



Math Department Annual Report For 2002

The mathematics department at New Mexico Tech has a five-fold mission, including service teaching, the undergraduate mathematics major, the graduate program, research, and service. This report summarizes the activities of the department in these five areas during 2002. The report also includes information on trends that have developed over the last several years.

1. Service Teaching.

The majority of students in undergraduate mathematics courses at NMT are students from other majors who are taking mathematics courses required by their major. Because the teaching of these courses is critical to every undergraduate program at NMT, and because the resulting formula funding is the main source of revenue that the math department brings to NMT, this area is of the highest priority to the department.

Student course evaluations continue to show that our faculty are rated very highly by students in mathematics courses. The departmental average teaching evaluation for 2002 was 4.37 on a 5-point scale with 5 being best. All but one of the faculty had individual averages over 4.0.

To ensure that students are actually learning what we want them to learn, the department has been very active in assessment of student learning outcomes. During 2002, the department revised its assessment plan and took steps to strengthen the assessment of freshman calculus by creating a more detailed set of learning objectives for the calculus sequence. As a result of assessment, the department has made several changes, including strengthening the precalculus courses, more carefully enforcing prerequisites, and assigning faculty courses supervisors to all of the precalculus and calculus courses. Beginning in the fall of 2003, the training of new TA's will be greatly expanded. Each TA will receive 3 days of training before they enter the classroom, followed by close supervision during the semester.

Since other departments are actually our clients, the mathematics department has held a series of meetings with representatives from other departments to discuss the content of our service courses.

As a result of these meetings, the mathematics department agreed to a number of changes in course prerequisites that have made it easier for students in other majors to schedule their classes. These changes have been approved by the faculty council for the 2003-2004 catalog.

Serious consideration was given to a proposal from the Electrical Engineering department to squeeze the current three semesters of calculus into one year. However, the majority of representatives from other departments felt that this would be too stressful for the students.

The group also discussed the possibility of an "engineering math" sequence to follow calculus. It was decided that the needs of EE students were very different from those of other students. The EE department and other engineering departments were asked to provide a "wish list" for the content of such sequences of courses. We expect to continue this discussion after we receive responses from the EE and other engineering departments.

The department's teaching load has increased substantially in recent years. In the 2000-2001 academic year, there were a total of 1,665 enrollments in mathematics courses (excluding labs.) The enrollments went up to 1,726 in 2001-2002, and 1,901 in 2002-2003. This represents a 14% increase over three years.

The department has had some trouble in keeping up with the student demand, particularly because we have had several faculty positions open. We have gotten by with the help of part time instructors and faculty

teaching overloads. For next year, we expect to avoid these practices by instead hiring a full time visiting faculty member for the year.

2. The Undergraduate Major

Enrollment in the undergraduate major has been relatively constant with between 50 and 60 majors in each semester from Fall 2001 through Spring 2001. The number of graduates has declined slightly from 17 in May 2000, to 14 in May 2001 and 13 in May 2002. However, this may be a simple random fluctuation. The number of students completing the undergraduate minor in mathematics has grown from 3 in 2000 to 12 students in 2001 and 12 students in 2002.

The 2003-2004 catalog will contain a number of changes to the mathematics major. These are designed to streamline requirements and simplify scheduling of courses for students in the major. One important change is the elimination of the little used "BS in Mathematics with Applied Numerical Analysis Option."

3. The Graduate Program

Enrollment in the MS program went up to 12 student in the fall of 2002 from 9 students in the fall of 2001 and 8 students in the fall of 2000. The department has been graduating 3 MS students per year over the past three years. However, we have already graduated two MS students in the fall of 2002 and expect to graduate 3 or 4 more MS students by May of 2003. Those students who go onto industry have continued to find jobs with starting salaries of \$50K or more. Our two most recent graduates have both been accepted into the Ph.D. program at Clemson University.

The department has proposed a Ph.D. program in "Applied and Industrial Mathematics". This proposal was approved by the department, graduate council, faculty council, and regents. We hope to complete the approval process at the statewide level and begin to recruit students in the fall of 2003.

4. Research

Research activity in the mathematics department has increased greatly in the last few years. Faculty in the department published four refereed journal articles in 2000, five in 2001, and eight in 2002. Several more papers have been accepted for publication and will appear in 2003. We expect that the number of publications will continue to grow as we hire new tenure track faculty.

Faculty involvement in externally funded research has also expanded. Aitbayev, Avramidi, Borchers, Kerr, and Schaffer have received external funding in the past year. Aitbayev is buying out of two courses per year to work on the DETOSS project. Avramidi was awarded a number of travel grants. Borchers and Jan Hendrickx were awarded a \$319,000 grant by the Army Research Office for their research in land mine detection. Kerr was awarded a summer research contract by Sandia National Labs. Schaffer is buying out of courses to work for iCASA. We expect that this level of activity will continue to increase as we hire new tenure track faculty.

5. Service

Faculty in the mathematics department have been involved in service to the department, the institute, and the profession. At the institutional level faculty have been members of many search committees, tenure committees, senate committees and faculty council committees. Professor Borchers was chair of the faculty council for 2002-2003. Math faculty have also been active at the professional level, as journal referees, NSF reviewers, and officers in professional societies. Stone was chair of the Southwestern section of the MAA. Borchers was a member of the board of the INFORMS Computer Society. In the spring of 2003, the math department will host the annual meeting of the Southwestern section of the MAA.