

4a. Current Plans: the department's short and long-term goals and their context

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Department goals: Our primary departmental goal is to be simultaneously an outstanding undergraduate teaching department and a nationally recognized research department, with undergraduate research as the bridge linking the two. Our secondary goals are: to provide the academic core of the Computational Operations Research graduate program; to participate in doctoral supervision through the Applied Science department when appropriate students and resources can be found; to participate in various interdisciplinary programs linked to undergraduate mathematics; and to cooperate with the School of Education in mathematics education programs of various kinds. Our tertiary mission is to hold leadership positions in our various national professional organizations and in on-campus faculty governance activities.

Context and questions for department goals in scholarship

Within the last three years, we have lost and hired one-third of our department's 20 tenure-track faculty. We lost five faculty (two at the full-professor level) to other universities in a six-month period of 2006, and two other senior faculty members retired and were replaced. Several of the faculty who left were well on their way to being departmental stars in scholarship. Because their replacements were at the assistant professor level, replacing our departed colleagues' scholarly stature will take time and must be a departmental priority. We are pleased that several of our new faculty members have already obtained NSF support for their research, and others are active in seeking outside support.

Today the department's principal research groups are a pure mathematics research group focused on matrix analysis and operator theory, plus several applied research groups in biomathematics, computational mathematics, operations research, statistics, and theoretical physics. See Section 6 for further discussion of these scholarly foci. We believe that future appointments should be designed to enhance these scholarly areas rather than strike out in unrelated new directions. For example, maintaining the national standing of the department's matrix and operator analysis group will be a departmental priority. That does not necessarily mean making new appointments in matrix and operator analysis: because of the breadth of interest of members of this group, the group can be strengthened by careful hiring of faculty in related areas such as combinatorics, graph theory, and other parts of algebra and analysis. Although net-new positions for our department seem unlikely in the near future, there will soon be two senior-level retirements and the department will want to use the resulting replacement positions to strengthen its existing scholarly foci listed above. Finding an acceptable internal department chair who would take office in July 2010 will be important if both of these senior retirement positions are to be available for research-based searches.

Context and questions for department goals in teaching

See Section 5.c for a discussion of recent cuts in the department's ability to staff its courses. Those cuts raise questions about finding a new model for our undergraduate mathematics offerings so that we can maintain our current two-course-per-semester teaching assignments while increasing our emphasis on undergraduate research experiences for our students (something that is consistent with the university's QEP accreditation goal). For example, we have already expanded section size in certain general education courses for fall 2008. We must decide other curricular questions as we attempt to balance the needs of our lower- and upper-division programs, given decreased resources. For example, should we move to large sections for our other general education and introductory calculus courses? Should we cut back on our upper division offerings, by canceling some upper division electives (e.g., Math 426, Topology) or by moving others (e.g., Math 408, Advanced Linear Algebra) to an every-other-year format? Should the department reduce the teaching assignment from four to three courses for faculty members who have more than a certain number (say more than three) undergraduate honors students in a given year, and if so, where should the needed money come from?

Part of our staffing problem arises from our aggressive and successful pursuit of NSF funding in the interdisciplinary areas of mathematical biology (an NSF-UBM grant) and computational science (an NSF-CSUMS grant).

These projects require certain curricular commitments from the department, something we could have done relatively easily before the College's 2008 decision to cut the department's staffing. It is true that within the last five years, the College added a net-new position to the department in support of biomathematical activities, and in response the department created four new bio-mathematics courses (Math 131 and 345 in the fall and Math 132 and a Math 410 section in the spring). We have not received any special College support for our CSUMS efforts, and continuing our CSUMS activity will require us to use departmental private funds (which we will do). Nor have we received any long-term support for our teaching in the Freshman Seminar program: each year we ask for adjunct support at the previous year's level, and sometimes we receive it, and sometimes we do not.

Short-range goals in support of our mission:

Maintain our focus on teaching and scholarly excellence (as described in the merit review section of our Personnel Document) in our salary decisions and in future hiring.

Increase the departmental effort devoted to helping pre-tenured faculty members develop their teaching skills and research skills through more mentoring in teaching and through continued private funding of the department's pre-tenure semester-leave program.

Increase our scholarly activity in terms of refereed journal publications, invited presentations at national and international conferences, and competitive outside grant support.

Increase the number of our students involved with REU programs (here or elsewhere) and the number of our honors students, and obtain additional resources to allow more of these students to attend and make presentations at professional meetings.

Continue to cooperate with the College's focus on bio-related and computationally-related projects while maintaining scholarly strength in other existing scholarly foci (see above, and also Section 6), by seeking net-new faculty positions and hiring faculty who support existing scholarly foci, consistent with the needs of the curriculum.

Continue to build a limited number of overlapping research groups within the department. Encourage these groups to involve the department's new faculty members.

Encourage interested faculty to organize and participate in interdisciplinary scholarly activity such as the mathematical physics and the mathematical biology seminars, and if replacement funds exist, release faculty to teach in other departments' graduate programs when they are invited to do so.

Step up our search for grant funding to support doctoral students.

Increase our efforts in organizing scholarly conferences, workshops, etc., that support our academic foci, particularly those that receive outside financial support.

Expand connections with mathematical research groups in other countries.

Expand our program of sabbatical visitors and post-doctoral fellows who want to work with members of our research groups.

Continue nominating our faculty members for appropriate local, state, and national awards.