

Précis

Program Performance Review

Mathematics, BA, MA, MS

College of Natural Sciences and Mathematics

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Background

The Department of Mathematics conducted a program performance review during the 2010-11 academic year. The department was granted a postponement of one year due to furloughs. A self-study was completed and Visiting Team of evaluators reviewed the self-study and other documents. Also, the Visiting Team conducted focus group interviews with the Acting Dean, Associate Dean, Department Chair, tenured and tenure track faculty, lecturers, part-time faculty, office staff, undergraduate and graduate mathematics majors and an open session for all department faculty. The Visiting Team was composed of: Mark Ellis, Associate Professor and Chair, Secondary Education, CSU Fullerton; Sean Walker, Associate Professor and Vice Chair, Biological Science, CSU Fullerton; and Peter Williams, Professor and Chair, Mathematics, CSU San Bernardino. The Visiting Team issued a report of its findings which included commendations and recommendations. Also, the Acting Dean provided a summary and recommendations and the Chair of the department responded in writing to the team report. The self-study is noteworthy for its detailed response to the guidelines and its emphasis on analysis of data and planning.

Key Data

The Department of Mathematics has the distinction of being the largest department at the University (FTES) in students served and among the largest in the CSUs. It provides a large number of General Education courses as well as core courses for Engineering, while simultaneously offering a four concentration undergraduate major and two master's level programs. Undergraduate enrollment in FTES was at a high of 1,772 in 2008-09 and has declined to 1,449 in 2009-10. Graduate enrollment has remained constant since the last review in 2003-04 the enrollment was 30 and 2009-10 it was 30 also. There are 29 tenured and tenure track faculty and over 60 full-time and part-time lecturers. The Department reports that its graduation rates over a six year period for freshmen majors were quite low varying from 15.3% to 23.1%. Likewise for transfer students in the major three-year graduation rates also low varying from 9.5% to 33.3%. Because the department is graduating students in numbers larger than these two groups it is concluded that many undergraduates in the major are migrating from other majors. The graduate programs have boasted a high number of applications. In 2009 there were 98 applicants and 63 admitted. A solid majority of the graduate students finish their programs

within 3 years after their enrollment. In fall 1998 there was 70% in three years and fall 2003 68.6% in three years.

Key Issues

As noted the department of Mathematics is a large and complex entity and one key issue deals with faculty growth, stability and development. It is reported that several faculty will retire during the upcoming year. The department needs to develop a hiring plan that considers planned growth and to keep up with its robust course and programmatic demands. Connected to the hiring plan should be a review of the retention, tenure and promotion processes. An issue identified by the Visiting Team is faculty collegiality, civility and communications. The department needs to identify ways to improve interaction amongst faculty to foster a more collegial environment. A new masters program in Statistics (on- line delivery) has been approved at the Chancellor's level how will this modality be incorporated into the department's programmatic offerings? Another issue for consideration of the department is to review its retention efforts to improve graduation rates for undergraduate majors. In outcomes assessment the department needs to develop goals and outcomes, strategies, etc. for the masters program.

Outcomes Assessment

In the critical area of the assessment of student learning and the documentation of student academic achievement, the Department of Mathematics has made notable progress. The faculty have identified seven student learning outcomes "essential" for all majors in the undergraduate program. These outcomes are aligned with curriculum maps for the four concentrations. Importantly, the department has found that the curriculum maps have already helped to identify strengths and weaknesses in the four concentrations. Some rubrics have also been developed as well as an assessment plan for learning outcomes six and seven. The department has conducted considerable review of student performance in the developmental math courses and in the general education math courses as well as post general education courses. The result is long and excellent on analysis but lacking in utilization of findings there is a need to use information i.e. place greater emphases on making changes for improvement. To satisfy learning outcome six *To communicate mathematics effectively both orally and in writing* all majors take Math 380 the History of Mathematics. And while there does not appear to be a culminating learning experience for each of the four concentrations there is for the Teaching Mathematics concentration in the form of capstone course Math 401 and 402. Assessment strategies include embedded questions on final examinations. The department identifies this an indirect measure, but it appears to be a direct measure, students are asked to solve a problem. An indirect strategy is the exit survey the department uses to assess student satisfaction with the program.

While there is much progress in outcomes assessment at the undergraduate level including using information for improvement, not much has been reported for the graduate program including the new MS in Statistics.

The department has also identified quality indicators as evidence of departmental effectiveness. These indicators should be linked to a specific departmental goal, for example the placement of

students in Ph.D. programs, the placement of students in community college positions, etc. See Appendix II Goals and Priorities.

Outlook

The department of Mathematics is an integral and critical component of academics at the University. More and more students partake of its courses and curricular offerings and such demand is expected to continue. The faculty of the department were commended by the Visiting Team for their productivity, teaching performance and numerous awards at both college and national level. The department has been recognized for outstanding teaching and has enjoyed a high level of research supported by extramural funding. Over the last several years more than twelve million dollars has been gathered from statewide and national granting agencies including the National Science Foundation. The Supplemental Instructional Program (SI) (supported by internal and external grants) has provided strong evidence of impacting student achievement in gateway math courses where non- success rates have been high. The department hopes that this program will be institutionalized.

The department has utilized the program performance review process to take stock of its present and look to its future. To that end several *goal clusters* have been identified including: developing new instructional modalities, along with online and hybrid courses; and strengthening undergraduate and graduate programs and the Single Subject Teaching Credential in Mathematics. A present challenge for the department is to replenish the faculty as there are several retirements on the horizon. One plan calls for the hiring of two faculty per year for the next seven years.

For this the largest department there are big challenges ahead and the department appears ready and capable, with dedicated leadership, of tackling those challenges indeed there is evidence that the work has already begun.

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