

## ASSESSMENT ACTIVITY FORM

**Department/Program:** Mathematics / MS in Applied Mathematics  
**Date:** 5 June 2002

**Chair:** P.W. Eloe

| OUTCOMES/MEASURES UTILIZED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RESULTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <p><b>Outcome One ! The student, as an applied mathematician, will be able to support formal mathematical developments with rigorous arguments.</b></p> <p><b>Measures Utilized</b></p> <p><b>Measure 1</b> 90% of the students will have completed MTH 430 with a B or better or will have satisfied this requirement upon entering the program.</p> <p><b>Measure 2</b> 90% of the students will have completed MTH 565 with a B or better.</p> <p><b>Measure 3</b> 80% of the students will demonstrate formal mathematical developments with rigorous arguments through exhibits in their portfolios.</p>                                                                                                                     | <p>67% (2/3) of the graduating students completed MTH 430 with a B or better or will have satisfied this requirement upon entering the program.</p> <p>67% (2/3) of the graduating students completed MTH 565 with a B or better.</p> <p>100% (3/3) of the graduating students demonstrated formal mathematical developments with rigorous arguments through exhibits in their portfolios. Through an oversight, we did not request portfolio exhibits from one part-time student.</p>                                                           |
| <p><b>Outcome Two ! The student will develop proficiency in the construction and refinement of a mathematical model.</b></p> <p><b>Measures Utilized</b></p> <p><b>Measure 1</b> 90% of the students will complete 4 courses not offered by the Department of Mathematics with a B or better.</p> <p><b>Measure 2</b> Each student will complete MTH 541, Mathematics Clinic.</p> <p><b>Measure 3</b> 80% of the students will exhibit acceptable proficiency in the construction and refinement of a mathematical model through evaluation of the Mathematics Clinic report.</p> <p><b>Measure 4</b> 90% of the students will complete with a B or better, MTH 547 and MTH 543, MTH 551 and MTH 552, or MTH 531 and MTH 535.</p> | <p>33% (1/3) of the graduating students completed 4 courses not offered by the Department of Mathematics with a B or better.</p> <p>Each graduating student completed MTH 541, Mathematics Clinic.</p> <p>100% (3/3) of the graduating students exhibited acceptable proficiency in the construction and refinement of a mathematical model through evaluation of the Mathematics Clinic report.</p> <p>67% (2/3) of the graduating students completed with a B or better, MTH 547 and MTH 543, MTH 551 and MTH 552, or MTH 531 and MTH 535.</p> |
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| <p><b>Outcome Three ! The student will develop proficiency in using symbolic language, numerical and statistical software packages and word processing packages.</b><br/> <b>Measure Utilized</b></p> <p><b>Measure 1</b> 90% of the students employed as teaching assistants will efficiently employ a symbolic language package.</p> <p><b>Measure 2</b> 90% of the students who complete MTH 531 or 552 with a B or better will correctly employ a symbolic language package.</p> <p><b>Measure 3</b> 90% of the students who complete MTH 543 or 547 with a B or better will correctly employ a statistical software package.</p> <p><b>Measure 4</b> 80% of the students who complete MTH 555 or 556 with a B or better will code correctly in a programming language.</p> <p><b>Measure 5</b> 90% of the students will exhibit computer literacy through exhibits in their portfolios.</p> | <p>100% of the graduating students employed as teaching assistants (3/3) efficiently employed a symbolic language package.</p> <p>67% (2/2) graduating students completed MTH 531 or 552.</p> <p>100% (2/2) of the graduating students who completed MTH 543 or 547 with a B or better correctly employed a statistical software package.</p> <p>100% (2/3) of the graduating students who completed MTH 555 or 556 with a B or better code correctly in a programming language.</p> <p>100% (3/3) of the graduating students exhibit computer literacy through exhibits in their portfolios.</p> |
| <p><b>Outcome Four ! The student will develop the ability to communicate technical ideas orally and in writing.</b><br/> <b>Measure Utilized</b></p> <p><b>Measure 1</b> Each student will present results from the Mathematics Clinic project to the faculty in a colloquium. 90% of the projects will be deemed satisfactory.</p> <p><b>Measure 2</b> 50% of the students who accumulate 6 credit hours of MTH 541 will present their Mathematics Clinic results at a professional meeting.</p> <p><b>Measure 3</b> Each student will present results from the Mathematics Clinic project to the faculty in a technical report. 90% of the projects will be deemed satisfactory.</p> <p><b>Measure 4</b> 80% of the students who accumulate 6 credit hours of MTH 541 will submit their results for publication.</p>                                                                           | <p>100% (3/3) of the projects for the graduating students were deemed satisfactory.</p> <p>33% (1/3) presented a paper at a professional meeting.</p> <p>100% (3/3) of the reports for the graduating students were deemed satisfactory.</p> <p>67%(2/3) of the reports for students who accumulate 6 credit hours of MTH 541 submitted results for publication.</p>                                                                                                                                                                                                                              |

**Brief Analysis: All three of this year's MS graduates are pursuing advanced degrees in Ph.D. programs. One is in a Ph.D. program in mathematics at the University of North Carolina, one is in a Ph.D. program in mathematics at Southern Illinois University and one is in a Ph.D. program in statistics at Rice University. This says several interesting things. First, this is not what the program is about. We mean to prepare people for**

the job market with a professional type master degree. We do not mean to prepare people for advanced study in mathematics. Second, we do run a modest program and yet North Carolina and Rice are good Ph.D. programs. This supports an opinion that traditional Ph.D. programs in mathematics are currently in trouble with respect to recruitment

**Actions Taken:**

The outcomes for the MS program in applied mathematics are acceptable but the measures are not well constructed. The Mathematics Clinic provides a fine portfolio type assessment tool. The MS program is designed to equip students to compete with engineers and computer scientists on the job market and so has a professional program mentality to it. The Clinic project encompasses the rigor, the computation, the modeling, the communication and the writing aspects all in one project. (An analogous project for the undergraduate program is inappropriate. There is too much core mathematics that must be learned at that level.) The selection of a variety of courses to measure outcomes does not work. Over time, more doors have closed to students taking courses out of discipline. Our students find out of department coursework only in Engineering Management these days.

**Resources Utilized:**

Annual update of portfolio exhibits: 10 hours faculty time.

Annual data collection, update of electronic worksheet and analysis: 10 hours faculty time.

File: assess.act

WordPerfect 6.0 format