Program Review Report

Yuba Community College District

YC - Mathematics & Statistics Program Recommendations

Year of Review: 2013-2014
Type of Review: Annual Update
Executive Summary (Include a list of team members): Department of Mathematics and Statistics faculty members:
Kathryn Boyes, Roger Davidson, Sarah Kovacs, Christopher Noffsinger, Michael Papin, Karsten Stemmann, John Steverson, John Thoo, Kirk Wardlaw

EXECUTIVE SUMMARY
The Department faculty members are doing well, but the Department is in dire need of additional full-time instructors to cover all the sections that are to be offered at Marysville and the Sutter County Center.

A1. Do students have access to curriculum-specific and/or program-specific support services? If so, describe this service(s). If not, explain why.

(i) The Department maintains and staffs the Hard Math Cafe in room M-700 and the Hard Math Cafe Annex in room M-702 that provides for drop-in help for mathematics students.

<http://ms.yccd.edu/hard-math-cafe.aspx>

The Hard Math Cafe (M-700) adjoins the MESA Center (M-701) and is the original Hard Math Cafe. Currently, most of the drop-in help occurs in the HMC Annex (M-702), where instructors hold some or all of their office hours to staff the Annex. Student tutors have also been hired using Basic Skills Initiative (BSI) funds to fill in the gaps in staffing the Annex.

In December 2012, the Department dedicated the Hard Math Cafe to Lauren E. Syda, long-time Department Chairwoman, upon the occasion of her retirement.

Sarah Kovacs is the lead instructor for the Hard Math Cafe and HMC Annex, and puts together the staffing schedule for the fall and spring semesters. Kovacs is currently piloting a new student tracking system for the Annex that is called "tutortrac" that is produced by Redrock Software Corporation. The program will help track student use of the HMC Annex. Eventually, the program will also track tutor presence as well. The program is web-based and should be used for tracking student use all tutoring centers in the College by Spring 2014; for example, the College Success Center is also using tutortrac currently.

(ii) At the Clear Lake Campus two student tutors were hired for the Spring 2013 semester and also for the Fall 2013 semester. Each student worked out of the Library for 8 hours a week on a drop-in basis. Students who came for tutoring signed in and out on a Sign-in sheet, and each month the total student hours were calculated and compared with total tutor hours. For each month there has been more than one student-hour for each tutor-hour; and sometimes it has been more than two student-hours per tutor-hour. During the Spring semester tutors were paid with a combination of BSI funds and Federal Work Study (FWS) funds. During the Fall semester both tutors are being paid only with FWS funds.

(iii) Affiliated to the Department is the Yuba College Mathematics, Engineering, Science Achievement (MESA) Program.

<http://ms.yccd.edu/mesa.aspx>

MESA has been at Yuba College for over a decade, and many students have benefited by the support that MESA provided them. The Department supports MESA both directly (for example, by holding Academic Excellence Workshops and reporting students' progress to the Director) and indirectly (for example, by encouraging students to enter MESA). MESA students have transferred to four-year colleges and universities to major in a STEM (Science, Technology, Engineering, and Mathematics) discipline. There is a huge push at all levels of the State and CCC to encourage students to enter a STEM field, and MESA supports this directly. MESA students have also won numerous National Science Foundation and other prestigious scholarships, as well as have attended many leadership workshops and camps. Recently, however, MESA has suffered from a drastic reduction in support by the College and the District. An apparent consequence of this is that MESA lost its State funding last year and has been operating on a shoestring budget. The Director is now part time, and the direction and the fate of MESA is unclear. Students in MESA populate the transfer-level mathematics courses (Math 1A, 1B, 1C, 2, and 3) and, thus, help us to continue to offer the courses.

(iv) The Department organizes activities to increase student interest in mathematics. Four activities in particular are

o AMATYC Student Mathematics League

<http://www.amatyc.org/?StudentMathLeague>

The American Mathematical Association of Two-Year Colleges (AMATYC) sponsors the Student Mathematics League (SML), a national mathematics contest for two-year college students. YC has administered the SML to our students for over two decades. Until his retirement in 2003, Kenneth Gaal ran the SML at YC. Since then, Kirk Wardlaw has been running the SML at YC. The contest occurs twice a year and an average of 50 students participate each time.

o Math Poetry Contest.

<http://ms.yccd.edu/downloads.aspx#mathpoetry>

A District-wide contest for students every spring semester, the Math Poetry Contest seeks to broaden interest in mathematics through the writing of poetry. The contest is judged by English Department instructors.

o Mathematics Film Festival.

Held during the month of April to coincide with Mathematics Awareness Month, the Mathematics Film Festival. Each week during April a movie or documentary that revolve about mathematics is shown. Students and all College personnel are invited to come to watch.

o Math Day.

Sarah Kovacs organized the 2013 Math Day events that occurred on April 29. This was an all-day celebration that was held in room M-702. The activities included a mathematics puzzle contest, a mathematics art contest, a Sudoku contest, mathematical games, mathematical art activities, and a raffle. Attendees were also given free pizza, buttons, stickers, posters, and other mathematics positive items.

o History of Mathematics Writing Contest.

A District-wide contest for students every fall semester, the History of Mathematics Writing Contest seeks to broaden interest in mathematics through the writing of mathematics history. The contest is judged by English Department and History Department

instructors.

<http://ms.yccd.edu/downloads.aspx#hom>

A2. If services are available, how do they demonstrate an increase in student success?

The Department has not measured the effectiveness of the drop-in help provided at the Hard Math Cafe and HMC Annex.

NOTE: The "Program/Unit Recommendation" tab and the "Status" tab in TracDat were not updated. Program recommendations appear in the "Future Goals and Program Direction" box below.

Program Description : B3. How is current and previous program review data used to refine and improve program or department practices?

Each year the Department reviews what it has attempted and what it has accomplished, then sets goals for the next year based on that.

Industry Trends and Program Analysis
(For addition resources: http://yc.yccd.edu/about/research-planning-links.aspx)

C4. How do program or department goals align with the education, diversity, demographic, and workforce needs of local communities?

The Department has student success at the center of its goals. Almost every student that comes to Yuba College eventually needs to take a mathematics course. The Department strives to offer classes to support the various degrees, programs, and certificates on campus. As some of the students plan to transfer to a 4-year college or university we offer a variety of courses, some for liberal arts, liberal studies, as well as calculus and above, for the student to take before transferring. For those students who do not plan to attend a 4-year college or university immediately or at all, the Department plans to offer Math 58 as an alternative to Math 52 in Spring 2014.

C5. How is your program or department direction driven by empirical data?

In 2007--2008 Math 50A Elementary Algebra First Half and Math 50B Elementary Algebra Second Half were introduced as an alternate, slower-paced path through the material covered to meet the learning objectives of Math 50 [see 2007 Program Review]. In 2009--2010 Math 52A Intermediate Algebra First Half and Math 52B Second Half were introduced as an alternate, slower-paced path through the material covered to meet the learning objectives of Math 52 [see 2010 Program Review Update]. We began each by offering only one section per semester of these AB courses. We later offered two sections in a semester, but recently we have returned to offering only one section in a semester because of meager funding. Because of the limited number of sections that were offered, there was not enough data generated to measure the effectiveness of these AB courses. This year, we felt that we have finally had many enough students who have taken the AB courses to attempt to measure the effectiveness of the courses. We decided to begin with Math 52A and 52B. As such, we have requested the following data from the Office of the Vice-President. Specifically, we have asked:

"Of the students who successfully completed both Math 52A and 52B and who enrolled in a subsequent mathematics or statistics course (that has Math 52 as a prerequisite), what percent successfully completed the subsequent course on the first try; and of the students who successfully completed Math 52 and who enrolled in a subsequent mathematics or statistics course (that has Math 52 as a prerequisite), what percent successfully completed the subsequent course on the first try?"

We are awaiting the data. Depending upon the outcome of our analysis, we will decide whether to continue with the AB courses or to abandon them.

Curriculum & SLO Assessment Summary : D6. What has your program or department done to improve completion of degrees, certificates, or transfers? What are your future plans?

(i) The Department created an Associate's in Science -- Transfer (AS-T) degree in 2012--2013 that has been approved by the State. Subsequently, the Department has updated the course descriptions for the following courses to align them with the C-ID descriptors.

Math 1A, 1B, 1C (formerly 2A), 2 (formerly 2B), 3, 7, 9, 15, 21, and 25, and also Stat 1. These courses either support the Mathematics AS-T or support an AD-T in other disciplines (for example, business and psychology).

The Department also created a new course, Math 20 College Algebra, that is listed as a prerequisite in the C-ID course descriptor for Math 1A. Math 20 was offered for the first time at the Marysville campus in Spring 2013.

All of these courses either have received C-ID approval or are currently in the approval process.

Note that because of the change in course numbers, Math 2A to 1C and Math 2B to 2, the Department must now update the AS-T requirements to reflect the changes i in the course numbers. The process has begun in CurricUNET.

