Program: Mathematics

Division: MSEPS

Date: September 30, 2016

Writer(s): The Mathematics Department

SLO/SAO Point-Person: Craig Kutil

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

Purpose: To document significant program accomplishments, plans and needs between Triennial Program Reviews. This update should provide a snapshot of your program.

Uses: This update will be used to inform the campus and community about your program. It will also be used in the processes of creating Dean's Summaries, determining College Planning Priorities and allocating resources.

Time Frame: This update should reflect on program status during the 2015-16 academic year. It should describe plans starting now and continuing through 2017-18.

Topics: The first section of this Program Review Update focuses on general program reflection and planning. The second, third and fourth sections focus on reflection and planning regarding Student Learning Outcomes. Only instructional programs need to complete Sections 2, 3, and 4.

Scope: While this Program Review Update does ask for some analysis of data, detailed data reports in the form of appendices should be reserved for the Triennial Program Review.

Instructions:

1) *Please fill in the following information as completely as possible.*

2) *If the requested information does not apply to your program, please write "Not Applicable."*

3) *Optional: Meet with your dean to review this document before October 10, 2016.*

4) *Send an electronic copy of this form to the Program Review Committee Chair and your Dean by October 10, 2016.*

Part One: Program Snapshot

A. Have there been any significant changes to your program, your program's data or your program's needs since the previous Program Planning Update?

If there are any changes, describe the relevant information and its significance in the space below.

These changes might have originated from within the program or because of an external source (the institution or the state, for example). 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 (http://goo.gl/Ssfik2)
- CEMC Data
- Retirements
- State Mandates
- Labor Market Data
- SLO/SAO Data (http://goo.gl/jU2ylZ)

1. New Initiatives:
   - We successfully offered Math 50 (in Fall 2016): Core Intermediate Algebra as a non-STEM alternative to Math 55.

- We created Math 39: Trigonometry, a 4-unit course, to replace our 5-unit Math 38: Trigonometry with Geometry. Math 39 is being offered this Fall 2016.
- We rewrote curriculum for Math 1, 2, and 3 to better align with Chabot's Calculus sequence, and we removed the TBA lab hour from Math 1 and Math 2.

2. New Full-time and Part-time hires
   - Fall 2015, three new full-time faculty started (2 replacements for retirements, one new position), and Fall 2016, two new full-time faculty started (replacements for retirements)
   - Part-time math faculty is approximately 40 people
   - Temporary Instructional Assistant hired for Fall 2016 for Math X Program

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3. We have offered classes at the District office (i.e. Math 40 in fall 2016)
4. Programs offered in context of a specific discipline
   - Early Childhood Development cohort offered Math 107, 65, 55 or 50, 47 was opened up to general student population
   - Engineering Technology cohort offered from Math 55, 38, 20 was opened up to general student population but heavily marketed to STEM majors
5. Hours in the Integrated Learning Center were extended to 8:30pm for Monday-Thursday, and to 12:30pm or 1:00pm (depending on semester) on Friday.
6. The department was awarded two grants (HSI and Basic Skills Transformations) that will impact us in terms of activities around non-credit support courses, Math Jam, professional development, assessment, and acceleration.
7. The Math Club/Math Honor Society organized and sponsored the attendance of 10 students to the spring CMC^3 recreational math conference at Lake Tahoe in April.

B. What objectives, initiatives, or plans from the 2015 Program Review Update have been achieved and how? PRUs from 2015 are available here: http://goo.gl/9iF3m9

We successfully redesigned Pre-Calculus/Trigonometry Sequence – courses are approved by the state and are currently being offered.
Blackboard and Math Department Websites are in a process of continuous improvement.
Math 50 is being offered for the first time this semester.

C. Discuss at least one example of how students have been impacted by the work of your program since the last program review update (if you did not already answer this in Question B).

Offering Math 47 last year was very successful for our non-STEM transfer students. Of 151 students over 5 classes taught by 4 different instructors in AY 2015-16, 79.5% passed (A, B, C), and 20.5% did not (D, F, W).

Math Jam has been helping over 350 students every year by improving success rates for students from basic skills through transfer. Math Jam has been consistently serving between 150 to 200 students each Fall and Spring. Each year more students are starting their math classes more prepared and excited to succeed than ever before! Students who attend Math Jam have significantly higher success and retention rates in their upcoming math classes than non-math jam participants. Jumpers are also more likely to succeed. This Fall 2016 we had 50 jumpers who took the ACCUPLACER Test on Friday and are now eligible for a math class 1, 2, and even 3 levels higher than they were at the start of the week. We will continue to analyze the success data, use it to improve the program and supports, and put our students' needs first as we support them in achieving their academic goals.

D. What obstacles has your program faced in achieving objectives, initiatives, or plans?

Programs offered in context of a specific discipline
- Early Childhood Development cohort offered Math 107, 65, 55 or 50, 47 was opened up to general student population
- Engineering Technology cohort offered from Math 55, 38, 20 was opened up to general student population but heavily marketed to STEM majors

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 are still needing permanent funding for Math Jam, and a way to offer Math Jam before spring semesters.

