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Department of Mathematics and Statistics
Assessment Report
For the
M.S., M.A.T and Ph.D. in Mathematics
Fall 2005 - Spring 2006

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Introduction

The Department of Mathematics and Statistics (DMS) has collected information approximately as directed by the department's Student Learning Outcomes Assessment Plan (Appendix 1). This includes comparison to other institutions, a summary of comprehensive exam results and tracking our students after they graduate.

Assessment Facts and Analysis

I. COMPARISON TO OTHER INSTITUTIONS

We examined the graduate programs in mathematics at the University of Wyoming, the University of North Dakota and the University of Idaho. These are all research universities in states of roughly comparable size. While the size of the graduate programs varies considerably, the number of math faculty in each department was pretty consistent and averages just over twice the size of the UAF DMS math faculty. MS degree requirements were generally similar or less than those at UAF DMS. PhD requirements (for UW and UI; note UND does not have a PhD) are stronger. Graduate student stipends were comparable to the DMS stipend of $12,000 plus a tuition waver.

University of Wyoming. The math department at UW offers an M.A., M.S., M.A.T., and a Ph.D. in mathematics. Their department is a mathematics-only department (as opposed to DMS which includes statistics) and has 20 professorial rank math faculty and about 10 lecturers and instructors. Thus the faculty is much more than twice as large as UAF DMS. They currently list 25 graduate students in mathematics. Their website lists four PhD graduates and eight MS graduates from 2005 and 2006. Thus they produce at a much higher rate than UAF DMS.

Most first year students teach(e) 4 o1s 0 0 0 sTr (e) 4 4 (a) 4 0 0.24 �θ 360husr -7 (a) 4 0 -7 ( ) -10 (a) 4

UW's Ph.D. program is much more developed than the DMS program. Here is a description of the PhD requirements: "Students must pass a qualifying examination at the Ph.D. level, show proficiency in one foreign language, and pass a preliminary examination. In addition, candidates for the Ph.D. must complete at least 42 hours of courses numbered 5000 or above. Beyond the seven specific courses required for the master's degree, all programs in pure mathematics must include the following three selections: MATH 5605 ; either 5570 or 5555; and either (a) MATH 5270 or (b) an additional applied mathematics course, chosen from MATH 5310, 5340, 5345 and 5440. Programs of students specializing in an area of applied mathematics must include, beyond the seven specific courses required for the master's degree, the following four selections: MATH 5340, 5345, either MATH 5270 or 5275 and either MATH 5310 or 5320. Applied mathematics students …"

New exams are created for each round of comprehensive exams. Typically the faculty member who taught the course writes the exam, but a second faculty member reviews the exam before it is given to the students. If the student exam is not one of the core subjects, the student must solicit and receive a commitment from the relevant instructor to create and grade. Copies of old exams are made available to students.

Two faculty members grade each exam. The results are then reviewed by the examination committee. Students must pass all three exams in order to have passed the comprehensive examination. If a student passes two of the three exams but fails a third, then the student must retake (with a new test) the failed subject in a timely manner, usually within one month of the first attempt. If the student then passes this exam, he/she is considered to have passed the comprehensive exam. If the student fails the retake, or fails two or more exams on the initial attempt, then the student is considered to have failed the comprehensive exam. The student must then wait at least one semester before attempting the complete suite of three comprehensive exams.

These comprehensive exams are required of all Ph.D. students but are not sufficient to complete the examination requirements for the doctoral degree. Further examinations, presumably oral, in the area of the dissertation are expected and are the responsibility of the student's committee. The department is in the process of reviving the Ph.D. program, and while we have several Ph.D. students none has yet passed the preliminary exam.

Appendix II shows results for the Spring 2005 and Fall 2006 comprehensive exam process.

III. SUMMARY OF RECENTLY GRADUATED STUDENTS.

Below is a complete list of graduate students in our department who have graduated since 2002; there were no graduates in 2003 or 2004 but there were two in 2005 and . The list, which is in reverse chronological order, includes their name, thesis/project title, date of graduation.

Victor Mikhailov, Project: (title?) M.S December 2006, Advisor – Sergei Avdonin

Jacob Stroh, Thesis: Non-normality in scalar delay differential equations M.S December 2006, Advisor – Ed Bueler

Valeri Groshev, Project: (title?) M.S. August 2006, Advisor – Sergei Avdonin

Jed Brown, Project: Multi-modal ice sheet dynamics: theory and implementation, M.S. August 2006, Advisor – Ed Bueler [in PhD Geophysics program, ETH, Switzerland]

Robert Luz, Thesis: (title?) , M.S. August 2006, Advisor – John Rhodes

Anna Bulanova, Project: (title?) M.S. May 2006, Advisor – Sergei Avdonin

Tim Carlson, Thesis: Magnus' Expansion as an Approximation Tool for ODEs, M.S. May

APPENDIX 1

Department of Mathematics and Statistics
Student Learning Outcomes Assessment Plan
for the M.S., M.A.T, and Ph.D. degrees

Date: February 2004

Certificate or Degree Program: Master of Science, Master of Arts in Teaching, and Doctor of Philosophy

Mission: We shall provide quality education responsive to the needs of individual students and the diverse population of Alaska.

Goal: To assure that our graduates are adequately prepared to succeed in the job market in mathematics or a closely related field.

INTENDED
OUTCOMES/
OBJECTIVES

APPENDIX 2 Comprehensive exam results

Spring 2006 MS Comprehensive (and PhD Qualifying) Exams: Takers and Results

STUDENT	real an. Mon. 3/20	topology Tues. 3/21	complex an. Wed. 3/22	algebra Thurs 3/23	math phys Thurs 3/23	PDE Thurs 3/23
Valeriy Groshev (MS)	X P		X F P2		X P	
Elchin Jafarov (PhD)	X F	X F			X F	
Jed Kallen-Brown (MS)	X P	X P	X F P2			
Amy Keith (MAT)		X F				
Robert Luz (MS)	X P	X P		X P		
Victor Mikhailov (PhD)	X P		X F P2			X P