May 11, 2010

TO: Chancellor’s Task Force on the Achievement Gap and Student Equity

FROM: Dennis Piontkowski, Mathematics Department Chair

SUBJECT: Update on Mathematics Department Student Equity Action Plan

There is an achievement gap in mathematics. Black, Latino, Filipino, and Pacific Islander students collectively have lower success rates in math than students from other ethnic groups. This does not mean that all Asian students are good at math, nor that all Black students have trouble. Many Asian students flounder in their math classes while many Black students excel. However, it is troubling for educational institutions, and frustrating for individual instructors, to see that there truly does appear to be a racial divide in success in mathematics.

In early March 2010, the Mathematics Department formed a Student Equity subcommittee of the department’s own curriculum committee. The task of the subcommittee is to make recommendations on new department proposals to address the Achievement Gap in mathematics as described in the Preliminary Report on the Student Achievement Gap and Social Equity of October 2009. In forming its recommendations, the subcommittee is to take into account concerns raised at the equity hearings of February 2010.

For years, the Mathematics Department has devoted energy and resources to closing the achievement gap: MATH E, Math Bridge, the NIH Science Scholars Program, the Math Lab, LAC partnerships, and Retention Center partnerships and tutoring. These are successful endeavors, but we need to do more.

Currently, students who plan to transfer to a university may be asked to take as many as three mathematics classes, depending on their initial skill level, before being allowed to take required transfer level mathematics. The three classes are MATH E3 (or MATH E1) Basic Math, MATH 840 Elementary Algebra, and MATH 860 Intermediate Algebra. Students in majors requiring calculus need to take several more math classes. The attached chart illustrates these sequences.

**Student Access to Math Classes**

Over 2000 students are turned away from CCSF math classes every semester. This IS an equity issue: students of color are disproportionately represented at the basic skills level which means that many students of color need to get through several math courses in order to graduate or transfer.

We even turn away large numbers of students from calculus classes. At a time when we should be promoting STEM majors (science, technology, engineering, math) to our students of color, we have instead put up the NO VACANCY sign.

Of course, the budget crisis requires that we moderate some of our initiatives. Also, we need to experiment with sequencing options that can reduce the number of classes a student needs to take. No one wants high school graduates to have to start over in their mathematical education when they enroll at CCSF. But we also need to make every effort to provide classes that our students need.
Math Department Equity Initiatives

The Mathematics Department Student Equity subcommittee has focused on pedagogical initiatives within the department that will help to close the achievement gap. Its proposals fall under the following areas:

- The Algebra Sequence: MATH 840/MATH 860
- Basic Math/ Prealgebra: MATH E3 (or E1)/MATH 835
- Math for STEM majors (STEM = Science, Technology, Engineering, Math)
- Course Placement

I’ll focus on the first bulleted area in this report with initiatives separated into two categories: (a) those that can be implemented between now and Fall 2011 and (b) those that require more discussion and development.

The Algebra Sequence: MATH 840/MATH 860
Fall 2010-Fall 2011 Initiatives

1) Revised Curriculum and New Course Outlines
Since the start of Fall 2009, the math department has been working to revise the curriculum and rewrite the course outlines for MATH 840 and MATH 860. We hope to present final drafts of these outlines to the college Curriculum Committee next fall, in time for the outlines to take effect in Spring 2011. The new outlines will more clearly delineate the differences in content and level between 840 and 860 than the current outdated outlines and thus will greatly facilitate department discussions about course sequencing initiatives.

2) Student Satisfaction Survey
The department has created a survey to be given to 840 and 860 students near the end of each semester. We would like students to tell us what worked and what didn’t work for them in their class. We want students to describe their own successful learning strategies and any barriers to success that they have encountered at CCSF. We will also survey students on their opinions about Pass/No Pass grading.

3) 840/860 Cohorts
Target implementation: Fall 2010
Starting next fall, several algebra instructors will teach MATH 840 followed by MATH 860 in consecutive semesters. Thus, students will have the option of taking the same instructor for both courses in the sequence. Up to now this practice has been fairly rare.

Student familiarity with an instructor’s teaching style, testing, and grading practices should improve the likelihood of success in the second class. The highly successful Math Bridge Program which targets Black, Latino, and Filipino students takes a cohort of students through the 840/860 sequence with the same instructor. The consistency of instructional delivery clearly contributes to Math Bridge success. The 840/860 cohort proposal outlined here is a cost effective way of making some of the benefits of Math Bridge available to more students.

We hope to schedule the consecutive cohort classes at the same hour and in the same classroom. This should make it easier for students to plan early for the second semester. Also, students who are successful in the first semester course should be guaranteed seats in the second semester course. We hope that the CCSF registration priority system can accommodate this endeavor.
4) Condensed Algebra Sequence  
**Target implementation: Spring 2011**
We propose piloting short-term intensive sections of MATH 840 and MATH 860, two sections of each in both fall and spring semesters. The short-term 840 would be offered 2 hrs/day M-F for the first 8 weeks of the semester. The short-term 860 would be offered 2 hrs/day M-F for the last 8 weeks of the semester.

Instructor assignment and scheduling should be relatively easy. One challenge is registration: _students who are successful in the first short-term course should be guaranteed seats in the second short-term course_. Since there will likely be some attrition, a certain number of students who did not take the first short-term course should be allowed to register for the second course only.

