentage points higher than the non-Math Jam students!	Mark an X next to each area that is addressed in your response.	
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	**Facilities will also be addressed in Question H.	

E. Obstacles: What obstacles has your program faced in achieving plans and goals?

Ongoing/Continuing from last PRU: • Programs offered in context of a specific discipline - Early Childhood Development cohort offering Math 107, 65, 55 was opened up to general student population - Engineering Technology cohort offering Math 55, 38, 20 was opened up to general student population but heavily marketed to STEM majors and learning communities (Puente, Umoja) Challenges as a result – these are no longer homogeneous groups of students with similar goal (in-context is not appropriate for some students) but with our high fill rates, these were the only classes available to some students. • We still need permanent funding for Math Jam, and a way to offer Math Jam <u>before</u>, instead of within, spring semesters. • We need funding for additional support in the Math Emporium Mode for a faculty coordinator with reassign time, increased hours of instructional assistant support,	Mark an X next to each area that is addressed in your response.	
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	X	Pedagogy
	X	Professional

etc, as well as the Mathematics Learning Center (formerly Open Math Lab) for a full-time coordinator/IA. This request for additional IAs for our department is meant to help us be more comparable to other colleges, adding consistency and cohesive support for our students in these facilities. (We currently have no IA support, full or part, in the MLC.) • We continue to struggle with adequate facilities: available classrooms and computer labs. The hardwire Ethernet also needs to be vastly improved for our classrooms. • A proctoring center is needed to help support our faculty with make-up exams and re-take exams for students and to support our DE courses, and expanded hours to supplement DSPS's proctoring. This would benefit the ***entire campus***, as any department giving exams could utilize this resource. We would need the facility and faculty/staff to support the proctoring center. • A centralized "Academic Support" center is desired, where the Integrated Learning Center/Open Math Lab, RAW center, Tutorial center, and Computer Lab (and possibly Math X and/or Library), are all located in the same building, to better serve our students. This facility has been discussed in Math's program reviews and in Task Force meetings since 2013. As a result of NOT having this central facility, there is a redundancy of support and our current support is spread too thin. This would be a great asset to our students as a "One-stop" shop for assistance in their classes across disciplines. – UPDATE: This has made it onto the Measure A priority list as of Fall 2017. • In terms of technology, our department would love to have classroom-monitoring software for all computer labs, more wireless hubs and hotspots, smart boards and/or wireless projectors, and investigation into e-manipulatives. • Our calculator rental program is very well utilized, with all of our calculators rented out to students each semester. We have continued to expand by adding calculators as we can afford them, but we are still in need of graphing calculators to rent. More of our courses are requiring these graphing calculators. **NEW or Recently Identified:** • An error with class capacity for two sections of Emporium caused two additional sections to be added (where there was no adequate facility to place them), which then caused some significant space-sharing with the Integrated Learning Center and created some confusion with students both in Emporium and some not in Emporium. We are concerned for our success data from the Emporium rollout, as this error can very easily skew results – students in different sections		Development Services to Students SLO/SAO Process X Technology Use *Curriculum will also be addressed in Part 2 (Curriculum Review). **Facilities will also be addressed in Question H.

don't have access to the same facility or support. • Noncredit sucks. We would like to offer noncredit courses, namely Math Jam at all levels and move PreAlgebra 107 to noncredit, as well as capture FTES for students using the Mathematics Learning Center when they do not have a TBA hour to complete or when they go over their required 17 hours. However, until the district and faculty union decide on reasonable compensation, we cannot put this curriculum through. • Replacing Greg and Teri is sad ☹ We will miss them terribly. • Facilities is still a struggle, especially with computer labs. There is hope with the opening of the new academic 1000 building that this will be alleviated. • Block Scheduling sucks. This confines our ability to schedule classes effectively and efficiently.	

