

**Assessment Report
Academic Year 2003-2004**

Department: Mathematics

Program: MATHBS

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Mission of University

A Carnegie Doctoral/Research Extensive and SREB Category 1 institution, The University of Southern Mississippi's principal service area is South Mississippi. Southern Miss provides leadership for the entire state, region, and nation through:

- teacher preparation, economic development, polymer science, international programs, health services, and the arts;
- faculty innovation and research achievements;
- academic programs focused on wellness, societal needs, and quality of life;
- a strong, varied general education curriculum;
- undergraduate, masters and doctoral programs in the sciences, technology, education, psychology, criminal justice, economic development, the humanities, business, health, and the arts;
- cultural opportunities and holistic arts education; and
- students engaged in learning outside the classroom.

Southern Miss commits to sustaining these strengths while nurturing opportunities that create a vigorous region, engage students, and promote discourse, and enhance quality of life. The University of Southern Mississippi ascribes to the principles of constant quality improvement and pledges effectiveness and productivity in the achievement of its mission.

Mission of College

The role of the college is to implement the university's mission in science and technology through education, research, economic development, and service.

Mission of Department

The primary mission of the Department of Mathematics is the transmission, discovery, creation, and expansion of mathematical knowledge. Its curriculum is designed to encourage: learning based upon rational inquiry, problem solving, creativity, and intellectual initiative. Its instructional thrusts run the gamut from basic skill development designed to create a mathematically literate undergraduate populace, to meeting specific educational needs of students outside the science and technology establishment, to the creation and delivery of innovative and effective teacher-training programs, to the engendering of a strong mathematics knowledge base among those who will be charged with contributing to both the regional and national scientific enterprises. In addition, the members of our graduate faculty are also charged with the development of new and innovative curricula, with the expansion of the frontiers of mathematical knowledge, and with sharing their results with the community at large via publication and presentation. The undergraduate program serves students primarily from the southern region of the state. The students are predominantly the first members of their family to attend college. The graduate programs serve a constituency that is broadly-based. Students are drawn both regionally and internationally.

Purpose of MATHBS Program

The primary mission of the undergraduate mathematics program is to

- Develop mathematical thinking and communication skills
- Communicate the breadth and interconnections of the mathematical sciences
- Require study in depth
- Use technology for problem solving and to promote understanding

Student Learning Outcomes	Assessment Criteria & Evaluation Methods	Assessment Results	Use of Results
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<p>1. Students should understand theory and applications of calculus as set forth in departmental syllabus.</p>	<p>1a. Students must pass each course of the calculus sequence with a grade of C or better before entering the next course.</p> <p>1b. Students must demonstrate conceptual knowledge of calculus in order to complete programming projects in MAT 305 (Mathematical Programming in Maple).</p> <p>1c. Mathematics Student Portfolio.</p>	<p>During spring 2004 we commenced the collection of material for the Mathematics Student Dossier. This was done for each math major in each enrolled mathematics course. The instructor of each course is responsible for the submission of at least one dossier item from each mathematics major in that class. Data collection is not yet sufficiently complete and has not been analyzed at present.</p>	<p>Our undergraduate degree programs have already been changed to reflect the changes in the core.</p> <p>During fall 2003, faculty members William Hornor, Barry Piazza, and Wallace Pye attended the Mathematics Education Reform (MER) in Anchorage, Alaska. They came away from this meeting with several assessment ideas that were incorporated into the assessment plan for MATHBS. The principal assessment instrument is the Mathematics Student Portfolio. Data is still being gathered. The first evaluation of the portfolios for graduating mathematics students is scheduled for fall 2005.</p> <p>Evaluation methods have been changed so that they are quantifiable and measurable. It is premature to make further changes until we have done further analysis.</p>
<p>2. Students will learn the fundamental logic needed or deductive reasoning and will construct proofs of some elementary theorems using quantifiers, indirect and direct proofs, and mathematical induction.</p>	<p>2a. Students must pass MAT 326 (Linear Algebra) and MAT 340 (Discrete Mathematics) with grades of C or better before they can receive credit in upper-level mathematics electives.</p> <p>2b. Mathematics Student Portfolio.</p>		<p>Evaluation methods have been changed so that they are quantifiable and measurable. It is premature to make further changes until we have done further analysis.</p>

<p>3. Students should possess an understanding of the breadth of the mathematical sciences and their deep interconnecting principles; an awareness of the abstract nature of theoretical mathematics and the ability to write proofs; and an in depth understanding of at least one subject in mathematics.</p>	<p>3a. Students must include five upper-level mathematics electives in their academic program.</p> <p>3b. Students must include at least one sequence in their academic program.</p> <p>3c. Mathematics Student Portfolio.</p>		<p>Evaluation methods have been changed so that they are quantifiable and measurable. It is premature to make further changes until we have done further analysis.</p>
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<p>4. Students should be able to read, write, listen, and speak mathematically; read and understand technically-based materials; contribute effectively to group efforts; communicate mathematics clearly in ways appropriate to career goals; conduct research and make oral and written presentations on various topics; locate, analyze, synthesize, and evaluate information; think creatively at a level commensurate with career goals; and make effective use of the library. Students should possess skill in expository mathematical writing, have a disposition for questioning, and be aware of the ethical issues in mathematics.</p> <p>Students should be able to apply mathematics to a broad spectrum of complex problems and issues; formulate and solve problems; undertake some real-world mathematical modeling project; solve multi-step problems; recognize and express mathematical ideas imbedded in other contexts; and use the process by which mathematical and scientific facts and principles are applied to serve society.</p>	<p>4a. Students must take the senior capstone experience.</p> <p>4b. Mathematics Student Portfolio.</p>		<p>Evaluation methods have been changed so that they are quantifiable and measurable. It is premature to make further changes until we have done further analysis.</p>
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<p>5. Students should be able to write computer programs in a high level language using appropriate data structure to solve mathematical problems. Students should be able to create and document algorithms. Students should be able to use the computer for simulation and visualization of mathematical ideas and processes.</p>	<p>5a. Students must include CSC 101 & 101L (C++) in their programs.</p> <p>5b. Students must include MAT 305 (Mathematical Programming in Maple) in their programs.</p>		<p>Evaluation methods have been changed so that they are quantifiable and measurable. It is premature to make further changes until we have done further analysis.</p>
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<p>6. The program should prepare students for employment, graduate schools, or meaningful and enjoyable lives.</p>	<p>6a. Students must complete an exit interview just prior to their graduation.</p> <p>6b. Graduates will be asked to respond to a survey three-years, seven-years, fifteen-years and twenty-one-years after their graduation.</p> <p>6c. The annual number of mathematics graduates from the program should compare favorably with that of mathematics programs of similar institutions.</p>	<p>Surveys were sent to 136 graduates of the B.S. and M.S. programs who graduated in 1983, 1991, 1997, and 2001. There were 21 responses. Questions centered upon their satisfaction with their mathematics preparation, advisement and intellectual enhancement. The survey also asked respondents to provide their job titles and salary range, and asked whether they felt adequately prepared for employment or graduate study. Evaluation of the data indicated high satisfaction by the graduates in all areas.</p>	<p>There were respondents who made more than the highest salary category, which was \$105K. The survey was modified.</p>
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