

Program name:

Department of Mathematical Sciences

Report prepared by:

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Who is the current Assessment contact for your department?

Yu Song, Chair

Should assessment information be sent to anyone else in your department?

No

1. What specific educational goals does your program have for its students?

The major goal of our program is to give students seeking degrees in mathematics a broad understanding of the field of mathematics.

- Students should have the ability to read and understand technical mathematical writing, including proofs, in such areas as algebra and analysis.
- Students should have the ability to communicate mathematical ideas, both in written and verbal form, to others.
- Students should be able to model complex problem situations in equivalent mathematical form and, once a solution is found, be able to translate the solution into the original problem context.
- Students should be able to use appropriate technology to explore and solve mathematical problems.
- Students should be able to apply mathematical knowledge in non-academic contexts.

2. What assessment techniques did your program use to measure the attainment of these goals in the last academic year? (e.g. pre and post testing, portfolios, juried performances, etc.) What were the results of these assessment measures?

The Department of Mathematical Sciences uses several methods to assess students of mathematics. A major instrument of assessment is the use of student portfolios, containing representative work from all 400 level Mathematics courses taken by a student. Depending on the desires of the instructor, the representative work may include such items as final examinations, homework assignments, projects, papers, etc. Student research projects are also included in their portfolios.

Two surveys are also chief instruments of assessment. Every third year, a

survey is taken of current students majoring in mathematics or secondary mathematics education; the last such survey was done in Fall 2001. A survey of alumni is also taken every third year; the last such survey was done in Fall 2002. Thus neither survey was scheduled to be administered during the 2003-2004 academic year.

Other components of our assessment plan include records of student applications to graduate schools, and student performances on the Putnam and other competitive examinations.

3. How did these techniques help the department measure student learning and achievement? Please be explicit about how data collected objectively measure student outcomes. How does the data measure whether students understand the important concepts of a discipline?

Samples of students' solutions to homework assignments, final examinations, research projects and other written material can be used to measure the students' ability to read and understand technical mathematical writing, including proofs, in such areas as algebra and analysis. Such written documentation also can be used to assess the ability to communicate mathematical ideas in written form. Appropriately designed assignments, projects or examination problems measure the ability to model complex problem situations in equivalent mathematical form and the ability to translate the solution into the original problem context. Similarly, such assignments, projects or examination problems can be used to determine whether the students are able to use appropriate technology to explore and solve mathematical problems. Work related to mathematical modeling can be used to measure the students' ability to apply mathematical knowledge in non-academic contexts.

4. For which goals did your students learn at or beyond your expectations? Which areas need improvement?

The students' ability to read and understand some technical mathematical writing, and to communicate some mathematical ideas, both in written and verbal form, to others was found to be satisfactory. However, it was determined that their ability to read and understand proofs could be improved. The students' ability to model complex problem situations in equivalent mathematical form and, once a solution is found, their ability to translate the solution into the original problem context met our expectations. The ability of the students to use appropriate technology to explore and solve mathematical problems and to apply mathematical knowledge in non-academic contexts met our expectations.

5. How were the results of your assessment program analyzed and recorded?**a. How was department faculty involved?**

Those faculty members teaching 400-level courses added to the student portfolios such materials as final examinations, homework assignments, projects, papers, and research projects.

b. How were students involved?

This year the students were involved in the assessment process only insofar as materials from their 400-level courses were collected and placed in their portfolios. Not student surveys were scheduled to be administered during the 2003-2004 academic year.

c. How were records kept?

The student portfolios are kept in the department office, NS301, and are maintained by the department secretary.

6. The Higher Learning Commission points out the obvious but important concept that Assessment cannot be static. In order to achieve excellence, assessment must be viewed with a constancy of purpose requiring never ending activity and revision.

-Were any changes made this year in the assessment plan or the assessment techniques used by your department?

-How does your assessment plan tie into your department's strategic planning?

-How were these decisions made?

No changes to the assessment plan were made during the 2003-2004 academic year as of the date of this report.

The activities described in the department's assessment plan give the department valuable feedback from our students in the form of student surveys and materials gathered from upper-level courses. The department uses this information when reviewing its programs and curriculum.

The department meets annually to discuss the information gathered through assessment activities. At this meeting the department considers changes to its programs and curriculum and other issues raised by the assessment data.

7. The Higher Learning Commission emphasizes that assessment must be used to improve academic operations and to achieve measurable improvements in student learning outcomes.

-Were any changes made to your curriculum as a result of assessing your students?

-Do you anticipate making any program changes in the future as a result of your assessment activities?

-What is the rationale for these changes?

-How are your assessment results tied to your budget or budget requests?

The department considered the need for improving the students' ability to read and understand proofs, and decided to increase the coverage of proof techniques in M347, Discrete Mathematics. The department continues to review and improve its programs. The assessment activities form part of the review process, have been used in the past, and will continue to be used in the future to guide our program modification and development.