(ii) As a result of the change in the Associate's Degree Mathematics Competency requirement in 2006 from Math 50 to a mathematics or statistics course that has Math 50 as a prerequisite, the Department was asked to develop an alternative to Math 52 for those students who were not intending to transfer to a 4-year college or university immediately or at all. The already had Math 51 Geometry in place that would satisfy the new Mathematics Competency requirement; yet the Department responded by developing another course, Math 58 Quantitative Analysis [2007 Program Review]. Math 58 was then offered in Spring 2008 and Spring 2009, but it was canceled each time because of no enrollment. It was believed that students were not interested in Math 58 at that time because many were still able to graduate using Math 50 to meet the Mathematics Competency requirement (they were grandfathered); however, it is now believed that those students have dwindled. Therefore, the Department will offer Math 58 once more in Spring 2014 to see if there is any student interest. The Department will decide after that if we will continue to offer Math 58 or if we will deactivate the course.

(iii) The Department received a request from the Computer Science Department for a new course, Discrete Mathematics, to support their AD-T. The Department is now creating such a new course, Math 17 Discrete Mathematics, in CurricUNET.

(iv) The Vice-President encouraged the Department chairman to consider using Supplemental Instruction (SI) to increase success in mathematics courses. There was a Flex workshop on SI during this year's Fall Convocation week that featured personnel from Butte College who have implemented SI with great success by their measurements. SI involves the hiring of a student tutor who would work closely with a mathematics instructor for a particular course. Therefore, a funding source would need to be identified to implement SI. If a funding source is identified, then the Department may consider implementing SI. Any plan to implement SI must be accompanied by a plan to evaluate the effectiveness of the program in improving success.

(v) The Vice-President informed the Department chairman that State law has been amended to allow community college to require students to begin their remedial English and mathematics courses in their first year. If this is determined to be correct, then the Department may consider approaching the Academic Senate with a proposal to require all students to begin their remedial mathematics courses in their first year. Such a move would almost surely require that additional full-time instructors be hired to staff additional sections of mathematics.

(vi) The Department has staffed sections of Math 110, 111, 50, and 52, and Stat 1 at the Sutter County Center (SCC) with full-time and adjunct instructors since its opening in Fall 2012. In Summer 2013 the Department offered Math 20 College Algebra at SCC for

the first time, and again in Fall 2013. The Department will offer Math 21 Trigonometry at SCC in Spring 2014 for the first time. The Executive Dean of SCC has been wanting the Department to offer transfer mathematics courses in addition to Stat 1, and Math 20 and 21 are our first. Math 20 and 21 will lead up to our offering Math 1A Calculus I at SCC in Fall 2014. We note, however, that the Department's full-time instructors are currently stretched very thinly between Marysville and SCC, so it will have to be seen how we may staff increasingly many transfer mathematics courses at SCC.

(vii) The Department will pilot a "Mathematics Boot Camp" Program in Summer 2014. The Boot Camp will be designed to review topics in basic mathematics that would help students to score higher on the Mathematics Placement Test, as well as to increase their potential for success in their future mathematics courses.

D7. Do you have any courses, certificates, or degrees that should be in-activated or expanded? If yes, please identify and justify your recommendations with data.

(i) The Department will soon be discussing what to do about Math 7 Precalculus, which in the distant past had strong enrollment, but in recent years has had very low enrollment. In recent years until now Math 7 has not been a requirement for any course; Math 7 was only recommended for students who were planning to take Math 1A Calculus I. Now, however, to be aligned with the C-ID descriptor, the prerequisite for Math 1A is either both Math 20 and Math 21 or Math 7. Note that the prerequisite for Math 7 is Math 21, so Math 7 does not provide a shorter path to Math 1A. Enrollment in Math 21 continues to be strong, and enrollment in Math 20, that has been offered since Summer 2013, is also strong. Therefore, the Department needs to decide if the is any reason to continue offering Math 7.

(ii) The Department may consider increasing the number of units for Math 50 and 52 from 4 units to 5 units. This was first mentioned in the 2007 Program Review, but the Department has not considered it seriously since. Increasing the number of units for Math 50 and 52 would not only increase the contact hours with students, and thereby perhaps increase the overall success rate, but it would also bring Yuba College in line with many other California community colleges. Any plan to increase the number of units for Math 50 and 52 must be accompanied by a plan to evaluate the effectiveness of the change in improving success.

(iii) The Department discussed in the past offering a History of Mathematics course that would satisfy the Associate's Degree Mathematics Competency requirement; the prerequisite would be Math 50. Such a course also ought to satisfy the Multicultural Graduation requirement. This was tabled because of the cuts in the number of course sections to help address the District's and College's financial hardships. If the Department is allowed to offer more course sections again, then we may resume this discussion.

D8. Do all of your courses have current CORs? If not, what steps are you taking to ensure compliance?

Yes.

D9. If applicable, how are teaching methodologies in your program or department assessed?

NA.

D10. If applicable, how are the results of the assessment used to support, improve, and/or expand your current teaching methodologies

NA.

D11. If your program or department uses a DE modality to support instruction, how are you evaluating the effectiveness of that instruction?

The Department offers Math 50 Elementary Algebra and Math 52 Intermediate Algebra as online courses, and also as ITV courses. The Department also offers Math 7, Math 20, and Math 21 as ITV courses. The Department has not measured the effectiveness of the instruction for these courses that are offered using a DE modality.

D12. If your department offers DE courses, what support services does it provide for DE students? What can be done to improve support services for these students?

The Department does not provide extraordinary services for DE students. DE students are able to contact their instructors for help via email or other online means, or via telephone. Otherwise, DE students must come onto one of the campuses for organized or drop-in tutoring help. The English Department, through the Writing and Language Development Center (WLDC), is now investigating providing online tutoring help to DE students. The Mathematics Department may consider doing the same after the WLDC has assessed its efforts.

D13. How is your program or department applying sound principles of learning and teaching theory to its curriculum?

The Department faculty members keep up-to-date with pedagogical practices through attendance at conferences and workshops and courses, and through memberships in professional organizations. New ideas are brought back to the classroom to the extent that is possible using the resources that are provided by the College. Unfortunately, this often means that many ideas cannot be piloted or implemented because of a lack of resources.

D14. Which CSLOs (course student learning outcomes) and PLOs (Program learning outcomes) were assessed within the last year?

The Department has developed CSLOs for every mathematics course that is offered, and has assessed every course at least once. The Department intends to assess CSLOs in every course that is offered every semester and summer session. The Department in Fall 2013 fleshed out our PSLOs to be:

1. Perform operations on mathematical objects (e.g. numbers, expressions, functions, matrices).
2. Solve equations and inequalities.
3. Graph equations, functions, inequalities.
4. Solve applied problems using mathematical or statistical methods.
5. Prove identities and theorems.
6. Apply definitions, notation and properties of mathematical concepts.

D15. For each of the above, how did the assessment data influence program, department and/or course improvement?

The Department determined that the CSLOs are deficient and do not provide enough information about the outcomes of a course. Therefore, the Department is currently in the process of revising the CSLOs for each course, beginning with Math 52 Intermediate Algebra, that would align with the PSLOs. Following this, new assessment methods will be devised and tested.

Industry Trends and Program D6. What has your program or department done to improve completion of degrees, certificates, or transfers? What are your future

Data Analysis : plans?

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Goal Type

Yuba College Goal

E16. How do program or department goals align with stated Yuba College goals?

The Department goals align to the stated Yuba College goals in the following ways:

1. "Foster a culture of evidence-informed decision making, including SLO development/assessment and other measures of student success"

This year the Department is working to improve our CSLOs and assessment methods so that the data can be better used to make decisions.

2. "Prioritize and allocate resources based on existing and emerging community and student needs over those of individual projects or programs"

The Department continues to offer more classes at SCC to meet the students' needs.

5. "Design our programs in such as way as to allow students to complete their educational goals in a timely manner."

The Department is offering more courses at SCC. Also, the Department will be offering Math 58 as an alternative option to Math 52 for students who do not plan to transfer to a 4-year college or university immediately or at all.

6. "Evaluate our programs, services and processes to ensure continuous quality improvement"

The Department is meeting monthly this year to improve the CSLOs and assessment. This provides the Department an opportunity to discuss improvement.

7. "Improve the quality of the student experience at all our campuses and centers"

The Department maintains and staffs the Hard Math Cafe in room M-700 and the Hard Math Cafe Annex in room M-702 that provides for drop-in help for mathematics students.

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The Hard Math Cafe (M-700) adjoins the MESA Center (M-701) and is the original Hard Math Cafe. Currently, most of the drop-in help occurs in the HMC Annex (M-702), where instructors hold some or all of their office hours to staff the Annex. Student tutors have also been hired using BSI funds to fill in the gaps in staffing the Annex.

