Institutional Effectiveness Report
Academic Year 2010-11
Department of Mathematics

Mathematics Program Report

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Program Mission and Goals

- A primary purpose of the Department of Mathematics at Francis Marion University is to offer all University students a varied and well-balanced curriculum of undergraduate education in mathematics. In the liberal-arts tradition, the courses in the curriculum teach students to think logically, to analyze problems and solve them appropriately, and to communicate their ideas clearly.

- The Department also provides a broad range of entry-level courses in order to meet the needs of students with widely varying mathematical backgrounds and provide them with skills appropriate for their selected majors.

- Equally important, the curriculum provided by the Department leads to baccalaureate degrees in two distinct but overlapping areas: mathematical sciences and teacher certification in mathematics. These courses prepare students for careers in education, business, industry, and government. They also prepare those students of sufficient interest and ability for further study of mathematics at the graduate level.

- The Department also offers graduate courses in support of the post-baccalaureate program in teacher re-certification.

- The Department provides experiential learning activities for its majors such as travel to local, regional, and national conferences, field trips to local industries, student research and internships, competition in national modeling contests, and employment in labs and recitations. These experiences expand upon the concepts learned in the classroom and add practice and observation components to complete the learning cycle. Participation in these activities better prepares students for careers after graduation.

- To maintain the vitality of the Department and enhance the University's teaching mission, members of the Department undertake new course development, conduct research in discipline or related area, or pursue other avenues of faculty development.

- The Department serves the regional community by hosting the annual Pee Dee Regional High School Mathematics Contest and the annual Advanced Placement Calculus Practice Exam. The Department serves the mathematics community by hosting the annual Francis Marion Undergraduate Mathematics Conference and by judging the national High School Mathematical Competition in Modeling (HiMCM). The Department faculty members also participate in various workshops, science colloquiums, science fairs, and other programs that enrich the educational and cultural experiences of the region.

Assessment Activities

The Department of Mathematics uses several assessment tools, such as an internal Exit Exam, an internal Senior Survey, the University student and course evaluations, and the external Praxis II mathematics test. Faculty service and scholarship are assessed using faculty annual reports.

Assessment	2006-07	2007-08	2008-09	2009-10	2010-11
Mean Exit Exam score on required portion[1]	Not administered	Administered but not graded in Spring 2008	62	34	72
Percentage of graduating students known to be accepted to Graduate School or offered Position in Teaching, Business, Industry, or Gov't[2]	Not requested	50.0%	62.5%	50.0%	0.0%*
Happiness in majoring in mathematics[3,8]	1.09	1.25	1.36	1.3	1.7
Helpfulness in mathematics courses[3,8]	1.64	1.5	1.55	1.7	1.7
Effectiveness on mathematics instructors[3,8]	1.55	1.5	1.73	1.6	1.7
Quality of the mathematics program[8]	1.914^4	1.604^4	1.915^5	1.705^5	2.3^5
Quality of instruction[6]	1.89	1.89	1.79	1.55	1.91
Availability of instructor outside the classroom[7]	1.5	1.51	1.52	1.37	1.66
Overall quality of course as a learning experience[6]	1.91	1.89	1.79	1.58	1.94
Percentage of students who passed the Praxis II Math Content Knowledge score[8]	100	100	100	100	100
Percentage of students who passed the Praxis II Math Proofs and Models score[8]	100	100	100	100	100

Number of scholarly activities by math faculty[8]	19	40	24	28	22
Mean number of experiential learning activities while at FMU for each Math 499 student	Not requested	Not requested	4.0	1.9	2.0

1. Exit Exams scores are out of 100 points and were introduced in Spring 2008, but scores have not been recorded until Fall 2008.
2. Percentage success as stated during Exit Interview which began in Spring 2008.
3. Data recorded from Senior Survey based upon a four point scale (1-strongly agree, 2-agree, 3-disagree, 4-strongly disagree).
4. Data recorded from Senior Survey based upon a five point scale (1-excellent, 2-good, 3-adequate, 4-fair, 5-poor). See Appendix for Senior Survey data.
5. Data recorded from Senior Survey based upon a revised four point scale (1-excellent, 2-good, 3-fair, 4-poor). See Appendix for Senior Surveys.
6. Data recorded on University Course and Instructor Evaluations in 300-level and 400-level math courses (1-excellent, 2-good, 3-fair, 4-poor, 5-cannot rate).
7. Data as recorded on University Course and Instructor Evaluations in 300-level and 400-level math courses (1-very satisfied, 2-satisfied 3-dissatisfied, 4-very dissatisfied).
8. See Appendix for data.