Counselors will have to be advised to recommend this pathway to highly motivated students who have enough time available outside of class to keep up with assignments.

5) Math Study Skills Course  
**Target implementation: Fall 2011**
The CCSF College Success curriculum needs to be expanded to a Math Study Skills course. While the college offers general College Success courses, we have no course devoted to success in math classes. This new course would bear the LERN prefix but would be taught by a math instructor or possibly, taught by a counselor and math instructor as a team. A math instructor is needed to teach math-specific study skills. Sections of the Study Skills class could be linked with some sections of 840 or 860.

6) MATH 860 Competency Exam  
**Target implementation: Fall 2011**
A certain number of students with strong algebra skills place incorrectly into MATH 840. Before they register for a math class they have the option of retaking the placement test. But several of these students do not become aware of their incorrect placement until after they have taken 840 and do very well in that class. They feel that also having to take MATH 860 is unnecessary. We should offer such students the option of taking a MATH 860 competency exam. A satisfactory score on such an exam would allow a student to skip MATH 860 in the algebra sequence.

The 860 competency exam could also be taken by students to satisfy the new Associate degree math grad requirement. Currently, students can satisfy the new grad requirement by obtaining a sufficiently high score on the Algebra Placement Test. But the placement test is a correlative instrument; it is not a skills test and does not measure competency. The competency exam would return the placement exam back to its proper role.

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### The Algebra Sequence: MATH 840/MATH 860  
**Initiatives Requiring More Discussion and Development**

1) Expanded Math Lab  
**Target implementation: uncertain**
Currently, the Math Lab is housed in the temporary 600 Bungalows. The Math Lab is a highly effective tutoring and computer study lab that focuses primarily on MATH E and MATH 840 students. The lab was expanded using Title III funds back in 2005, but the lab has reached capacity and now is often overcrowded, not to mention understaffed. Officially, MATH 860 students are currently directed to the LAC for tutoring, yet many 860 students continue to use the Math Lab. Logically, it makes sense that a
student working through the 840/860 sequence should be able to get extra help in the same place for both classes. The “jump” to LAC tutoring should take place at the transfer level which students reach after MATH 860. Therefore, we should have a long-term goal of expanding the Math Lab to serve 860 students, and thus serve all pre-collegiate math students in one tutoring location.

2) Algebra Pathway Sequence leading to Statistics
This would be an alternative to the traditional 840/860 sequence (which does not contain topics from Statistics) designed for students whose last college math class will be transfer level Statistics. Concerns: Is this a form of tracking? Will students be pigeonholed with certain career options eliminated? A “Stats-trak” needs to be balanced with MESA/STEM initiatives that target students of color.

3) Intermediate Algebra level course designed for Health Science Majors
Think: contextualized Intermediate Algebra with applications to Health Sciences. This course would serve Associate degree students. Concern: would this course be appropriate for RN students who might eventually hope to attain Bachelor’s in Nursing or Master’s in Nursing?

4) P/NP Option for 840 and 860
There has been a lot of discussion concerning Pass/No Pass for precollegiate math courses. We will be surveying 840 and 860 students this semester to determine their feelings about the P/NP option.

5) Peer Mentors
Establish a system of peer mentors to assist and advise students in precollegiate math classes. The mentors would be CCSF students who have recently been successful in the E/840/860 sequence.

Other Math Initiatives Currently Being Discussed

What follows is a brief summary of other high priority student equity items that fall outside of the MATH 840/860 curriculum.

Basic Math/ Prealgebra: MATH E3 (or E1)/MATH 835
1) Revise the MATH E and MATH 835 curriculum.
2) Develop more contextualized content.
3) Create a new condensed MATH E3/835 course.

Math for STEM majors (STEM= Science, Technology, Engineering, Math)
1) Create a Math Bridge at the MATH 90/MATH 95 level
2) Establish retention center math sections targeting students of color for STEM majors
3) Promote a college-wide culture that is positive about learning math and science

Course Placement
1) Revisit our placement tests and re-evaluate cut-off scores.
2) Create a MATH 860 Competency Exam. The exam could be taken by students who wish to meet the AA degree math requirement and by students who wish to jump from MATH 840 to transfer-level.
Math Transfer Sequence for CSU-bound Liberal Arts Majors

Possible Transfer Level Courses: MATH 70, MATH 75, MATH 80, MATH 90, MATH 95, PSYC 5, ECON 5, PHIL 12A, ET 50.

NOTES:
1) Students are NOT required to take geometry, unless they intend to take MATH 90 or MATH 95.
2) MATH 90 and MATH 95 are intended primarily for students who will continue on to higher level math.

Math Transfer Sequence for Students Requiring Calculus

NOTES:
1) Geometry is required for students taking MATH 90, MATH 95, and Calculus.
2) Students intending to take Calculus are strongly encouraged to take MATH 855 Geometry, but MATH 850 is acceptable.
3) MATH 97 is not part of the regular sequence leading to Calculus. MATH 97 is meant for students who have already learned MATH 90 and MATH 95 material, but need a review before taking Calculus.
4) Students who take MATH 90 and MATH 95 do NOT normally take MATH 97.
5) Students may take MATH 95 before, or concurrently with, MATH 90, but we strongly encourage them to take MATH 90 first.
6) MATH 92 is equivalent to MATH 860 and MATH 90 combined into one course. MATH 92 is extremely intense and probably not a good fit for most students.