Student tutoring help is also available at Marysville and at SCC through the College Success Center. At the Clear Lake Campus two student tutors were hired for the Spring 2013 semester and also for the Fall 2013 semester.

YCCD Board of Trustees Vision

E17. How does the program support the YCCD District Vision Statement? Specifically, how does the program meets the needs of our students and communities?

"Providing an innovative, world-class learning environment"

The Department faculty members keep up-to-date with the mathematical discipline and with pedagogical practices through attendance at conferences and workshops and courses, and through memberships in professional organizations. New ideas are brought back to the classroom to the extent that is possible using the resources that are provided by the College. Unfortunately, this often means that many ideas cannot be piloted or implemented because of a lack of resources.

Equipment/Technology

Technology

F18. To what degree does your program or department have adequate and appropriate technology to support effective instruction (e.g., software, computers, and information technology)?

(i) Minitab for Stat 1 was updated to version 16 at all sites; however, the update was not installed on statistics instructors' computers.

(ii) Aside from using Minitab in Stat 1, the Department does not currently incorporate the use of technology such as graphing calculators or personal computer software (such as Mathematica or Matlab, or their open source counterparts such as Maxima or Octave) in the mathematics curriculum. The Department has resisted doing so mainly because of the perceived negative impact that such a requirement would have upon our students, for we are situated in a lower economic community. Many community colleges and, perhaps more importantly, many 4-year colleges and universities to which our students may transfer do expect their students to learn and use such technology. Therefore, we may investigate the feasibility of incorporating the use of technology in parts of the mathematics curriculum. Incorporating the use of technology may require additional funding to purchase the appropriate software, and so on, and to have on deck the necessary support staff.

(iii) Many instructors are using MyMathLab, a web-based homework and testing management system, for Math 50 and 52, and some instructors are using WebAsign in some other courses. Increasingly many textbooks may be purchased bundled with access to such web-based enhancements. There has not been an analysis to determine the effectiveness of these web-based enhancements in improving success.

Equipment

F19. To what degree does your program or department have adequate and appropriate equipment (other equipment, not computers or IT related).

None of the older classrooms at the Clear Lake Campus are equipped with a document camera (e.g., Elmo). A document camera in the main mathematics classroom (room C-603) would be helpful for illustrating graphing techniques on graph paper. A document camera would also be useful for demonstrating how to solve problems while facing the class and for sharing work done by students or the instructor without having to copy it out on the whiteboard.

Facilities

G20. To what degree does your program or department have adequate facilities to support effective instruction? Please explain.

The Mathematics Program does not have adequate facilities.

(i) The College employs a sizable number of mathematics adjunct instructors, and there is a need for mathematics adjunct faculty members to work and to meet with students. Many of the mathematics courses offered are taught by adjunct faculty members, and so many students are served by adjunct faculty members. Most of our adjunct faculty members travel here from outside the Yuba-Sutter area, and it would be very helpful for them to have a place to meet students privately, as well as a place to work in between classes and to leave their belongings in between classes.

(ii) There is an acute need for modern classrooms. Presently many mathematics classes are taught in temporary classrooms (the "swing space": M-3003 and M-3004) because there are not enough available permanent classrooms for mathematics. Mathematics classes are also taught in classrooms (M-607 and M-713) that do not allow the classes to enroll to cap. Many mathematics courses are now taught in classrooms that do not include at least better (larger) student desks that would provide students with a greater working area, as well as provide instructors the flexibility to present lectures, conduct small group activities, &c.; wide writing spaces for instruction (several blackboards or whiteboards, or both); flexible projection systems; and Internet access.

N.B. The temporary classrooms will be removed by Spring 2014 and will no longer be available. Space now needs to be found for the mathematics classes that were scheduled to be held there in Spring 2014.

The minimal solution would be for the College to upgrade existing classrooms or make available existing classrooms or construct new classrooms that would be suitable for our teaching mathematics today. The optimal solution would be to construct a new building that would house the Mathematics, Engineering and Drafting, and Computer Science programs. The building should be two stories, with classrooms and engineering laboratory on the first floor; and computer laboratory, MESA, the Hard Math Cafe, student and staff lounges, a meeting or conference room, and faculty offices on the second floor. See Brian Birgen's article, "How to design a mathematics building," _Focus_, May/June 2005; URL below.

<http://www.maa.org/sites/default/files/pdf/pubs/june%2005web.pdf>

There is a huge push at all levels of the State and CCC to encourage students to enter a STEM (Science, Technology, Engineering, and Mathematics) field. A new building for the Mathematics, Engineering and Drafting, and Computer Science programs would go a very long way towards making Yuba College a Premier College for STEM in the North State.

Faculty

H21. Does this program or department have adequate full-time faculty to support a high quality program? Please explain.

No.

(i) It is recommended that YC hire at least two (2) additional full-time mathematics instructors at Marysville.

In 2013 YC hired one new full-time mathematics instructor, Christopher Noffsinger, who started his full-time employment in Fall 2013. With Noffsinger, the Department now has 7.5 full-time FTEF assigned to Marysville and 1 full-time FTEF assigned to CLC. The full-time instructors at Marysville are having to cover some sections of mathematics and all the sections statistics at SCC; and this strain will only increase if SCC offers more transfer mathematics courses as it intends. Additionally, in the short term, of the 7.5 full-time FTEF assigned to Marysville, one currently has 40% release time to be the Director of the College Success Center, and one has 20% release time to be the Flex Coordinator.

We note that (i) as of October 18, 2013, there are 17 unstaffed sections of Math 52 and below for Spring 2014; (ii) we do not anticipate being able to staff these sections with adjunct instructors; (iii) we do anticipate this to be an ongoing problem because it has become increasingly difficult to find suitable adjunct instructors to increase our adjunct pool.

To meet all of this demand that we anticipate will continue into the foreseeable future, therefore, YC must hire at least two (2) additional full-time mathematics instructors.

From the data provided by the Office of Research, Planning, and Student Success, we find that the 2011--2012 Adjunct FTEF/Full-time FTEF ratio was the highest between 2007 and 2012; unfortunately, data for 2012--2013 is not available.

Adjunct FTEF/Full-time FTEF ratio
2012--2013: ?
2011--2012: 1.82
2010--2011: 1.10
2009--2010: 0.98
2008--2009: 1.13
2007--2008: 1.37

In 2011--2012 the full-time FTEF was 6.91, and in the 2012 PRU we reported that the College hired one full-time mathematics faculty member, Kathryn Vaughan (now Kathryn Boyes; replaced Catherine Heaton, who retired at the end of Spring 2011), who began in Fall 2012. At that time, we noted that, "There remains a very great need to hire at least one (1) full-time math faculty member for Yuba College, particularly one who meets minimum qualifications to teach statistics" [2012 PRU, page 3 of 22]. Since then, the College has hired another full-time faculty member, Christopher Noffsinger (replaced Lauren Syda, who retired at the end of Fall 2012), who began in Fall 2013 and who meets the minimum qualifications to teach statistics; so it appears that the Department's full-time staffing needs have been met presently. However, the 2012 PRU did not account for SCC, and with the opening of SCC there is now a need again for the College to hire at least two (2) full-time mathematics faculty members, preferably with at least one who meets the minimum qualifications to teach statistics.

Data from the Office of Research, Planning and Student Services. (Data from 2012--2013 is not available.)

YEAR*	FTEF**	FTES**	WSCH**	WSCH/FTEF**
2012--2013	?	?	?	?
2011--2012	19.47	652.47	19,574.10	503
2010--2011	17.51	666.30	19,989.00	571
2009--2010	18.45	637.45	19,123.50	518
2008--2009	19.15	710.69	21,320.70	557
2007--2008	18.56	655.94	19,678.20	530
Five Year Average	18.63	664.57	19,937.10	535

*Data from 2007-8 include all Distance Education sections.
**Program data; not restricted to Marysville.

The requested position would help with staffing at SCC, particularly because SCC seeks to expand offering transfer-level mathematics and statistics courses, and to staff an expanded offering of transfer-level mathematics courses at Marysville (the addition of Math 20 and the request by the Computer Science Department for the creation of a new course, Math 17 Discrete Mathematics).

We note that in the short term we shall continue to suffer the temporary reassignment of Karsten Stemmann (20%; Flex Coordinator) and Roger Davidson (40%; College Success Center Director); moreover, Davidson plans to go on sabbatical in 2014--2015.

The Department routinely offers many sections of mathematics courses needed for degree and transfer requirements. Many of the courses are designed for biology, engineering, physics, elementary education and other disciplines. The WSCH/FTEF ratio is very large given the wide array of demands put on the department. Almost all students at Yuba College take at least one mathematics course.