* Of the three students completing the Senior Survey, one student is completing his student teaching in the fall. We are very confident that he will be offered a teaching position when he graduates in December which will result in a change from 0.0% to 33.3%.

Issues of Concern 2010-11	Actions Taken
Number of mathematics majors	Establishment of the Allen Mathematics Scholarship awarded to an outstanding mathematics major.
Success of students in calculus courses	Proposal approved for lab section of Calculus I (Math 201L) to be offered in Fall 2010. QEP grant awarded to provide Calculus Recitations to students enrolled in any calculus course.
Informal interaction of majors	Creation of a Math Study Hall in Department for sole use of mathematics majors which includes computers with mathematical software. **ISSUE OF CONCERN RESOLVED**
Use of technology in courses	Implementation of new mathematics computing course, Math 222 (Problem Solving in the Sciences using Software) to be offered in Spring 2010.
Number of women and minorities in math and sciences	Hired Dr. Sharon O'Kelley as Assistant Professor of Mathematics.

Appendices

Summary of Selected Student Responses from Mathematics Senior Survey 2010-2011
Three students responding.

#	Question					
2	I am glad that I majored in mathematics.	*strongly disagree*	*disagree*	*agree*	*strongly agree*	
				2	1	
3	I feel the overall quality of the library resources in mathematics are:	*poor*	*fair*	*good*	*excellent*	
		1		2		
4	I would rate use of technology (graphing calculators or computers) with the Mathematics Program as:	*poor*	*fair*	*good*	*excellent*	
			1	1	1	
5	The projects/homework assignments in my courses were beneficial in helping me gain knowledge of the material presented in class.	*strongly disagree*	*disagree*	*agree*	*strongly agree*	
		1		1	1	
6	The quantity (number) of projects/homework assignments in your mathematics courses in terms of how many you feel were necessary for you to learn the material was on the average:	*far too few*	*slightly too few*	*about right*	*slightly too many*	*far too many*
				3		
7	The variety and complexity of the projects/homework assignments in your mathematics courses in terms of how much you feel was necessary for you to learn the material were on the average:	*far too simple*	*slightly too simple*	*about right*	*slightly too complex*	*far too complex*
				2	1	

#	Question	Responses
8	I found these mathematics courses to be most profitable:	Plane Geometry, Abstract Algebra, Intro to Higher Math
		Calculus II, Linear Algebra
		Discrete Math, Linear Algebra
9	I found these mathematics courses to be least profitable:	Discrete Math
		---

10	List any courses/subject areas in mathematics you feel you should have had but were not offered.	A computer Modeling Course; Math 222

#	Question					
11	Overall, I feel the requirements in the courses in my major were:	*far too severe*	*somewhat severe*	*adequately demanding*	*somewhat easy*	*far too easy*
				2	1	
12	Overall, the mathematics courses I took were profitable.	*strongly disagree*	*disagree*	*agree*	*strongly agree*	
				2	1	
13	Overall, the mathematics instructors I had were effective.	*strongly disagree*	*disagree*	*agree*	*strongly agree*	
				2	1	

14	I was advised effectively by the mathematics faculty.	strongly disagree	disagree	agree	strongly agree
				1	1

15	I found these mathematics instructors to be most effective:	Dr Whitmire, Dr. Schnibben, Dr. Scott
		Dr. Ramey, Dr. West
		Dr. Ramey, Dr. Schnibben

16	a) I had these problems with the operation of the Mathematics Program:	Scheduling problems with educational courses; Individual instructors (teaching styles)
		None
		None

17	The problems I experienced were handled effectively by the mathematics faculty.	strongly disagree	disagree	agree	strongly agree
				3	

18	What do you consider to be strong points, if any, of the program in mathematics at FMU?	A handful of instructors who really care weather or not a student understands the material.
		Smaller class sizes; Teachers helpful in and out of class.

19	What do you consider to be weak points, if any, of the program in mathematics at FMU?	A handful of instructors who don't seem to care weather or not students understand the material.
		Getting the student the knowledge of what can be done with the major.
		Inconsistency among the professors on math notation. Nothing to breaking.

20	What would you suggest for correcting any weaknesses (listed in 19) or improving the strong points (listed in 18)?	Replace apathetic professors with motivated new instructors who aren't afraid of new technology.