We need funding for additional support in the Math X program for a full-time coordinator, instructional assistant support, etc, as well as the 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 and similar-sized departments within LPC, adding consistency and cohesive support for our students in these labs. (We currently have NO full-time IA support in Math X, and no IA support, full or part, in OML.)

We continue to struggle with adequate facilities: available classrooms and computer labs. The hardwire Ethernet also needs to be vastly improved for our classrooms.

The Math X program, when moved from the 500 building to room 607, has been reduced due to the classroom space. As we transform the Math X program into an Emporium model, we would really like to expand offerings of the courses offered in Math X, however our current facility will not allow us to do so. Ideally, we would need the space to offer simultaneous multiple sections of courses in the Emporium mode, as well as small study rooms for just-in-time workshops to support the students.

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 could potentially benefit the entire campus, as many different disciplines can 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.

In terms of technology, our department would love to have classroom-monitoring software for labs, more wireless hubs and hotspots, smart boards and/or wireless projectors, and investigation into e-manipulatives.

Our calculator rental program has expanded, and we are running out of calculators to rent very early in the semester. More of our courses are requiring these graphing calculators.

E. What are your most important plans (either new or continuing) for next year?

We are working on offering non-credit co-requisite support courses, Math Jam courses, and non-credit certificates for enhanced non-credit.

Math 50: Core Intermediate Algebra will need a curriculum change for lecture and lab hours.

Math X is being converted to an Emporium mode.

We are working with the Assessment office to implement Multiple Measures into our assessment process based on the recommendations by the RP Group.

With the state CAI, we are conducting conceptual mapping of departmental courses to state core competencies.

The Math Club is expanding its offerings to students by offering an open-panel discussion with Lawrence Livermore National Labs and hosting a guest lecturer for the public, and plans to offer more organized help for the AMATYC Student Math League.

We will be working with A&R to offer math courses in a Fast Track mode (two math courses within one semester), by Fall 2018.

Math Jam for science classes is being considered in collaboration with other departments (Sciences).

We would like to sit down with our Biology, Physics, Engineering, Chemistry, and Computer Science colleagues and discuss if our math classes are meeting their students' preparation needs. Since we've had to open up the Engineering Tech cohort to STEM majors, this may be the place where we can incorporate in-context activities appropriate for the other sciences.

The Open Math Lab of the Integrated Learning Center has two main purposes: to support student learning through the TBA hour associated with select math courses and enhance instruction, and to give students opportunities to get "just-in-time" drop-in help with any math assignment or course. Because of this dual role, the Open Math Lab is an academic service as well as a student service. By collecting data that separates drop-in help from TBA, we can determine the proportion of the OML that is academic versus student service. Also, we can more easily track students who come in for drop-in help to see how successful they are in their courses.

F. Instructional Programs: 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.

Not applicable.

G. Do plans listed under Question E or Question F connect to this year's planning priorities (listed below)? If so, explain how they connect.

> *Planning Priorities for 2016-17*
> - *Establish regular and ongoing processes to implement best practices to meet ACCJC standards*

- *Provide necessary institutional support for curriculum development and maintenance*
- *Develop processes to facilitate ongoing meaningful assessment of SLOs and integrate assessment of SLOs into college processes*
- *Expand tutoring services to meet demand and support student success in Basic Skills, CTE and Transfer courses.*

1. Capturing the different needs from the ILC corresponds to ACCJC standards,
2. Math Jam, Fast Track, Non-credit co-requisite courses all need curriculum.
3. –
4. Integrating the OML, RAW, Tutorial centers into one facility would support student success and help expand tutoring services because we wouldn't be duplicating services.

H. Instructional programs: Did your program meet its program-set standard for successful course completion? __x__yes _____no

(This data can be found here: http://goo.gl/Ssfik2**)**

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

Yes, we did meet the program-set standard.

I. Units with SAOs: Using SAO data from last year, describe the impacts of SAO practices on student learning, achievement, or institutional effectiveness. Describe the practices which led to the success. (Copy the box below if you would like to discuss multiple examples). SAO data can be found here: http://goo.gl/jU2ylZ

SAO:
Describe the quantitative or qualitative results:
Discuss any actions taken so far (and results, if known):
Discuss your action plan for the future:

Part Two: Course-Level SLO Assessment Schedule

THIS SECTION HAS BEEN REMOVED. PLEASE SKIP TO PART THREE.

Part Three: Assessment Results

(Instructional Programs Only)

1. Describe an example of how your program used **course SLO data (SLOs)** from last year (2015-16) to impact student learning or achievement. (Copy the box below if you would like to discuss multiple examples).

Course: Math 65
Course SLO: Construct a linear model based on a given situation.
Describe the quantitative or qualitative results: 31% complete understanding; 19% partial understanding; 31% little to no understanding; 19% no attempt
Last year, approximately 25% on average scored the highest rating (Complete understanding) of the SLO related to Modeling. This shows a 6 percentage point increase in complete understanding.
Discuss any actions taken so far (and results, if known): More resources were posted on the math department Blackboard site.
Discuss your action plan for the future: We continue to look at how to improve the results of this SLO. We would like to have course-specific meetings with current teaching faculty regarding the teaching of the SLOs.