Nearly half of the mathematics students are taught by adjunct instructors. In Fall 2012 we had to cancel one section of Math 111 because it could not be staffed; in Spring 2013 we had to cancel one section of Math 50 and one section of Math 52 because they could not be staffed; and in Fall 2013 we had to cancel one section of Math 110 because it could not be staffed. This is a recent phenomenon for the Department, and one that we hope will not continue. However, we note that for Spring 2014, as of October 18, 2013, we still had 17 sections of Math 52 and below at both Marysville and SCC that are unstaffed and we have exhausted our adjunct pool: 12 at Marysville and 5 at SCC. (We have not received any new applications for adjunct employment and very likely will not receive any soon.) Furthermore, all transfer-level courses, collectively referred to as "singletons" because they are usually single-section courses, are staffed by full-time faculty members, and we typically do not cancel singletons; therefore, any courses that would be canceled because they are not staffed would almost totally consist of the developmental and remedial mathematics courses (Math 52 and below). These sections are always wait listed, and cancelation of these sections would surely delay the progress of students toward their educational goals.

Finally, we note that

o Roger Davidson plans to go on sabbatical in 2014--2015, and that he intends to retire in 2019.

o John Thoo plans to go on sabbatical in 2016--2017.

(ii) It is recommended that YC hire at least one (1) additional full-time mathematics instructor at CLC.

This recommendation was made in the 2012 PRU. At that time---and it still holds true now---we noted that there is only one full-time mathematics faculty member at the Clear Lake Campus. Due to its location it is very difficult to find adjunct math faculty who meet the minimum qualifications for mathematics in the Clear Lake area. This is the reason the adjunct FTEF (EP/NC/etc.) numbers are so low at CLC, and in fact most of that (EP/NC/etc.) is due to EP. Because of this the campus can only offer one section at most of the developmental courses and one section of a transfer level course (usually Stat 1). As a result, it is challenging for students to access the mathematics and statistics courses they need in order to make progress in a timely fashion, either because a course is full, or the only time it is offered conflicts with another course they need. When there is only one section offered for the developmental math classes, they fill up and are waitlisted. When a second section has been added, there are plenty of students for each section. The best solution is to hire another full-time mathematics faculty member at the Clear Lake Campus so that course offerings can be expanded and students will have the options they need to make progress toward their goals.

(iii) There is a need to provide 20% release time to one full-time faculty member to assume the responsibilities of a Department Principal (chairman or chairwoman or coordinator).

There is a need for one person to have an overall awareness of the issues that impact the Department from both within and without the College and District.

As we noted in the 2012 PRU, there has been a large increase in the number of mathematics adjunct faculty members that requires an increase in the coordination of schedules, expectations, &c.

YC and WCC offer a common curriculum. There are district-wide common final exams in Math 111, 50, and 52. YC offers both AS and AS-T degrees in mathematics as well. There is a need to work with local high schools to smooth their students' transition into taking math courses at YC. There is a need to maintain communication with 4-year colleges and universities to which our students

transfer, notably with UC Davis, CSU Chico, CSU Sacramento, and U. of the Pacific, to ensure that our students are adequately prepared.

There are also many other things for which a Department Principal would be responsible that have not been written here. But these have been written that you may come to believe that there is indeed a need for a full-time faculty member to be provided at least 20% release time to assume the responsibilities of a Department Principal.

Staffing

I22. Does this program have adequate technical/clerical staff to support a high quality program?

Faculty and Staff Support and Professional Development

J23. In the last year, what professional development or networking has faculty and/or staff participated in?

Kathryn Boyes

o Attended Reading Apprenticeship Workshop at Yuba College (February 2013)
o Attended the Sacramento Valley Community College Mathematics Conference at Sacramento City College (March 2013)
o Attended the Supplemental Instruction Workshop at Yuba College (August 2013)

Roger Davidson (50% Mathematics)

o Attended the Summer Engineering Teaching Institute (SETI) at Canada College (May 2013)
o Presented at SETI on two technologies, MasteringEngineering and Piazza (May 2013)
o Participated in the MAA PREP Workshop "Big Data" at Williams College, MA (June 2013)

o Plans to go on sabbatical in 2014--2015 to obtain a graduate certificate in Mining Massive Data Sets from Stanford U. in order to inform possible new interdisciplinary curriculum between statistics and computer science.

Sarah Kovacs

o Attended the California Mathematics Council, Community Colleges 2012 Fall Conference at Monterey
o Will take a Reading Apprenticeship course online in Spring 2014 in order to implement RA strategies in either Math 52A or Math 52 to start.

o Plans to take an online course in Reading Apprenticeship in Spring 2014 to implement RA in either Math 52A or Math 52 to begin.

Michael Papin

o Attended the California Mathematics Council, Community Colleges 2012 Fall Conference at Monterey
o Attended the Sacramento Valley Community College Mathematics Conference at Sacramento City College (March 2013)

John Thoo

o Guest editor for the journal Problems, Resources, Issues in Mathematics Undergraduate Studies (PRIMUS) Special Issue on the Use of History of Mathematics to Enhance Undergraduate Mathematics Instruction (August 2012--present)
o Attended History and Pedagogy of Mathematics (HPM) Americas Section 2012 West Coast Meeting at UC Berkeley (October 2012)
o Attended the California Mathematics Council, Community Colleges 2012 Fall Conference at Monterey
o Attended the AMS-MAA Joint Mathematics Meetings at San Diego (January 2013)
o Attended the MAA Golden Section Section Meeting at University of the Pacific (February 2013)
o Attended the Sacramento Valley Community College Mathematics Conference at Sacramento City College (March 2013)
o Published an article, "Binary powering in ancient India," _MathAMATYC Educator_, Vol. 4, No. 3 (May 2013)
o Chairman of the MAA Golden Section Committee for Distinguished College or University Teacher of Mathematics (2012--2013)
o Member of the editorial board of PRIMUS (2012--2013)

J24. How did these activities contribute to student success? (include supportive data)

These activities have helped Department faculty members to keep up-to-date with the mathematical discipline and with pedagogical practices through attendance at conferences and workshops and courses, and through memberships in professional organizations. New ideas are brought back to the classroom to the extent that is possible using the resources that are provided by the College. Unfortunately, this often means that many ideas cannot be piloted or implemented because of a lack of resources.

J25. How does professional development in your program or department support basic skills students and foster inclusive classroom environments that value diversity?

There is a lack of organized professional development for mathematics instructors in the College. All the professional development have been undertaken at the personal initiative of the Department faculty members. Nevertheless, there is a culture within the Department that seeks to support all students, from the basic skills students to the transfer students, and to foster inclusive classroom environments that value diversity, i.e., a broad view and appreciation of mathematics.

J26. What Staff Development activities would you suggest be offered in the next year that would enhance your program?

Time and material support should be made available for mathematics faculty to meet regularly for the purpose of discussing and sharing mathematics and the teaching of mathematics. A monthly brown bag seminar, session, or lunch would be one way to accomplish this if the Department faculty members would be afforded the time and the material support for it.

<http://en.wikipedia.org/wiki/Brown_bag_seminar>

Future Goals and Program Direction:

NOTE: The "Program/Unit Recommendation" tab and the "Status" tab in TracDat were not updated. Program recommendations appear in the "Future Goals and Program Direction" box here.

Future Goals and Program Direction

K27. Based on Program Review, what are your plans for future department/program improvements?

HIGH PRIORITY

o Hire at least two (2) additional full-time mathematics instructors at Marysville.

o Continue to offer tutoring at CLC.

o Continue to support the MESA Program.

o Assess the effectiveness of Math 52A and 52B, and Math 50A and 50B.

o Pilot a "Mathematics Boot Camp."

o Decide upon the continuation of Math 7.

o Continue to develop better CSLOs and assessment methods for mathematics courses.

o Upgrade facilities for teaching mathematics and for mathematics instructors (particularly adjunct instructors) to meet with students. The minimal solution would be for the College to upgrade existing classrooms or make available existing classrooms or construct new classrooms that would be suitable for our teaching mathematics today, and to find suitable office space for mathematics adjunct instructors. The optimal solution would be to construct a new building that would house the Mathematics, Engineering and Drafting, and Computer Science programs.

MEDIUM PRIORITY

o Hire at least one (1) additional full-time mathematics instructor at CLC.

o Track the use of the Hard Math Cafe and HMC Annex.

o Continue to provide worthwhile extra-classroom experiences for students such as the AMATYC Student Mathematics League, the Math Poetry Contest, the Mathematics Film Festival, Math Day, and the History of Mathematics Writing Contest.

o Discuss the desirability of using Supplemental Instruction.

o Discuss increasing the number of units for Math 50 and 52 from 4 units to 5 units.

o Discuss assessing the effectiveness of teaching mathematics in the DE modality.

o Continue to pursue at least 20% release time for one full-time faculty member to assume the responsibilities of a Department Principal (chairman or chairwoman or coordinator).

o Department faculty members will continue to engage in professional development on an individual basis by attending conferences and workshops and courses, as well as engage in other professional activities.

