



## Mathematics and Statistics

A department in the College of Natural Sciences and Mathematics offering the B.A., B.S., M.S. and Ph.D. in Mathematics, and the M.S. in Applied Mathematics.

### ■ The Review Process

This was a standard AQAD review. Reviewers were:

Efraim Armendariz, chair (University of Texas, Austin)

James Carlson (Clay Mathematics Institute)

M. Gregory Forest (University of North Carolina, Chapel Hill)

Alan Gelfand (Duke University)

David Vogan (Massachusetts Institute of Technology)

### ■ Main Issues

Most of the visiting team's comments related to the effects of "dramatic reductions" in the number of faculty in the department, including the "catastrophic" loss of 19 faculty in 2002. The team found that by a "herculean and successful restructuring effort" the department maintained the effectiveness of its teaching programs, but that this came "at the cost of" faculty research, grant development, and mentoring of students and junior faculty.

The team praised the "excellence, energy and maturity" of recently hired junior faculty, but warned that there is a "grave imbalance" across the ranks, with large numbers of senior and junior faculty but few at the mid-level. This imbalance is harmful to mentoring, and it forces junior faculty to carry unusually high service loads that undermine their teaching and research efforts. The team also expressed concern that teaching loads, the tenure clock, and "angst about the future of the department," if not addressed, "will lead to significant losses among this group." Overall, the team found that "the current level of effort of faculty at all levels is not sustainable."

The graduate and undergraduate programs "appear to be flourishing," but reductions in faculty prevent the department from offering "rich special topics courses and undergraduate research experiences." In Statistics, upper division undergraduates must take graduate courses. Advanced topics courses are also lacking at the graduate level.

The team commented on the three main divisions within the department. In core mathematics, the department "has built an amazing research program by attracting excellent junior faculty" whose research interests interlock well with those of senior faculty. In applied mathematics, the team noted that computation is "an emerging common language of science," and urged the department to expand this area (including hiring at the senior level), and to broaden the links of its small and therefore currently "unstable" group area with computational scientists in other disciplines. The team expressed the greatest concern with the statistics group in the department, which it found to be in a "dire situation" having suffered disproportionate faculty losses. The team noted the strong demand for graduates in statistics, and the growing extent to which other disciplines rely on the field. The team urged hiring of a mid- or senior-level faculty member, as well as two hires in the junior ranks, "as soon as possible." Even then, however, the group would still be "too small to satisfactorily cover the whole field," and should focus on developing "critical mass in an area that

meshes with institutional strengths.” In the team’s view, “the most viable option appears to be in the area of biostatistics and bioinformatics,” which both fits with the College’s life sciences thrust and permits strong interaction with the biostatistics faculty in Public Health program.

The team made four “central, overriding” recommendations”

- A net increase in the faculty of “substantial magnitude” (i.e. about fifteen positions).
- Commitment to a public “roadmap” to achieve this level of hiring (e.g., three net hires per year), so as to assist in recruiting and retaining faculty.
- A two-pronged strategy of regular hiring at the junior level and multi-year, open searches at the senior ranks, so as to permit recruitment of senior faculty in the very competitive market.
- Making permanent the department’s recent practice of hiring significant numbers of visiting assisting professors to teach and conduct research. The team suggested these be recast as more prestigious “instructorship” positions, and be given the same reduced 2-1 teaching load as research-active faculty.

#### ■ **Results of the Review**

The department reported that it “was in substantial agreement” with the team’s findings and recommendations, especially the need for substantial growth in the size of the faculty. While the department’s self-study had proposed continuing faculty hiring at the junior level and ramping down the use of visiting assistant professors, they reported being convinced by the counterarguments of the team. The department reported plans to increase upper-level course offerings, and to pursue the team’s recommendations to development an M.S. program in Statistics and to explore a joint Ph.D. program in Biostatistics with Public Health.

The Dean was also in substantial agreement with the team’s recommendations, although reported being “hesitant at present” to indicate a specific target size for the department.