Doctor of Philosophy -- Computational and Applied Mathematics

Expanded Statement of Institutional Purpose

Institutional Mission Reference

The Computational and Applied Mathematics Ph.D. Program offers graduate students a high quality, elective-rich program that meets national standards of excellence with two options: (1) Applied Mathematics and (2) Statistics/Biostatistics. 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 Ph.D. Program supports the University's mission of providing advanced professional education for the Hampton Roads area and the Commonwealth.

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Institutional Goal(s) Supported

The Computational and Applied Mathematics Ph.D. Program supports the University goals of (a) quality graduate academic programs, (b) quality teaching, (c) discovery of new knowledge, (d) community service. (See pages 3-4 of the Old Dominion University Catalog or pages 8-9 of the Strategic Plan.) The Computational and Applied Mathematics Ph.D. Program also supports Strategic Initiative 2 (Excellent Graduate Programs), Strategic Initiative 4 (Programs of National Prominence) through its involvement in Computational Sciences & Engineering, Strategic Initiative 6 (Premier International University) through its cooperative arrangements to host doctoral candidates supported on fellowships from other governments, and Strategic Initiative 10 (Regional Cooperative Relationships) through the involvement of its Ph.D. candidates with local scientific and health research institutions. (See the Old Dominion University Strategic Plan, pages 35, 44, 58, 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 Ph.D. with a concentration in Applied Mathematics will pass a written qualifying examination created and administered by the research faculty in applied mathematics, and at least 50% of students will pass on their first attempt.

Summary of Assessment Data Collected for Outcome 1: There was 1 Applied Math PhD graduate, Alvaro Islas, in 2002-2003. He passed the qualifying exam on his first attempt..

Alternate Method for Assessing Outcome 1 and Criterion for Success: All students graduating with the Ph.D. with a concentration in Statistics/Biostatistics will pass a written qualifying examination created and administered by the research faculty in statistics and at least 50% of the students will pass on their first attempt.

Summary of Assessment Data Collected, Alternate Method, for Outcome 1: There was 1 Statistics PhD graduate, Brian Reck, in 2002-2003. He also passed his qualifying exam on the first attempt..

Intended Outcome 2

Students will demonstrate proficiency in using mathematical software to solve problems on computers and word-processing software to prepare technical papers and presentations, including

typesetting equations.

Method for Assessing Outcome 2 and Criterion for Success: All students will prepare a word-processed doctoral dissertation that meets all of the standards of the Dean of the College of Sciences. In addition, all students will either teach in undergraduate computer calculus, numerical analysis, or statistics laboratories that require them to master some type of mathematical software (symbolic, numerical, or graphical) or they will independently satisfy the Graduate Program Director through some aspect of their research, coursework, or independent study, that they have obtained sufficient proficiency that they can teach others how to use such software.

Summary of Assessment Data Collected for Outcome 2: The 2 PhD graduates each prepared a word-processed dissertation. Dr. Islas taught in our computer calculus sequence and Dr. Reck taught sections of freshman statistics which introduce students to assignments in statistical laboratories.

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 will successfully defend a doctoral dissertation before a committee that includes at least one external examiner, and at least 75% of students will have at least one archival publication in press at the time of their defense.

Summary of Assessment Data Collected for Outcome 3: Both PhD graduates successfully defended their doctoral dissertations before their respective committees. Both students had archival publications already in print when they defended.

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 (on standard feedback forms provided and filed by the Graduate Program Director) at least sixteen (16) 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 their

formal defense, 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 ratings of Good or Excellent.
Summary of Assessment Data Collected for Outcome 5: Both PhD students gave pre-defense lectures to their examining committees and received advice and input on their work in preparation for their formal dissertation defenses.