LOW PRIORITY

o Discuss the desirability of having student "front load" their mathematics courses, i.e., to take them early in their time at YC, particularly basic skills students.

o Discuss the desirability of providing online tutoring help to DE students after the WLDC has successfully implemented online tutoring for English courses.

o Seek time and material support for a monthly brown bag seminar, session, or lunch for mathematics instructors for the purpose of discussing and sharing mathematics and the teaching of mathematics.

NOTE: Justification for the goals appear below here.

Executive Summary

A1. Do students have access to curriculum-specific and/or program-specific support services? If so, describe this service(s). If not, explain why.

(i) The Department maintains and staffs the Hard Math Cafe in room M-700 and the Hard Math Cafe Annex in room M-702 that provides for drop-in help for mathematics students.

<http://ms.yccd.edu/hard-math-cafe.aspx>

The Hard Math Cafe (M-700) adjoins the MESA Center (M-701) and is the original Hard Math Cafe. Currently, most of the drop-in help occurs in the HMC Annex (M-702), where instructors hold some or all of their office hours to staff the Annex. Student tutors have also been hired using Basic Skills Initiative (BSI) funds to fill in the gaps in staffing the Annex.

In December 2012, the Department dedicated the Hard Math Cafe to Lauren E. Syda, long-time Department Chairwoman, upon the occasion of her retirement.

Sarah Kovacs is the lead instructor for the Hard Math Cafe and HMC Annex, and puts together the staffing schedule for the fall and spring semesters. Kovacs is currently piloting a new student tracking system for the Annex that is called "tutortrac" that is produced by Redrock Software Corporation. The program will help track student use of the HMC Annex. Eventually, the program will also track tutor presence as well. The program is web-based and should be used for tracking student use all tutoring centers in the College by Spring 2014; for example, the College Success Center is also using tutortrac currently.

(ii) At the Clear Lake Campus two student tutors were hired for the Spring 2013 semester and also for the Fall 2013 semester. Each student worked out of the Library for 8 hours a week on a drop-in basis. Students who came for tutoring signed in and out on a Sign-in sheet, and each month the total student hours were calculated and compared with total tutor hours. For each month there has been more than one student-hour for each tutor-hour; and sometimes it has been more than two student-hours per tutor-hour. During the Spring semester tutors were paid with a combination of BSI funds and Federal Work Study (FWS) funds. During the Fall semester both tutors are being paid only with FWS funds.

(iii) Affiliated to the Department is the Yuba College Mathematics, Engineering, Science Achievement (MESA) Program.

<http://ms.yccd.edu/mesa.aspx>

MESA has been at Yuba College for over a decade, and many students have benefited by the support that MESA provided them. The Department supports MESA both directly (for example, by holding Academic Excellence Workshops and reporting students' progress to the Director) and indirectly (for example, by encouraging students to enter MESA). MESA students have transferred to four-year colleges and universities to major in a STEM (Science, Technology, Engineering, and Mathematics) discipline. There is a huge push at all levels of the State and CCC to encourage students to enter a STEM field, and MESA supports this directly. MESA students have also won numerous National Science Foundation and other prestigious scholarships, as well as have attended many leadership workshops and camps. Recently, however, MESA has suffered from a drastic reduction in support by the College and the

District. An apparent consequence of this is that MESA lost its State funding last year and has been operating on a shoestring budget. The Director is now part time, and the direction and the fate of MESA is unclear. Students in MESA populate the transfer-level mathematics courses (Math 1A, 1B, 1C, 2, and 3) and, thus, help us to continue to offer the courses.

(iv) The Department organizes activities to increase student interest in mathematics. Four activities in particular are

o AMATYC Student Mathematics League

<http://www.amatyc.org/?StudentMathLeague>

The American Mathematical Association of Two-Year Colleges (AMATYC) sponsors the Student Mathematics League (SML), a national mathematics contest for two-year college students. YC has administered the SML to our students for over two decades. Until his retirement in 2003, Kenneth Gaal ran the SML at YC. Since then, Kirk Wardlaw has been running the SML at YC. The contest occurs twice a year and an average of 50 students participate each time.

o Math Poetry Contest.

<http://ms.yccd.edu/downloads.aspx#mathpoetry>

A District-wide contest for students every spring semester, the Math Poetry Contest seeks to broaden interest in mathematics through the writing of poetry. The contest is judged by English Department instructors.

o Mathematics Film Festival.

Held during the month of April to coincide with Mathematics Awareness Month, the Mathematics Film Festival. Each week during April a movie or documentary that revolve about mathematics is shown. Students and all College personnel are invited to come to watch.

o Math Day.

Sarah Kovacs organized the 2013 Math Day events that occurred on April 29. This was an all-day celebration that was held in room M-702. The activities included a mathematics puzzle contest, a mathematics art contest, a Sudoku contest, mathematical games, mathematical art activities, and a raffle. Attendees were also given free pizza, buttons, stickers, posters, and other mathematics positive items.

o History of Mathematics Writing Contest.

A District-wide contest for students every fall semester, the History of Mathematics Writing Contest seeks to broaden interest in mathematics through the writing of mathematics history. The contest is judged by English Department and History Department instructors.

<http://ms.yccd.edu/downloads.aspx#hom>

A2. If services are available, how do they demonstrate an increase in student success?

The Department has not measured the effectiveness of the drop-in help provided at the Hard Math Cafe and HMC Annex.

Program Description

B3. How is current and previous program review data used to refine and improve program or department practices?

Each year the Department reviews what it has attempted and what it has accomplished, then sets goals for the next year based on that.

Industry Trends and Program Analysis
(For addition resources: http://yc.yccd.edu/about/research-planning-links.aspx)

C4. How do program or department goals align with the education, diversity, demographic, and workforce needs of local communities?

The Department has student success at the center of its goals. Almost every student that comes to Yuba College eventually needs to take a mathematics course. The Department strives to offer classes to support the various degrees, programs, and certificates on campus. As some of the students plan to transfer to a 4-year college or university we offer a variety of courses, some for liberal arts, liberal studies, as well as calculus and above, for the student to take before transferring. For those students who do not plan to attend a 4-year college or university immediately or at all, the Department plans to offer Math 58 as an alternative to Math 52 in Spring 2014.

C5. How is your program or department direction driven by empirical data?

In 2007--2008 Math 50A Elementary Algebra First Half and Math 50B Elementary Algebra Second Half were introduced as an alternate, slower-paced path through the material covered to meet the learning objectives of Math 50 [see 2007 Program Review]. In 2009--2010 Math 52A Intermediate Algebra First Half and Math 52B Second Half were introduced as an alternate, slower-paced path through the material covered to meet the learning objectives of Math 52 [see 2010 Program Review Update]. We began each by offering only one section per semester of these AB courses. We later offered two sections in a semester, but recently we have returned to offering only one section in a semester because of meager funding. Because of the limited number of sections that were offered, there was not enough data generated to measure the effectiveness of these AB courses. This year, we felt that we have finally had many enough students who have taken the AB courses to attempt to measure the effectiveness of the courses. We decided to begin with Math 52A and 52B. As such, we have requested the following data from the Office of the Vice-President. Specifically, we have asked:

"Of the students who successfully completed both Math 52A and 52B and who enrolled in a subsequent mathematics or statistics course (that has Math 52 as a prerequisite), what percent successfully completed the subsequent course on the first try; and of the students who successfully completed Math 52 and who enrolled in a subsequent mathematics or statistics course (that has Math 52 as a prerequisite), what percent successfully completed the subsequent course on the first try?"

We are awaiting the data. Depending upon the outcome of our analysis, we will decide whether to continue with the AB courses or to abandon them.

Curriculum & SLO Assessment Summary

D6. What has your program or department done to improve completion of degrees, certificates, or transfers? What are your future plans?

(i) The Department created an Associate's in Science -- Transfer (AS-T) degree in 2012--2013 that has been approved by the State. Subsequently, the Department has updated the course descriptions for the following courses to align them with the C-ID descriptors.

Math 1A, 1B, 1C (formerly 2A), 2 (formerly 2B), 3, 7, 9, 15, 21, and 25, and also Stat 1. These courses either support the Mathematics AS-T or support an AD-T in other disciplines (for example, business and psychology).

The Department also created a new course, Math 20 College Algebra, that is listed as a prerequisite in the C-ID course descriptor for Math 1A. Math 20 was offered for the first time at the Marysville campus in Spring 2013.

All of these courses either have received C-ID approval or are currently in the approval process.

Note that because of the change in course numbers, Math 2A to 1C and Math 2B to 2, the Department must now update the AS-T requirements to reflect the changes i in the course numbers. The process has begun in CurricUNET.

