

**Assessment Plan  
Academic Plan  
Academic Year 2005-2006**

**Department:** Mathematics

**Program:** BS Degree in Mathematics

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**Mission of University**

The University of Southern Mississippi is a comprehensive research extensive university. Our primary mission is to cultivate intellectual development and creativity through the generation, dissemination, application, and preservation of knowledge.

Our mission is supported by the values that have been formed through the history and traditions of our institution. These values are widely and deeply held beliefs of our faculty, staff, students, and administrators:

- Education provides opportunities to improve the quality of intellectual, social, economic, and personal well-being. These opportunities should be available to all who are willing and able to meet our standards of excellence.
- Our success is reflected by the degree to which our students become well-read, articulate, and creative and critical thinkers. It is measured by their display of specialized knowledge and abilities suitable to the pursuit of a career and life in our complex, ever-changing world.
- We cherish innovation in the creation and application of basic and applied research findings, creative and artistic expression, meaningful learning experiences, the scope of services provided to our students and the broader community that we sustain, and the continuing evolution of degree programs that both respond to and anticipate the evolving demands of our society, employers, and the labor market.
- Education encourages and advances the ideals of a pluralistic democratic society: civic responsibility, integrity, diversity, and ethical behavior.
- Academic freedom and shared governance are long-established and living principles at the university. We cherish the free exchange of ideas, diversity of thought, joint decision making, and individuals' assumption of responsibility.
- We make efficient and effective use of our resources, for we are accountable to our university communities, the Board of Trustees, and taxpayers.

*The Strategic Plan can be found at <http://www.usm.edu/ie/FINALBDAPPROVEDPLAN.doc>*

**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.

The College fulfills the University's educational aspirations in the following ways:

- Programs in science and technology,
- General Education courses that provide the basic skills and perspectives essential for preparing all university students for effective participation in contemporary life,
- Support for the Honors College and Honors course options,
- Specialized courses that serve the baccalaureate and graduate degree programs of the College and its sister colleges,
- Courses and programs that support teacher preparation,
- Appropriate and responsible integration of technology as a tool for learning, and
- Faculty advisement of students.

The College supports the University's declared aspirations through discipline-related activities that benefit the University, region, state, nation, and the international community, in the following ways:

- Research and scholarly pursuits,
- Faculty and student activities that reach beyond the classroom to a wider audience,

### **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 the BS in Mathematics Program and Relationship to University Mission and College Mission**

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

<b>Student Learning Outcomes</b>	<b>Assessment Criteria &amp; Evaluation Methods</b>	<b>Assessment Results</b>	<b>Use of Results</b>
1. Students should understand theory and applications of calculus.	1a. 80% of students will successfully complete MAT 305 (Mathematical Computing), which requires a conceptual knowledge of calculus.  1b. 80% of the calculus part of the Mathematics Student Portfolios will be deemed satisfactory or better as judged by the departmentally developed rubric for evaluating the Mathematics Student Portfolio.		

<p>2. Students will learn the fundamental logic needed for deductive reasoning and will construct proofs of some elementary theorems using quantifiers, indirect and direct proofs, and mathematical induction.</p>	<p>2a. 80% pass rate in the capstone course.</p> <p>2b. 80% of the logic part of the Mathematics Student Portfolios will be deemed satisfactory or better as judged by the departmentally developed rubric for evaluating the Mathematics Student Portfolio.</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. 80% pass rate in the capstone course.</p> <p>3b. 80% of the Mathematics Student Portfolios will be deemed satisfactory or better as judged by the departmentally developed rubric for evaluating the Mathematics Student Portfolio.</p>		
<p>4. Students should be mathematically conversant.</p>	<p>4a. 80% pass rate in the capstone course.</p> <p>4b. 80% of the Mathematics Student Portfolios will be deemed satisfactory or better as judged by the departmentally developed rubric for evaluating the Mathematics Student Portfolio.</p>		
<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. 80% of those who are employed in technical positions will respond “strongly agree” or “agree” to those statements in the annual department survey concerning job preparation.</p> <p>5b. 80% of the students in MAT 305 will demonstrate that they can write a well-documented Maple program.</p>		

<p>6. The program should prepare students for employment or graduate school. It should prepare them to have meaningful and enjoyable lives.</p>	<p>6a. 80% of graduating students in exit interviews will respond “strongly agree” or “agree” to the statement that the MATHBS program met their personal objectives.</p> <p>6b. 80% of alumni will respond “strongly agree” or “agree” to those statements concerning job preparation and intellectual/social development in the annual survey (sent to graduates three-years, seven-years, fifteen-years, and twenty-one-years after graduation).</p> <p>6c. The annual number of mathematics graduates from the program will compare favorably with that of mathematics programs of similar institutions in Mississippi.</p>		
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