2. Degree/Certificate granting programs only: Describe an example of how your program used **program-level SLO data (PSLOs)** from last year (2015-16) to impact student learning or achievement. (Copy the box below if you would like to discuss multiple examples).

Degree/Certificate: Mathematics AS-T
Program SLO: Students will read, write, listen to, and speak mathematics with understanding.
Describe the quantitative or qualitative results: **Fall 2015:** A: 74 (42%); B: 39 (22%); C: 53 (30%); D: 0 (0%); E: 9 (5%)
Discuss any actions taken so far (and results, if known): As this is the first time we have data on our program SLOs, we have yet to take action.
Discuss your action plan for the future: Professional development for faculty around reading apprenticeship, which will help in teaching communication, is scheduled for the fall 2016 Flex Day.

Part Four: Program Curriculum Map
(Instructional Programs with Degrees/Certificates Only)

Background: Program-level Student Learning Outcomes

Program-level Student Learning Outcomes (PSLOs) are defined as the knowledge, skills, abilities, or attitudes that students have at the completion of a degree or certificate. Faculty within a discipline should meet to discuss the expected learning outcomes for students who complete a particular series of courses, such as those required for a certificate or a degree. PSLOs should be the big things you want students to get out of a degree or certificate. PSLOs should be developed throughout the program and in multiple courses. Discussions might also involve colleagues in other programs regarding prerequisites and transfer courses or community stakeholders regarding job expectations.

It is recommended that each program have 3-6 PSLOs. Discipline faculty members might need to have a more comprehensive list based on the requirements of external stakeholders (employers, state requirements, etc.). For most programs, PSLOs are only assessed through linked course-level SLOs. You might assess PSLOs in a capstone project or capstone course that many students complete when earning a certificate or degree. Alternatively, you could assess development of a set of skills as students advance through different courses in your program (ENG 1A -> ENG 4 or 7).

Program-level outcomes should

1. **describe** what students are able to do after completing a degree or certificate;

2. be **limited** in number (3-6 outcomes);

3. be **clear** so that students and colleagues can understand them;

4. be **observable** skills (career-specific or transferable), knowledge, attitudes, and/or values;

5. be **relevant** to meet the needs of students, employers, and transfer institutions;

6. be **rigorous** yet realistic outcomes achievable by students

Curriculum Map Directions

Note: If you have multiple degrees/certificates, choose one to map. If you have already submitted mapping to the SLO committee and do not wish to make changes, you may copy that mapping into this chart or attach the map you already created.

1. In the boxes across the top row, review all the non-GE courses required for your degree/certificate. (including those that aren't in your discipline). Make any desired changes to those courses. (Electives do not need to be included, though they may).
2. In the left column, write the program learning outcomes you have drafted for your program.
3. In the boxes in the center of the page, mark the course SLO that maps to the program SLO you have identified. Each program SLO should map to multiple courses in your program.

Example: English Associate's Degree for Transfer						
Program Learning Outcomes	**Required Courses in Degree/Certificate**					
	Eng 4	Eng 7	Eng 35	Eng 41	Electives* (Eng 20, 32, 45, 44)	MSCM 1*
1. Identify and evaluate implied arguments in college-level literary texts.	x					
2. Write an academic essay synthesizing multiple texts and using logic to support a thesis.	x	x				
3. Write a research paper using credible sources and correct documentation.	x	x				x
4. Analyze an author's use of literary techniques to develop a theme.			x	x	x	

*Including electives is optional.

Your Program's Map

Degree or Certificate: Mathematics AS-T																
Program Learning Outcomes (3-6 recommended)	**Required Courses in Degree/Certificate**															
	Math 1	Math 2	Math 3	Math 7	Electives* CS1, Math 5, Phys 8A, Math 40											
1. Students will demonstrate the ability to use symbolic, graphical, numerical, and written representations of mathematical ideas.	X	X	X		X											
2. Students will learn mathematics through modeling real-world situations.	X	X	X	X	X											
3. Students will read, write, listen to, and speak mathematics with understanding.	X	X	X	X	X											
4. Students will use appropriate technology to enhance their mathematical thinking and understanding, solve mathematical problems, and judge the reasonableness of their results.	X	X		X	X											
5. Students will use mathematical reasoning to solve problems and a generalized problem solving process to work word problems.	X	X	X	X	X											
6.																

1. Did you make any changes to your existing mapping? (circle one)

    Yes   No   ⬭This degree/certificate did not have previous mapping⬭

2. If you answered "yes" to Question 1, explain what changes you made.

3. Reflection Questions: The following questions are for the consideration of your program as you look at your completed chart. You do not need to record your responses here. If you discuss these questions with others (for example, at a department meeting), you may want to take minutes documenting your discussion.

a. How many courses help students achieve each program outcome? Do students have enough opportunities to achieve the outcome?
b. In which course(s) are students likely to demonstrate satisfactory achievement of each program outcome? In other words, which courses(s) might be an official or unofficial capstone requirement?