F. Short Term Planning: What are your most important plans (either new or continuing) for next year?

• Professional Development for Math – CMC3, CMC, AMATYC, NAPA, HACU, MAA Golden Section, NCTM, Joint Mathematics Meetings (MAA/AMS); Student Success Conference; Northern CA Undergraduate Mathematics Conference • Deactivation of Precalculus Math 20 and College Algebra Math 45 • Revamp Math 65 to 110: Elementary Algebra to 4 units • Revamp Math 55: Intermediate Algebra for STEM • Shorten pathway to Calculus (Math 30 College Algebra for STEM + Math 39 Trigonometry will become prerequisites for Math 1 Calculus) • Offering Technical Mathematics pathway for Auto & Welding (+deactivation of Math 71A & B) starting Fall 2018 (Curriculum is moving through the process this semester) • Livermore High School Tutoring Course begins Fall 2017 • Math 3 is being offered as a year-long course at Amador Valley HS for the academic year Fall 2017-Spring 2018. • Materials and training in best practices for our Corequisite courses for Math 55 and Math 65 need to be developed • Analyze data for DE/hybrid courses • Analyze data for Emporium • Figure out how to offer Fast-Track courses • Develop curriculum for and offer some Smart Shop workshops around fractions, factoring polynomials, and calculator use. • This fall 2017, analyze all Problem Solving SLOs, and	Mark an X next to each area that is addressed in your response. Definitions of terms: https://goo.gl/23jrxt	
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record data for Communication and Modeling. Next fall 2018 discuss Communication and Modeling, and record Multiple Representations. Technology will be recorded every year, along with all SLOs for our courses that are only offered once a semester in order to accumulate sufficient data to have a meaningful discussion.	

G. Long Term Planning (Optional): Please detail any long-term plans for the next 3-5 years. (Only if you have significant plans, such as implementation of a grant project, creation of long-term initiatives including those using restricted funds such as Equity or SSSP, construction and outfitting of a new building).

The Basic Skills Student Outcomes and Transformations (BSSOT) Grant and Title V Gateway to STEM HSI Grant (HSI) have helped our department implement several high-impact initiatives that will go into effect Fall 2017 and Fall 2018.
For Fall 2017:

- Our self-paced mode of offering Math 107, 65, 55, and 71 known as Math X has been reimagined into the Math Emporium. While the same principle of learn at your own pace still applies, the way in which students will move through the material will be unique to their needs. Chapter testing will be completed on a computer instead of paper/pencil, reducing the wait time for a student to receive feedback.
- Multiple measures (HS GPA, last math class) will be used more significantly than in the past to place students into courses. Either the measure or Accuplacer score, whichever is higher, will determine students' placement. There is a partial roll-out in fall 2017, and every student taking the placement test for fall 2018 will be placed using the "new" multiple measures rules. The multiple measures are similar to the statewide multiple measures recommendations.

In Fall 2018:

- Corequisite support courses for Math 65 and Math 55 (Math 65C and Math 55C, respectively) plan to be offered as a mode of acceleration. Students who place one level below (i.e. Math 107 or Math 65) will be allowed to register for the next class up (Math 65 or Math 55, respectively) PLUS the corresponding corequisite course. Corequisite support courses have been gaining popularity and validation across the nation as a means of acceleration.
- We want to submit curriculum and two certificates for Math Jam as noncredit as a way to keep the course free to students but still pay the faculty for teaching. The grants have allowed us to research noncredit offerings (across the spectrum of programs, not just for

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math). • We want to submit curriculum for the High School Tutoring course for institutionalization. • We are planning to apply for an Instructional Assistant through RAC to be housed in the Open Math Lab to help the faculty working in the OML with student requests, as well as provide faculty with an additional point of regular contact. Near Future: • We hope to begin capturing noncredit FTES through the Open Math Lab when students in Statistics, Calculus, or other courses without a TBA lab hour come in and request help, and when students log more than their required 17 hours. • We want to offer Pre-Algebra as noncredit • An on-campus Reading Apprenticeship Program is planning to be implemented in the next 2-3 years, with two faculty (to be identified, ideally one in STEM and one in English/ESL) as coordinators. This training can greatly help our students across every discipline become better students, but especially assist faculty in helping students read math texts with heavy technical language, application problems, and "lab" assignments with better understanding. • Open Math Lab has been rebranded to the Mathematics Learning Center and "Lab Assignments" will be called Activities or TBA Assignments or Math Center Assignments (NOT MLAs, as this already has a meaning for citation!). This is to help with the confusion many students have between the Open Math Lab and MyMathLab (web-based course content system used by many instructors) • More robust training for OML instructors on Best Practices AND policies. • Development of core activities for each course that are available for all instructors to use/modify. These core activities may also include interactive modules and/or group collaboration.	

