

**2007/08 Academic Program Review  
Department of Mathematics**

**F. Implementation Plan: *Final Implementation Plan***

**F. 1. Key recommendations of the program faculty resulting from the self- study.**

Recommendation 1: Hire one new faculty member by Fall 2011 in Math Education with an emphasis in either elementary or secondary math curriculum or instruction. Hire a second faculty member by Fall 2012 in Math Education to complement the faculty member hired in Fall 2011. Hire a third faculty member in Fall 2014 to replace Dr. Feldman's position, who retired in June 2008. In addition, we need to hire replacement faculty for retirements that occur. The Department anticipates that there may be four faculty retirements in the next 7 years.

Recommendation 2: Obtain adequate space, computers and technology to create a learning community of faculty and math students. We intend to do this by reconfiguring the space in DBH when Nursing is reassigned to the old Science Building. We propose to convert DBH 261 into a Computer Teaching lab with 30-35 computer workstations – maintained by OIT. The Math Department will have priority in the use of the lab. For example, we propose to use it for teaching classes that use *ALEKS*, *Mathematica*, *Geometer's Sketchpad*, *MATCAD*, and other appropriate software. In addition, DBH 252 will be remodeled into a student study hall/conference room and DBH 250 into a consulting and coaching room for conducting faculty/student research.

Recommendation 3: Obtain adequate resources for the faculty to do research to publish in refereed journals as well as to engage the students in the faculty research or in projects that will expose them to research and make the learning meaningful. In order to do this effectively, faculty will need support to seek external funding.

Recommendation 4: Explore the possibility of a Master's Degree in the Teaching of Mathematics with the College of Education's current efforts in setting up a Master's Degree in Education. Explore the possibility of teaching some of the math courses on-line and via self-support programs via Extended Education.

Recommendation 5: Decrease the cost of offering remediation courses by adapting the applicable programs and suggestions from the Chancellor's Initiative Transforming Course Design (TCD). This ties in with Recommendation 2 as TCD found that using technology is a *sine qua non* for success in this area.

Recommendation 6: Expand the Math/Computer Science Speaker Series to include Physical Science Departments, and obtain the needed additional funding to invite two renowned speakers per year.

Recommendation 7: Obtain site license for *Geometer's Sketchpad*, and encourage its usage in Math 3060 (Modern Geometry) and other appropriate courses as recommended by the California Commission on Teacher Credentialing.

**F. 2. Anticipated student profile in terms of number and type of students over the next seven years.**

What will the student profile be? There will be two types of students – one to fit the math majors in F.2.a. and the other to fit the classroom teachers in F.2.b. The first set will be classroom teachers who would want to earn professional credit and an advanced degree while working full-time. The second set will be less rigorous in their approach to problem solving, more proficient in applying technology to create multiple scenarios to solve a problem, needing greater assistance in writing skills, open to a more flexible scheduling of classes and wanting to do projects that have social significance and human value.

**F.2.a.** We expect California schools will follow the lead of some other states and open a position for a math content/curriculum expert at the schools. California schools have mentor teachers who are teachers with experience at the level they are teaching but whose depth of mathematical content and the awareness of research in math

education and pedagogy are not sufficient to meet the challenges of the rigorous curriculum. This in turn will prompt more university service area schoolteachers to pursue Masters in Math Education or a Ph.D. or Ed.D. in Math Education.

**F.2.b.** We also anticipate that the number of math majors will increase in the next seven years. This is because math is no longer the property of a few pure mathematicians. Technology, cyber learning, and the interfacing of math with biology, medicine, economics, anthropology has increased the accessibility of mathematics to more students. We can tap into this trend by offering a program in applied and industrial mathematics.

**F. 3. Action steps to be taken in order to achieve each of the recommendations and student enrollments over the next seven years.**

Our action plan to achieve the recommendations in F.1. are the following:

Hire three tenure-track faculty over the next seven years to meet the current demands (by getting a replacement for Dr. Feldman) and to meet the Chancellor's mandate of doubling the number of credentialed teachers in math and science (MSTI). In addition, we will have to hire tenure-track faculty to fill the vacancies created by the retiring faculty.