(ii) As a result of the change in the Associate's Degree Mathematics Competency requirement in 2006 from Math 50 to a mathematics or statistics course that has Math 50 as a prerequisite, the Department was asked to develop an alternative to Math 52 for those students who were not intending to transfer to a 4-year college or university immediately or at all. The already had Math 51 Geometry in place that would satisfy the new Mathematics Competency requirement; yet the Department responded by developing another course, Math 58 Quantitative Analysis [2007 Program Review]. Math 58 was then offered in Spring 2008 and Spring 2009, but it was canceled each time because of no enrollment. It was believed that students were not interested in Math 58 at that time because many were still able to graduate using Math 50 to meet the Mathematics Competency requirement (they were grandfathered); however, it is now believed that those students have dwindled. Therefore, the Department will offer Math 58 once more in Spring 2014 to see if there is any student interest. The Department will decide after that if we will continue to offer Math 58 or if we will deactivate the course.

(iii) The Department received a request from the Computer Science Department for a new course, Discrete Mathematics, to support their AD-T. The Department is now creating such a new course, Math 17 Discrete Mathematics, in CurricUNET.

(iv) The Vice-President encouraged the Department chairman to consider using Supplemental Instruction (SI) to increase success in mathematics courses. There was a Flex workshop on SI during this year's Fall Convocation week that featured personnel from Butte College who have implemented SI with great success by their measurements. SI involves the hiring of a student tutor who would work closely with a mathematics instructor for a particular course. Therefore, a funding source would need to be identified to implement SI. If a funding source is identified, then the Department may consider implementing SI. Any plan to implement SI must be accompanied by a plan to evaluate the effectiveness of the program in improving success.

(v) The Vice-President informed the Department chairman that State law has been amended to allow community college to require students to begin their remedial English and mathematics courses in their first year. If this is determined to be correct, then the Department may consider approaching the Academic Senate with a proposal to require all students to begin their remedial mathematics courses in their first year. Such a move would almost surely require that additional full-time instructors be hired to staff additional sections of mathematics.

(vi) The Department has staffed sections of Math 110, 111, 50, and 52, and Stat 1 at the Sutter County Center (SCC) with full-time and adjunct instructors since its opening in Fall 2012. In Summer 2013 the Department offered Math 20 College Algebra at SCC for the first time, and again in Fall 2013. The Department will offer Math 21 Trigonometry at SCC in Spring 2014 for the first time. The Executive Dean of SCC has been wanting the Department to offer transfer mathematics courses in addition to Stat 1, and Math 20 and 21 are our first. Math 20 and 21 will lead up to our offering Math 1A Calculus I at SCC in Fall 2014. We note, however, that the Department's full-time instructors are currently stretched very thinly between Marysville and SCC, so it will have to be seen how

we may staff increasingly many transfer mathematics courses at SCC.

(vii) The Department will pilot a "Mathematics Boot Camp" Program in Summer 2014. The Boot Camp will be designed to review topics in basic mathematics that would help students to score higher on the Mathematics Placement Test, as well as to increase their potential for success in their future mathematics courses.

D7. Do you have any courses, certificates, or degrees that should be in-activated or expanded? If yes, please identify and justify your recommendations with data.

(i) The Department will soon be discussing what to do about Math 7 Precalculus, which in the distant past had strong enrollment, but in recent years has had very low enrollment. In recent years until now Math 7 has not been a requirement for any course; Math 7 was only recommended for students who were planning to take Math 1A Calculus I. Now, however, to be aligned with the C-ID descriptor, the prerequisite for Math 1A is either both Math 20 and Math 21 or Math 7. Note that the prerequisite for Math 7 is Math 21, so Math 7 does not provide a shorter path to Math 1A. Enrollment in Math 21 continues to be strong, and enrollment in Math 20, that has been offered since Summer 2013, is also strong. Therefore, the Department needs to decide if the is any reason to continue offering Math 7.

(ii) The Department may consider increasing the number of units for Math 50 and 52 from 4 units to 5 units. This was first mentioned in the 2007 Program Review, but the Department has not considered it seriously since. Increasing the number of units for Math 50 and 52 would not only increase the contact hours with students, and thereby perhaps increase the overall success rate, but it would also bring Yuba College in line with many other California community colleges. Any plan to increase the number of units for Math 50 and 52 must be accompanied by a plan to evaluate the effectiveness of the change in improving success.

(iii) The Department discussed in the past offering a History of Mathematics course that would satisfy the Associate's Degree Mathematics Competency requirement; the prerequisite would be Math 50. Such a course also ought to satisfy the Multicultural Graduation requirement. This was tabled because of the cuts in the number of course sections to help address the District's and College's financial hardships. If the Department is allowed to offer more course sections again, then we may resume this discussion.

D8. Do all of your courses have current CORs? If not, what steps are you taking to ensure compliance?

Yes.

D9. If applicable, how are teaching methodologies in your program or department assessed?

NA.

D10. If applicable, how are the results of the assessment used to support, improve, and/or expand your current teaching methodologies

NA.

D11. If your program or department uses a DE modality to support instruction, how are you evaluating the effectiveness of that instruction?

The Department offers Math 50 Elementary Algebra and Math 52 Intermediate Algebra as online courses, and also as ITV courses. The Department also offers Math 7, Math 20, and Math 21 as ITV courses. The Department has not measured the effectiveness of the instruction for these courses that are offered using a DE modality.

D12. If your department offers DE courses, what support services does it provide for DE students? What can be done to improve support services for these students?

The Department does not provide extraordinary services for DE students. DE students are able to contact their instructors for help via email or other online means, or via telephone. Otherwise, DE students must come onto one of the campuses for organized or drop-in tutoring help. The English Department, through the Writing and Language Development Center (WLDC), is now investigating providing online tutoring help to DE students. The Mathematics Department may consider doing the same after the WLDC has assessed its efforts.

D13. How is your program or department applying sound principles of learning and teaching theory to its curriculum?

The Department faculty members keep up-to-date with pedagogical practices through attendance at conferences and workshops and courses, and through memberships in professional organizations. New ideas are brought back to the classroom to the extent that is possible using the resources that are provided by the College. Unfortunately, this often means that many ideas cannot be piloted or implemented because of a lack of resources.

D14. Which CSLOs (course student learning outcomes) and PLOs (Program learning outcomes) were assessed within the last year?

The Department has developed CSLOs for every mathematics course that is offered, and has assessed every course at least once. The Department intends to assess CSLOs in every course that is offered every semester and summer session. The Department in Fall 2013 fleshed out our PSLOs to be:

1. Perform operations on mathematical objects (e.g. numbers, expressions, functions, matrices).
2. Solve equations and inequalities.
3. Graph equations, functions, inequalities.
4. Solve applied problems using mathematical or statistical methods.
5. Prove identities and theorems.
6. Apply definitions, notation and properties of mathematical concepts.

D15. For each of the above, how did the assessment data influence program, department and/or course improvement?

The Department determined that the CSLOs are deficient and do not provide enough information about the outcomes of a course. Therefore, the Department is currently in the process of revising the CSLOs for each course, beginning with Math 52 Intermediate Algebra, that would align with the PSLOs. Following this, new assessment methods will be devised and tested.

Goal Type

Yuba College Goal

E16. How do program or department goals align with stated Yuba College goals?

The Department goals align to the stated Yuba College goals in the following ways:

1. "Foster a culture of evidence-informed decision making, including SLO development/assessment and other measures of student success"

This year the Department is working to improve our CSLOs and assessment methods so that the data can be better used to make decisions.

2. "Prioritize and allocate resources based on existing and emerging community and student needs over those of individual projects or programs"

The Department continues to offer more classes at SCC to meet the students' needs.

5. "Design our programs in such as way as to allow students to complete their educational goals in a timely manner."

The Department is offering more courses at SCC. Also, the Department will be offering Math 58 as an alternative option to Math 52 for students who do not plan to transfer to a 4-year college or university immediately or at all.

6. "Evaluate our programs, services and processes to ensure continuous quality improvement"

The Department is meeting monthly this year to improve the CSLOs and assessment. This provides the Department an opportunity to discuss improvement.

7. "Improve the quality of the student experience at all our campuses and centers"

The Department maintains and staffs the Hard Math Cafe in room M-700 and the Hard Math Cafe Annex in room M-702 that provides for drop-in help for mathematics students.

<http://ms.yccd.edu/hard-math-cafe.aspx>

The Hard Math Cafe (M-700) adjoins the MESA Center (M-701) and is the original Hard Math Cafe. Currently, most of the drop-in help occurs in the HMC Annex (M-702), where instructors hold some or all of their office hours to staff the Annex. Student tutors have also been hired using BSI funds to fill in the gaps in staffing the Annex.

Student tutoring help is also available at Marysville and at SCC through the College Success Center. At the Clear Lake Campus two student tutors were hired for the Spring 2013 semester and also for the Fall 2013 semester.

YCCD Board of Trustees Vision

E17. How does the program support the YCCD District Vision Statement? Specifically, how does the program meets the needs of our students and communities?