H. Do you have any facilities needs that are currently unmet? If yes, please describe.

• Emporium classroom space is limited – no availability to expand course offerings if we needed or wanted; wired Ethernet within Emporium classroom is limiting; even increasing capacity in current classroom is impossible as the last row of computers is needed for testing. • Computer labs – the lab spaces are at maximum usage, severely hindering the ability to schedule additional classes that need computers. • Classroom space – also very limiting, as one-day-per-week courses scheduled ineffectively end up blocking the ability for other courses needing two-day-per-week meetings to be scheduled in a given classroom.

- MLC and Tutorial Center are too far away; we duplicate instead of support each other.
- Proctoring Center is desperately needed to support all of our classes, instructors and students, not just math.
- MLC is too loud – not enough quiet spaces or computers; (bldg. used to be Music practice hall). (ESL sharing is nice for collaboration, but makes the room louder as they need to talk.)

I. Mission: Explain how your program's plans and accomplishments support the mission of Las Positas College:

Las Positas College is an inclusive learning-centered institution providing educational opportunities and support for completion of students' transfer, degree, basic skills, career-technical, and retraining goals.

The Mathematics Department serves multiple levels of students (transfer, degree, basic skills, career-technical) with math classes necessary to their goals. We pride ourselves on our support for students in the Mathematics Learning Center (formerly the Open Math Lab), where students can "come for the lab, stay for the help" and get just-in-time assistance from a math faculty in almost any math course. We are considering and/or implementing several best practices as identified by the CA Chancellor's Office (and nationwide) shown to close the achievement gaps of multiple underrepresented groups and propel our students to complete their math requirements faster.

J. Program-Set Standard (Instructional Programs Only): Did your program meet its program-set standard for successful course completion? ____yes ____no

[This data will be available in August 2017]

If your program did not meet your program-set standard, discuss possible reasons and how this may affect program planning or resource requests.

N/A

K. SLOs/SAO Reflection: Describe an example of how your program used course SLO data (CSLOs), Student Service Area Outcome (SAO) data or Program SLO data (PSLOs) from last year (2016-17) to impact student learning or achievement. <u>Focus on PSLOs or CSLOs where you have multiple semesters of data to analyze</u>. (Copy the box below if you would like to discuss multiple examples.)

Course Name, Program Name or Student Service Area: **Math 1**
Text of the CSLO, SAO, or PSLO: **Upon completion of Math 1, a student should be able to integrate a function involving a u-substitution.**
Describe the quantitative or qualitative results: *Upon completion of Math 1, a student should be able to integrate a function involving a u-substitution.*

	Mastery		Above Average		Average		Below Average		No Demonstrated Achievement		N/A		Total	
Spring 2017	21	22.58%	15	16.13%	17	18.28%	33	35.48%	6	6.45%	1	1.08%	93	100.00%
Fall 2016	28	40.58%	20	28.99%	6	8.70%	4	5.80%	9	13.04%	2	2.90%	69	100.00%
Totals	**49**	**30.25%**	**35**	**21.60%**	**23**	**14.20%**	**37**	**22.84%**	**15**	**9.26%**	**3**	**1.85%**	**162**	**100.00%**

About 77% of students scored average or above average for this SLO over the year.

Discuss and reflect upon student achievement for this CSLO/PSLO/SAO. Discuss any actions taken so far (and results, if known) and your action plan for the future:

The curriculum change in Math 1 was implemented Fall 2016, so there is more time to focus and learn concepts. The textbook has been changed beginning Fall 2017; we will be analyzing SLOs to see if this change helps improve mastery of the SLOs.

What changes in student achievement are evident across the semesters you analyzed? What are some possible explanations for these changes in student achievement?

One more section of Math 1 in Spring than Fall; Middle college (high school) students are enrolling in these courses.

L. Plans for Analysis of SLO/SAO Data: Identify the PSLOs, CSLOs, or SAOs that your program plans on focusing on the upcoming year with subsequent analysis. (Copy the box below as needed.)

Circle One:

CSLO (PSLO) SAO

Course, Program Name, or Student Service Area:

Mathematics

Text of CSLO/PSLO/SAO:

Students will use mathematical reasoning to solve problems and a generalized problem solving process to work word problems.

If you plan on analyzing a PSLO, identify the CSLOs that feed into the PSLO that will need to be assessed.

- Upon completion of Math 1, a student should be able to integrate a function involving a u-substitution.
- Upon successful completion of Math 2, a student should be able to integrate a function using a partial fraction expansion.
- Upon successful completion of Math 3, a student should be able to evaluate a surface integral.
- Upon successful completion of Math 5, a student should be able to use the method of Laplace transforms to solve a differential equation.
- Upon successful completion of Math 7, a student should be able to diagonalize a matrix.
- Upon successful completion of Math 10, a student should be able to use mathematical reasoning and counting techniques to correctly enumerate the number of ways in which a specified event can occur.