		Standardization

21	I would like to see these changes made in the Mathematics Program:	Using more technology in class
		More chances to see applications in Math

22	I would rate the overall quality of the Mathematics	poor	fair	good	excellent

	Program at Francis Marion as:		1	1		
23	Which person(s), if any, at FMU do you feel contributed the most to your education and why?	Dr. Whitemire and Dr. Schnibben because they put a very noticeable effort into making some students have a position learning experience.				
		Dr. Ramey, first math professor whose class did not allow slacking off.				
		Ramey taught most of my classes and influenced me to take the math major.				
24	What are your immediate plans after graduation?	Teaching				
		Looking for a job in upstate SC				
		Don't know				
25	Have you been accepted to a Graduate School or offered positions in Teaching, Business, Industry or Gov't?	No.				
		No.				
		No.				
26	Are your immediate plans related to your major? Explain.	Yes, I plan to be a HS teacher				
		Yes and No. I will look for a job in both my majors (math and biology). If I can't find one then one in biology.				

27	Do you feel that your undergraduate degree has adequately prepared you for your first job and/or graduate school? If not, in what areas do you feel your background was inadequate?	Yes				
		Yes				
		My plans involve my CS degree primarily				

Praxis II Mathematics Exam Scores
March 2009 through March 2010

3-13-10

    Mallory Proctor
    0061 Math Content Knowledge
    Score   135   Passed State Score   131
    0063 Math Proofs
    Score 154   Passed State Score   137

9-18-10

    Abby Sullivan
    0061 Math Content Knowledge
    Score 145   Passed State Score   131
    0063 Math Proofs
    Score 159   Passed State Score   137

1-15-11

    Benjamin Cooper
    0061 Math Content Knowledge
    Score 155   Passed State Score   131
    0063 Math Proofs
    Score 167   Passed State Score   137

Faculty Scholarly Activities

"Formulas Involving the Difference and Shift Operators and Fibonacci-Like Sequences" accepted for publication in the journal *Congressus Numerantium*.

"A General Type of Egorychev's Linear Transformations" at The Forty-second Southeastern International Conference on Combinatorics, Graph Theory, and Computing in March 2010 at Florida Atlantic University in Boca Raton, FL.

"Crossed Products of Certain Non-Simple, Non-Unital C*-Algebras" at the Joint Meeting of the AMS and MAA in New Orleans in January 2011.

"The Cantor Set: Explorations in Mathematical Weirdness" at the Francis Marion University Science Symposium in February 2011.

AP Summer Teacher Institute grant from the South Carolina Department of Education to host an AP Calculus BC Institute in Summer 2011.

"Why Sunshades Fold Oddly" as the invited address at the Pee Dee Regional High School Mathematics Tournament (13Dec) and at the Mathematical Association of America Southeastern Sectional Meeting (1-2April) at the University of Alabama in Tuscaloosa.

"Come Ride with Me on the Ferris Wheel Using GEOGEBRA and TI-84" at the 2010 SCCTM Fall Conference, 34th Annual Business Meeting with Teachers Teaching with Technology Region Conference on October 21 -22 in Greenville, SC.

"Come Ride with Me on the Ferris Wheel Using the TI-84 Plus Calculator" at the 2011 Teachers Teaching with Technology Professional Development from Texas Instruments International Conference on February 25-27 in San Antonio, TX.

"A New Look at Old Functions" invited address at an undergraduate mathematics colloquium at Pennsylvania College of Technology.

"4-cycle Decompositions of $(\lambda+m)K_{v+u}$ with holes of size mK_v" at the University of South Carolina Combinatorics Seminar in April 2011.

"Popular Culture and the Classroom: From Games to Non-Profit Agencies" at the Popular Culture/American Culture Associations National Conference in St. Louis in April 2011.

"More Math and the Comics" at the 2010 annual meeting of the South Carolina Council of Teachers of Mathematics (SCCTM) held in Greenville, South Carolina.

"Projects with Applications of Differential Equations and MATLAB" at the International Conference of Technology in Collegiate Mathematics (ICTCM) in Denver, CO, in March 2011.

"Why Do We Have to Learn This? (Mathematics in Biology and Engineering)" at the FMU Science Symposium in September 2010.

Two courses in statistical consulting (Stat 790 – Seminar in Statistical Consulting and Stat 791 – Practicum in Statistical Consulting) and a course in probability theory (Stat 811 – Probability Theory II) from the University of South Carolina.

"Discrete Projects for High School" at the 2010 South Carolina Council of Teachers of Mathematics (SCCTM) Fall Conference in Greenville, SC, on October 22, 2010.

"Discrete Dynamical Modeling for Freshmen" at the Joint Mathematics Meetings in New Orleans, LA, January 6-10, 2011.

"MAA Updates Testing for Calculus Readiness" in the February/March Issue of the MAA Focus.

"Using the TI-10 and TI-15 Calculators to Teach Mathematics Concepts" at the 2011 T3 International Conference in San Antonio, TX, February 2011.