"Providing an innovative, world-class learning environment"

The Department faculty members keep up-to-date with the mathematical discipline and with pedagogical practices through attendance at conferences and workshops and courses, and through memberships in professional organizations. New ideas are brought back to the classroom to the extent that is possible using the resources that are provided by the College. Unfortunately, this often means that many ideas cannot be piloted or implemented because of a lack of resources.

Equipment/Technology

Technology

F18. To what degree does your program or department have adequate and appropriate technology to support effective instruction (e.g., software, computers, and information technology)?

(i) Minitab for Stat 1 was updated to version 16 at all sites; however, the update was not installed on statistics instructors' computers.

(ii) Aside from using Minitab in Stat 1, the Department does not currently incorporate the use of technology such as graphing calculators or personal computer software (such as Mathematica or Matlab, or their open source counterparts such as Maxima or Octave) in the mathematics curriculum. The Department has resisted doing so mainly because of the perceived negative impact that such a requirement would have upon our students, for we are situated in a lower economic community. Many community colleges and, perhaps more importantly, many 4-year colleges and universities to which our students may transfer do expect their students to learn and use such technology. Therefore, we may investigate the feasibility of incorporating the use of technology in parts of the mathematics curriculum. Incorporating the use of technology may require additional funding to purchase the appropriate software, and so on, and to have on deck the necessary support staff.

(iii) Many instructors are using MyMathLab, a web-based homework and testing management system, for Math 50 and 52, and some instructors are using WebAsign in some other courses. Increasingly many textbooks may be purchased bundled with access to such web-based enhancements. There has not been an analysis to determine the effectiveness of these web-based enhancements in improving success.

Equipment

F19. To what degree does your program or department have adequate and appropriate equipment (other equipment, not computers or IT related).

None of the older classrooms at the Clear Lake Campus are equipped with a document camera (e.g., Elmo). A document camera in the main mathematics classroom (room C-603) would be helpful for illustrating graphing techniques on graph paper. A document camera would also be useful for demonstrating how to solve problems while facing the class and for sharing work done by students or the instructor without having to copy it out on the whiteboard.

Facilities

G20. To what degree does your program or department have adequate facilities to support effective instruction? Please explain.

The Mathematics Program does not have adequate facilities.

(i) The College employs a sizable number of mathematics adjunct instructors, and there is a need for mathematics adjunct faculty

members to work and to meet with students. Many of the mathematics courses offered are taught by adjunct faculty members, and so many students are served by adjunct faculty members. Most of our adjunct faculty members travel here from outside the Yuba-Sutter area, and it would be very helpful for them to have a place to meet students privately, as well as a place to work in between classes and to leave their belongings in between classes.

(ii) There is an acute need for modern classrooms. Presently many mathematics classes are taught in temporary classrooms (the "swing space": M-3003 and M-3004) because there are not enough available permanent classrooms for mathematics. Mathematics classes are also taught in classrooms (M-607 and M-713) that do not allow the classes to enroll to cap. Many mathematics courses are now taught in classrooms that do not include at least better (larger) student desks that would provide students with a greater working area, as well as provide instructors the flexibility to present lectures, conduct small group activities, &c.; wide writing spaces for instruction (several blackboards or whiteboards, or both); flexible projection systems; and Internet access.

N.B. The temporary classrooms will be removed by Spring 2014 and will no longer be available. Space now needs to be found for the mathematics classes that were scheduled to be held there in Spring 2014.

The minimal solution would be for the College to upgrade existing classrooms or make available existing classrooms or construct new classrooms that would be suitable for our teaching mathematics today. The optimal solution would be to construct a new building that would house the Mathematics, Engineering and Drafting, and Computer Science programs. The building should be two stories, with classrooms and engineering laboratory on the first floor; and computer laboratory, MESA, the Hard Math Cafe, student and staff lounges, a meeting or conference room, and faculty offices on the second floor. See Brian Birgen's article, "How to design a mathematics building," _Focus_, May/June 2005; URL below.

<http://www.maa.org/sites/default/files/pdf/pubs/june%2005web.pdf>

There is a huge push at all levels of the State and CCC to encourage students to enter a STEM (Science, Technology, Engineering, and Mathematics) field. A new building for the Mathematics, Engineering and Drafting, and Computer Science programs would go a very long way towards making Yuba College a Premier College for STEM in the North State.

Faculty

H21. Does this program or department have adequate full-time faculty to support a high quality program? Please explain.

No.

(i) It is recommended that YC hire at least two (2) additional full-time mathematics instructors at Marysville.

In 2013 YC hired one new full-time mathematics instructor, Christopher Noffsinger, who started his full-time employment in Fall 2013. With Noffsinger, the Department now has 7.5 full-time FTEF assigned to Marysville and 1 full-time FTEF assigned to CLC. The full-time instructors at Marysville are having to cover some sections of mathematics and all the sections statistics at SCC; and this strain will only increase if SCC offers more transfer mathematics courses as it intends. Additionally, in the short term, of the 7.5 full-time FTEF assigned to Marysville, one currently has 40% release time to be the Director of the College Success Center, and one has 20% release time to be the Flex Coordinator.

We note that (i) as of October 18, 2013, there are 17 unstaffed sections of Math 52 and below for Spring 2014; (ii) we do not anticipate being able to staff these sections with adjunct instructors; (iii) we do anticipate this to be an ongoing problem because it has become increasingly difficult to find suitable adjunct instructors to increase our adjunct pool.

To meet all of this demand that we anticipate will continue into the foreseeable future, therefore, YC must hire at least two (2) additional full-time mathematics instructors.

From the data provided by the Office of Research, Planning, and Student Success, we find that the 2011--2012 Adjunct FTEF/Full-time FTEF ratio was the highest between 2007 and 2012; unfortunately, data for 2012--2013 is not available.

Adjunct FTEF/Full-time FTEF ratio
2012--2013: ?
2011--2012: 1.82
2010--2011: 1.10
2009--2010: 0.98
2008--2009: 1.13
2007--2008: 1.37

In 2011--2012 the full-time FTEF was 6.91, and in the 2012 PRU we reported that the College hired one full-time mathematics faculty member, Kathryn Vaughan (now Kathryn Boyes; replaced Catherine Heaton, who retired at the end of Spring 2011), who began in Fall 2012. At that time, we noted that, "There remains a very great need to hire at least one (1) full-time math faculty member for Yuba College, particularly one who meets minimum qualifications to teach statistics" [2012 PRU, page 3 of 22]. Since then, the College has hired another full-time faculty member, Christopher Noffsinger (replaced Lauren Syda, who retired at the end of Fall 2012), who began in Fall 2013 and who meets the minimum qualifications to teach statistics; so it appears that the Department's full-time staffing needs have been met presently. However, the 2012 PRU did not account for SCC, and with the opening of SCC there is now a need again for the College to hire at least two (2) full-time mathematics faculty members, preferably with at least one who meets the minimum qualifications to teach statistics.

Data from the Office of Research, Planning and Student Services. (Data from 2012--2013 is not available.)

YEAR*	FTEF**	FTES**	WSCH**	WSCH/FTEF**
2012--2013	?	?	?	?
2011--2012	19.47	652.47	19,574.10	503
2010--2011	17.51	666.30	19,989.00	571
2009--2010	18.45	637.45	19,123.50	518
2008--2009	19.15	710.69	21,320.70	557
2007--2008	18.56	655.94	19,678.20	530
Five Year Average	18.63	664.57	19,937.10	535

*Data from 2007-8 include all Distance Education sections.
**Program data; not restricted to Marysville.

The requested position would help with staffing at SCC, particularly because SCC seeks to expand offering transfer-level mathematics and statistics courses, and to staff an expanded offering of transfer-level mathematics courses at Marysville (the addition of Math 20 and the request by the Computer Science Department for the creation of a new course, Math 17 Discrete Mathematics).

We note that in the short term we shall continue to suffer the temporary reassignment of Karsten Stemmann (20%; Flex Coordinator) and Roger Davidson (40%; College Success Center Director); moreover, Davidson plans to go on sabbatical in 2014--2015.

The Department routinely offers many sections of mathematics courses needed for degree and transfer requirements. Many of the

courses are designed for biology, engineering, physics, elementary education and other disciplines. The WSCH/FTEF ratio is very large given the wide array of demands put on the department. Almost all students at Yuba College take at least one mathematics course.

Nearly half of the mathematics students are taught by adjunct instructors. In Fall 2012 we had to cancel one section of Math 111 because it could not be staffed; in Spring 2013 we had to cancel one section of Math 50 and one section of Math 52 because they could not be staffed; and in Fall 2013 we had to cancel one section of Math 110 because it could not be staffed. This is a recent phenomenon for the Department, and one that we hope will not continue. However, we note that for Spring 2014, as of October 18, 2013, we still had 17 sections of Math 52 and below at both Marysville and SCC that are unstaffed and we have exhausted our adjunct pool: 12 at Marysville and 5 at SCC. (We have not received any new applications for adjunct employment and very likely will not receive any soon.) Furthermore, all transfer-level courses, collectively referred to as "singletons" because they are usually single-section courses, are staffed by full-time faculty members, and we typically do not cancel singletons; therefore, any courses that would be canceled because they are not staffed would almost totally consist of the developmental and remedial mathematics courses (Math 52 and below). These sections are always wait listed, and cancelation of these sections would surely delay the progress of students toward their educational goals.