- Upon successful completion of Math 10, a student should be able to determine whether a relation is an equivalence relation.
- Upon successful completion of Math 20, a student should be able to find all zeros of a polynomial function.
- Upon successful completion of Math 33, a student should be able to solve a system of linear equations in matrix form by hand (without using a calculator).
- Upon successful completion of Math 34, a student should be able to evaluate a definite or indefinite integral symbolically by hand using the technique of substitution.
- Upon successful completion of Math 38, a student should be able to solve a trigonometric equation using factoring and identities.
- Upon successful completion of Math 39, a student should be able to solve a trigonometric equation using factoring and identities.
- Upon successful completion of Math 40, a student should be able to solve an application problem using the central limit theorem.
- Upon successful completion of Math 45, a student should be able to find the real zeros of a polynomial function.
- Upon successful completion of Math 47, a student should be able to solve a financial problem involving amortization.
- Upon successful completion of Math 50, a student should be able to determine the domain of a function.
- Upon successful completion of Math 55, a student should be able to determine the domain of a function.
- Upon successful completion of Math 55A, a student should be able to determine the domain of a function.
- Upon successful completion of Math 65, a student should be able to solve a polynomial equation using factoring techniques.
- Upon successful completion of Math 65B, a student should be able to solve a polynomial equation using factoring techniques.
- Upon successful completion of Math 71A, a student should be able to perform a unit conversion.
- Upon successful completion of Math 71B, a student should be able to solve problems involving trigonometric ratios.
- Upon completion of Math 107, a student should be able to perform order of operations to simplify expressions involving signed integers.
- Upon completion of Math 107, a student should be able to solve an algebraic equation.
- Upon completion of Math 107A, a student should be able to perform order of operations to simplify expressions involving signed integers.
- Upon completion of Math 107B, a student should be able to solve an algebraic equation.

Section Two: Curriculum Review
(Programs with Courses Only)

The following questions ask you to review your program's curriculum. To see the last outline revision date and revision due date:

1. Log in to CurricUNET
2. Select "Course Outline Report" under "Reports/Interfaces"
3. Select the report as an Excel file or as HTML

Curriculum Updates

A. Title V Updates: Are any of your courses requiring an update to stay within the 5 year cycle? List courses needing updates below.

We are awesome. No courses need updating.

B. Degree/Certificate Updates: Are any degrees/certificates requiring an update to do changes to courses (title, units) or addition/deactivation of courses? List needed changes below.

Mathematics AS-T – update courses
Liberal Arts & Sciences AA – Math/Science emphasis – update courses

We want to create two new noncredit certificates for Math Jam

C. DE Courses/Degrees/Certificates: Detail your department's plans, if any, for adding DE courses, degrees, and/or certificates. For new DE degrees and/or certificates (those offered completely online), please include a brief rationale as to why the degree/certificate will be offered online.

N/A

Section Three: CTE Updates
(CTE Programs Only)

A. Labor Market Conditions: Examine your most recent labor market data. Does your program continue to meet a documented labor market demand? Does this program not represent unnecessary duplication of other training programs in the college's service area? (Please note: your labor market data should be current within two years. Contact Vicki Shipman or the current CTE Project Manager for access to data).

N/A

B. Advisory Boards: Has your program complied with advisory board recommendations? If not, please explain.

N/A

C. Strong Workforce Program Metrics: Utilizing LaunchBoard, review the Strong Workforce Program Metrics. Review the data and then answer the following questions.

(Contact Vicki Shipman or the current CTE Project Manager for help accessing the data).

C1. Does your program meet or exceed the regional and state medians **for increased enrollments, completions, and/or transfer since your last program review**? If not, what program improvements may be made to increase this metric?

N/A

C2. Does your program meet or exceed the regional and state medians **for students gaining employment in their field of study**? If not, what program improvements may be made to increase this metric?

N/A

C3. Does your program meet or exceed the regional and state medians **for student employment rates after leaving the college**? If not, what program improvements may be made to increase this metric?

N/A

C4. Does your program meet or exceed the regional and state medians **for increased student earnings and median change in earnings?** If not, what program improvements may be made to increase this metric?

N/A