Submit request for space to the Dean and Provost to remodel DBH 250, DBH 252 and DBH 261 when the Nursing Department relocates to the old Science Building. If the old Science Building is not remodeled during the next seven years, we will request that some of the adjoining offices on the second floor of DBH be remodeled creatively to allow for more space and furniture, conducive to a study hall and research room for math students and faculty.

Seek outside funding resources to allow faculty members to apply for research grants.

Conduct the feasibility study for the Master's Degree in Teaching Mathematics and follow through with the outcomes of the study with CNS Dean and Provost.

Explore funding to invite two renowned speakers for our Math/Computer Science Speaker Series.

Request OIT to purchase *Geometer's Sketchpad* and install it in all computer labs and on faculty computers.

Our action plan to achieve the recommendations in F.2. are the following:

We plan to continue the strategies discussed in section B.2. as this strategy has not only helped the department to recruit math majors but also enabled their retention. As the student body in the next seven years will have a different focus and their profile – as stated in F.2., we will redesign the program to meet their needs. We intend to offer a more flexible schedule with easy access to cutting edge technology, thus reaching a broader base of students.

**F. 4. Types of human, fiscal, and physical resources needed to implement recommendations.**

Human Resource Needs:

- By Fall 2011 hire one tenure-track faculty in Math Education- preferably with an emphasis on elementary or secondary math curriculum and instruction.
- By Fall 2012 hire a second tenure-track faculty in Math Education to complement the one Math Education faculty and to meet the increase enrollment of students in math courses resulting from the implementation of MSTI (Math and Science Teacher Initiative).
- By Fall 2014, hire a tenure-track faculty to replace Dr. Feldman's position who retired in June 2008.
- Between Fall 2010 and Fall 2014 hire tenure-track faculty to replace those retiring during this time period.
- By no later than 2013, hire two Full-Time Lecturers, one to lessen our dependence on part-time instructors.
- Have allocations to hire one student assistant to work in the office to meet the increasing need for assistance to

the one Administrative Support Coordinator whose workload is impeding the staff support needed for the faculty's research, travel and paperwork needed to be done to seek external funding opportunities.

Fiscal Resource Needs:

- Funds equivalent to 12 WTU's of release time a year for the math department for faculty.
- Grader money: \$12,000 per year.
- Seek funding to bring two speakers to the math speaker series: honorarium \$1,000 per year.
- Travel funds for faculty to attend state, national and international conferences: \$5,000 per year.
- Travel funds for students to attend state and national conferences: \$2,000 per year.
- Need resources to train the faculty to offer math courses online. Resources may be release time and/or funds needed to redesign the curriculum, if warranted, and to get specialized training to teach online.

Physical Resource Needs:

- Equip the classrooms where math classes are held with better chalkboards and projectors which do not interfere with students' view of chalkboards/screens.
- Assign classroom with tables for the classes that do not use lecture as the primary instructional mode.
- Reconfigure space in DBH when Nursing is reassigned to the old Science Building as indicated in F.3. above.
- Get a larger math office for the math department.
- Get an office for the math department chair with separate desk and chair to confer with faculty and students.
- Upgrade the Xerox machine, shredder and Fax machine.
- Get two heavy-duty black and white printers and a heavy-duty color printer.

Other Comments:

- Reduce the teaching load! Reduce the teaching load! Reduce the teaching load!
- Reduce both the number of units taught as well as the enrollments in some of the classes so the instructor can pay attention to student needs.
- Increase the time interval between classes. The physical set up of the campus and the scheduling of classes does not allow adequate time for faculty/students to get from one building to another when back-to-back classes are scheduled. For example, Naraghi Hall to Classroom building and/or DBH is too far to reach for a back to back class in 7 minutes.