Finally, we note that

o Roger Davidson plans to go on sabbatical in 2014--2015, and that he intends to retire in 2019.

o John Thoo plans to go on sabbatical in 2016--2017.

(ii) It is recommended that YC hire at least one (1) additional full-time mathematics instructor at CLC.

This recommendation was made in the 2012 PRU. At that time---and it still holds true now---we noted that there is only one full-time mathematics faculty member at the Clear Lake Campus. Due to its location it is very difficult to find adjunct math faculty who meet the minimum qualifications for mathematics in the Clear Lake area. This is the reason the adjunct FTEF (EP/NC/etc.) numbers are so low at CLC, and in fact most of that (EP/NC/etc.) is due to EP. Because of this the campus can only offer one section at most of the developmental courses and one section of a transfer level course (usually Stat 1). As a result, it is challenging for students to access the mathematics and statistics courses they need in order to make progress in a timely fashion, either because a course is full, or the only time it is offered conflicts with another course they need. When there is only one section offered for the developmental math classes, they fill up and are waitlisted. When a second section has been added, there are plenty of students for each section. The best solution is to hire another full-time mathematics faculty member at the Clear Lake Campus so that course offerings can be expanded and students will have the options they need to make progress toward their goals.

(iii) There is a need to provide 20% release time to one full-time faculty member to assume the responsibilities of a Department Principal (chairman or chairwoman or coordinator).

There is a need for one person to have an overall awareness of the issues that impact the Department from both within and without the College and District.

As we noted in the 2012 PRU, there has been a large increase in the number of mathematics adjunct faculty members that requires an increase in the coordination of schedules, expectations, &c.

YC and WCC offer a common curriculum. There are district-wide common final exams in Math 111, 50, and 52. YC offers both AS and AS-T degrees in mathematics as well. There is a need to work with local high schools to smooth their students' transition into taking math courses at YC. There is a need to maintain communication with 4-year colleges and universities to which our students transfer, notably with UC Davis, CSU Chico, CSU Sacramento, and U. of the Pacific, to ensure that our students are adequately

prepared.

There are also many other things for which a Department Principal would be responsible that have not been written here. But these have been written that you may come to believe that there is indeed a need for a full-time faculty member to be provided at least 20% release time to assume the responsibilities of a Department Principal.

Staffing

I22. Does this program have adequate technical/clerical staff to support a high quality program?

Faculty and Staff Support and Professional Development

J23. In the last year, what professional development or networking has faculty and/or staff participated in?

Kathryn Boyes

o Attended Reading Apprenticeship Workshop at Yuba College (February 2013)
o Attended the Sacramento Valley Community College Mathematics Conference at Sacramento City College (March 2013)
o Attended the Supplemental Instruction Workshop at Yuba College (August 2013)

Roger Davidson (50% Mathematics)

o Attended the Summer Engineering Teaching Institute (SETI) at Canada College (May 2013)
o Presented at SETI on two technologies, MasteringEngineering and Piazza (May 2013)
o Participated in the MAA PREP Workshop "Big Data" at Williams College, MA (June 2013)

o Plans to go on sabbatical in 2014--2015 to obtain a graduate certificate in Mining Massive Data Sets from Stanford U. in order to inform possible new interdisciplinary curriculum between statistics and computer science.

Sarah Kovacs

o Attended the California Mathematics Council, Community Colleges 2012 Fall Conference at Monterey
o Will take a Reading Apprenticeship course online in Spring 2014 in order to implement RA strategies in either Math 52A or Math 52 to start.

o Plans to take an online course in Reading Apprenticeship in Spring 2014 to implement RA in either Math 52A or Math 52 to begin.

Michael Papin

o Attended the California Mathematics Council, Community Colleges 2012 Fall Conference at Monterey
o Attended the Sacramento Valley Community College Mathematics Conference at Sacramento City College (March 2013)

John Thoo

o Guest editor for the journal Problems, Resources, Issues in Mathematics Undergraduate Studies (PRIMUS) Special Issue on the

Use of History of Mathematics to Enhance Undergraduate Mathematics Instruction (August 2012--present)
o Attended History and Pedagogy of Mathematics (HPM) Americas Section 2012 West Coast Meeting at UC Berkeley (October 2012)
o Attended the California Mathematics Council, Community Colleges 2012 Fall Conference at Monterey
o Attended the AMS-MAA Joint Mathematics Meetings at San Diego (January 2013)
o Attended the MAA Golden Section Section Meeting at University of the Pacific (February 2013)
o Attended the Sacramento Valley Community College Mathematics Conference at Sacramento City College (March 2013)
o Published an article, "Binary powering in ancient India," _MathAMATYC Educator_, Vol. 4, No. 3 (May 2013)
o Chairman of the MAA Golden Section Committee for Distinguished College or University Teacher of Mathematics (2012--2013)
o Member of the editorial board of PRIMUS (2012--2013)

J24. How did these activities contribute to student success? (include supportive data)

These activities have helped Department faculty members to keep up-to-date with the mathematical discipline and with pedagogical practices through attendance at conferences and workshops and courses, and through memberships in professional organizations. New ideas are brought back to the classroom to the extent that is possible using the resources that are provided by the College. Unfortunately, this often means that many ideas cannot be piloted or implemented because of a lack of resources.

J25. How does professional development in your program or department support basic skills students and foster inclusive classroom environments that value diversity?

There is a lack of organized professional development for mathematics instructors in the College. All the professional development have been undertaken at the personal initiative of the Department faculty members. Nevertheless, there is a culture within the Department that seeks to support all students, from the basic skills students to the transfer students, and to foster inclusive classroom environments that value diversity, i.e., a broad view and appreciation of mathematics.

J26. What Staff Development activities would you suggest be offered in the next year that would enhance your program?

Time and material support should be made available for mathematics faculty to meet regularly for the purpose of discussing and sharing mathematics and the teaching of mathematics. A monthly brown bag seminar, session, or lunch would be one way to accomplish this if the Department faculty members would be afforded the time and the material support for it.

<http://en.wikipedia.org/wiki/Brown_bag_seminar>

Course Content and Statistical Analysis:

B3. How is current and previous program review data used to refine and improve program or department practices?

Each year the Department reviews what it has attempted and what it has accomplished, then sets goals for the next year based on that.

Industry Trends and Program Analysis
(For addition resources: http://yc.yccd.edu/about/research-planning-links.aspx)

C4. How do program or department goals align with the education, diversity, demographic, and workforce needs of local communities?

The Department has student success at the center of its goals. Almost every student that comes to Yuba College eventually needs to take a mathematics course. The Department strives to offer classes to support the various degrees, programs, and certificates on campus. As some of the students plan to transfer to a 4-year college or university we offer a variety of courses, some for liberal arts, liberal studies, as well as calculus and above, for the student to take before transferring. For those students who do not plan to attend a 4-year college or university immediately or at all, the Department plans to offer Math 58 as an alternative to Math 52 in Spring 2014.

C5. How is your program or department direction driven by empirical data?

In 2007--2008 Math 50A Elementary Algebra First Half and Math 50B Elementary Algebra Second Half were introduced as an alternate, slower-paced path through the material covered to meet the learning objectives of Math 50 [see 2007 Program Review]. In 2009--2010 Math 52A Intermediate Algebra First Half and Math 52B Second Half were introduced as an alternate, slower-paced path through the material covered to meet the learning objectives of Math 52 [see 2010 Program Review Update]. We began each by offering only one section per semester of these AB courses. We later offered two sections in a semester, but recently we have returned to offering only one section in a semester because of meager funding. Because of the limited number of sections that were offered, there was not enough data generated to measure the effectiveness of these AB courses. This year, we felt that we have finally had many enough students who have taken the AB courses to attempt to measure the effectiveness of the courses. We decided to begin with Math 52A and 52B. As such, we have requested the following data from the Office of the Vice-President. Specifically, we have asked:

"Of the students who successfully completed both Math 52A and 52B and who enrolled in a subsequent mathematics or statistics course (that has Math 52 as a prerequisite), what percent successfully completed the subsequent course on the first try; and of the students who successfully completed Math 52 and who enrolled in a subsequent mathematics or statistics course (that has Math 52 as a prerequisite), what percent successfully completed the subsequent course on the first try?"

We are awaiting the data. Depending upon the outcome of our analysis, we will decide whether to continue with the AB courses or to abandon them.

Are you ready to submit your final program review?: Yes