

## Master of Science -- Computational and Applied Mathematics

### *Expanded Statement of Institutional Purpose*

#### **Institutional Mission Reference**

The Computational and Applied Mathematics M.S. Program offers graduate students a high quality, elective-rich program that meets national standards of excellence with three options: (1) Applied Mathematics, (2) Biostatistics, and (3) Statistics. Program faculty are committed to quality teaching, and 85% of the faculty are active researchers, providing students with a window on the discovery of new mathematics. The Computational and Applied Mathematics M.S. Program supports the University's mission of providing advanced professional education for the Hampton Roads area and the Commonwealth.

#### **Institutional Goal(s) Supported**

The Computational and Applied Mathematics M.S. Program supports the University goals of (a) quality graduate academic programs, (b) quality teaching, (c) discovery of new knowledge, (d) community service through the training of a professional technical workforce. (See pages 3-4 of the Old Dominion University Catalog or pages 8-9 of the Strategic Plan.) The Computational and Applied Mathematics M.S. Program also supports Strategic Initiative 2 (Excellent Graduate Programs), Strategic Initiative 4 (Programs of National Prominence) through its involvement in Computational Sciences & Engineering, and Strategic Initiative 10 (Regional Cooperative Relationships) through the involvement of its M.S. candidates with local scientific and health research institutions. (See the Old Dominion University Strategic Plan, pages 35, 44, and 82.)

### *Intended (Student) Outcomes, Methods for Assessment, and Criteria for Success*

#### **Intended Outcome 1**

Students will demonstrate competence in the major analytical skill areas of mathematics.

**Method for Assessing Outcome 1 and Criterion for Success:** All students graduating with the M.S. with a concentration in Applied Mathematics will take the same written qualifying examination annually created and administered by the research faculty for the Ph.D. students, and pass at the M.S. level on the first or second attempt.

**Summary of Assessment Data Collected for Outcome 1:** There were 7 Applied Math MS graduates in 2002-2003. They all passed the Applied Math qualifying examination at the MS level on their first attempt.

**Alternate Method for Assessing Outcome 1 and Criterion for Success:** All students graduating with the M.S. with a concentration in Statistics or Biostatistics will take the same written qualifying examination annually created and administered by the research faculty for the Ph.D. students, and pass at the M.S. level on the first or second attempt.

**Summary of Assessment Data Collected, Alternate Method for Outcome 1:** There were 2 Statistics MS graduates in 2002-2003. They both passed the Statistics qualifying examination at the MS level on their first attempt.

#### **Intended Outcome 2**

Students will demonstrate proficiency in using word-processing software to prepare technical papers and presentations, including typesetting equations.

**Method for Assessing Outcome 2 and Criterion for Success:** All students graduating with the M.S. concentration in Applied Mathematics will prepare a written report on their research summary (see below).

**Summary of Assessment Data Collected for Outcome 2:** The 7 applied Math MS graduates each prepared

a written report on a literature survey they were required to conduct for successful completion of Math 621.

**Alternate Method for Assessing Outcome 2 and Criterion for Success:** All students graduating with the M.S. concentration in Statistics or Biostatistics will prepare a written report on their research project (see below).

**Summary of Assessment Data Collected, Alternate Method for Outcome 2:** The 2 Statistics MS graduates both prepared a written report on their research project, STAT 632, which was a requirement for the degree.

### **Intended Outcome 3**

Students will demonstrate depth of knowledge in at least one area of contemporary mathematics and statistics.

**Method for Assessing Outcome 3 and Criterion for Success:** All students graduating with the M.S. concentration in Applied Mathematics will complete a research summary and literature survey that extends some topic of their choice in their graduate coursework beyond the scope of the course.

**Summary of Assessment Data Collected for Outcome 3:** The 7 Applied Math MS graduates each completed a literature survey as one of the requirements of Math 621.

**Alternate Method for Assessing Outcome 3 and Criterion for Success:** All students graduating with the M.S. concentration in Statistics or Biostatistics will complete a modeling project, developing or adapting an existing statistical method to analyze data arising from a scientific setting, and provide a literature survey.

**Summary of Assessment Data Collected, Alternate Method for Outcome 3:** The 2 Statistics MS graduates both completed a modeling project, STAT 632, which was a requirement for the degree.

### **Intended Outcome 4**

Students will develop an appreciation for the breadth of contemporary research in applied mathematics and statistics.

**Method for Assessing Outcome 4 and Criterion for Success:** All students, prior to graduation, will attend and succinctly summarize and evaluate in writing at least eight (8) professional seminars given by research faculty or external seminar visitors.

**Summary of Assessment Data Collected for Outcome 4:** Because of the severe budget cuts, we were unable to bring in external seminar visitors. As a result the departmental colloquium was suspended for the year.

### **Intended Outcome 5**

Students will give clear and effective oral presentations.

**Method for Assessing Outcome 5 and Criterion for Success:** All students, prior to graduation, will give at least one formal technical presentation to peers and faculty judges and obtain at least a Satisfactory rating from the faculty, and at least 75% will earn scores of Good or Excellent.

**Summary of Assessment Data Collected for Outcome 5:** The 7 Applied Math MS graduates each made a short presentation in required course Math 693. The 2 Statistics MS graduates both defended their findings in their modeling project, STAT 632.