

## Assessment Report Academic Year 2004-2005

**Department:** Mathematics  
**Program:** MATHLBSGC  
**Campus:** Gulf Coast  
**Submitted By:** Wallace Pye  
**Date:** June 15, 2005

### **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 the MATHLBS Program**

The primary mission of the undergraduate mathematics licensure 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
- Impart an appreciation of the history of mathematics and its applications, including recent work.
- Prepare students to be effective secondary school teachers.

**Program Information****Summary of Program Changes for Academic Year and Comparison to  
Main campus**

<p># of Graduates <u>  3  </u></p> <p>Alumni survey information: Seven out of seven respondents (100%) indicated satisfaction on all questions at the level 3 or above on a scale of 1 to 5. The average score was 4.54.</p>	<ul style="list-style-type: none"> <li>• A decision to continue to use the Mathematics Student Portfolio as an assessment instrument will require a commitment by the faculty to do their part.</li> <li>• The Survey of Graduates form must be modified to indicate the graduation campus.</li> </ul>
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Student Learning Outcomes	Assessment Criteria & Evaluation Methods	Assessment Results	Use of Results
<p>1. Students should understand theory and applications of calculus</p>	<p>1a. 90% of students will successfully complete MAT 305 (Mathematical Computing), which requires a conceptual knowledge of calculus</p> <p>1b. 90% 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>	<p>1a. None of these students took MAT 305.</p> <p>1b. There was no data.</p>	<p>1a. N/A</p> <p>1b. The Mathematics Student Portfolio was adopted in summer 2004. A further complication is that many majors take their calculus elsewhere. It may be necessary to assess calculus knowledge using MAT 305.</p>
<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. 90% pass rate in the capstone course</p> <p>2b. 90% 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>2a. Three out of three (100%) passed MAT 489/490.</p> <p>2b. There was insufficient data.</p>	<p>2a. The target was exceeded. However, the number of students is too small. The department should investigate how many students pursue the alternate route and determine why.</p> <p>2b. If the data were complete, it is believed that the target would have been met. No change is planned.</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. 90% pass rate in the capstone course</p> <p>3b. 90% 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>3c. Upper-level mathematics electives are those recommended by CUPM and NCTM.</p>	<p>3a. Three out of three (100%) passed MAT 489/490.</p> <p>3b. There was insufficient data.</p> <p>3c. All students take these prescribed upper-level mathematics courses.</p>	<p>3a. The target was exceeded. However, the number of students is too small. The department should investigate how many students pursue the alternate route and determine why.</p> <p>3b. The Mathematics Student Portfolio was adopted in summer 2004.</p> <p>3c. NCTM now requires that students possess an understanding of various number systems. The department must decide how this requirement can be met. The Mathematics Education Committee suggests requiring MAT 309.</p>
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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
  - make effective use of the library.
- Students should
- possess skill in expository mathematical writing
  - have a disposition for questioning
  - be aware of the ethical issues in mathematics
- Students should be able to
- apply mathematics to a broad spectrum of complex problems and issues
  - formulate and solve

4a. 90% pass rate in the capstone course (students spend one semester doing student teaching under a master teacher)

4b. 90% of the Mathematics Student Portfolios will be deemed satisfactory or better as judged by the departmentally developed rubric for evaluating the Mathematics Student Portfolio

4a. Three out of three (100%) passed MAT 489/490.

4b. There was insufficient data.

4a. The target was exceeded. However, the number of students is too small. The department should investigate how many students pursue the alternate route and determine why.

4b. The Mathematics Student Portfolio was adopted in summer 2004.

<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. All majors must include CSC 101 &amp; 101L (C++) in their programs</p> <p>5b. 90% of the students in MAT 305 will demonstrate that they can write a well-documented Maple program</p>	<p>5a. All majors include a computer programming language course in their program.</p> <p>5b. None of these students took MAT 305.</p>	<p>5a. The AMS recommends a computer programming requirement. There is no plan to change this requirement. However, since computer programming is housed in another department, it may make sense to assess computer programming knowledge only in MAT 305.</p> <p>5b. N/A</p>
<p>6. The program should prepare students to be effective secondary school teachers, for graduate school, and to have meaningful and enjoyable lives.</p>	<p>6a. 90% of exit interviews of students graduating from the program will be favorable to the department</p> <p>6b. 90% of respondents to the department survey ( sent to graduates three-years, seven-years, thirteen-years, and twenty-one-years after graduation) will be favorable</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>	<p>6a. There are no exit interviews at USMGC.</p> <p>6b. Seven out of seven respondents (100%) indicated satisfaction on all questions at the level 3 or above on a scale of 1 to 5. The average score was 4.54.</p> <p>6c. There were 22 bachelor degrees awarded, counting both emphases and both campuses (MSU = 14 &amp; UM = 27 in 2004).</p>	<p>6a. Implement exit interviews.</p> <p>6b. Target was met. No change is planned.</p> <p>6c. Target was met and met with fewer faculty members. No change is planned.</p>

Reviewed by Dean \_\_\_\_\_ (initials)      Date \_\_\_\_\_

Reviewed by Provost

\_\_\_\_ (initials)

Date \_\_\_\_\_