### Adding a New Major Code to the Curriculum

Please provide the following information when requesting a new major (programs and options) to be added to the curriculum. A major code will be assigned by the Office of the Registrar and a copy of this form will be mailed to the appropriate department.

**College/School:** College of Science & Liberal Arts (Main)

**Department:** Mathematical Sciences  
**Campus(S):** Main

**Level:**
- [ ] Bachelor of Arts (B.A.)
- [x] Bachelor of Science (B.S.)
- [ ] Master of Arts (M.A.)
- [ ] Master of Business Administration (M.B.A.)
- [ ] Master of Public Administration (M.P.A.)
- [ ] Master of Science (M.S.)
- [ ] Master of Science in Aviation (M.S.A.)
- [ ] Professional Master of Business Administration (P.M.B.A.)

**Educational Specialist (Ed.S.)**  
**Doctor of Education (Ed.D.)**  
**Doctor of Philosophy (Ph.D.)**  
**Doctor of Psychology (Psy.D.)**

**Program Title:** Mathematical Sciences

**Term to Be Initiated:** Spring 2004  
**Adviser for New Program:** Dr. M. Shaw

**Approvals:** Upon completion of appropriate department approvals, submit form to Chair, Graduate Council, or Chair, Undergraduate Curriculum Committee, and Provost for approval below and forward to Office of the Registrar.

**Department Head/Program Chair**  
**Date:** 10/20/03

**Dean or Associate Dean**  
**Date:** 10/20/03

**Chair, Graduate Council**  
**Date:**

**OR**

**Chair, Undergraduate Curriculum Committee**  
**Date:**

**Provost**  
**Date:**

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### Registrar's Office Use Only

- **FSA ATLAS**
- **SOAXREF**
- **SMAPRLE**
- **STVMAJR**
- **SOACURR**
- **Major Code Assigned**
- **SOAXCUR**
- **CIPC Code**
- **Operator Initials/Date**

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**Distribution:**  
Original – Registrar  
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Florida Institute of Technology • Office of the Registrar
150 West University Boulevard, Melbourne, FL 32901-6975 • (321) 674-7390 • Fax (321) 674-7827  
REG-229-6031
MEMORANDUM

TO: Dr. Clayton Baum, Chair, Undergraduate Curriculum Committee
FROM: Dr. Michael Shaw, Associate Head, Mathematical Sciences Department
DATE: October 23, 2003
SUBJECT: New Major Code for Mathematical Sciences

We propose a new undergraduate program in Mathematical Sciences. This program will attract more majors into our department. There is flexibility in the program to select courses to emphasize more theory or to see how mathematics aids development in scientific fields. It is designed to be cross disciplinary in the sciences and to enable students to apply mathematics to engineering, the physical sciences, biological sciences, environmental sciences, social sciences, and management. Students will be prepared to work in industry or to pursue graduate study.

The current Applied Mathematics program is very computational with an emphasis in the software engineering languages of C++ and FORTRAN and there is little flexibility within the program. All of our undergraduates have been able to find jobs pertaining to their degree or go to graduate school for the last several years.

However, many undergraduates that like to study mathematics are not happy with the current restraints imposed on their program of study. The new program would meet their needs.

The attached document shows the program in a form similar to its appearance in the catalog.
BACHELOR OF SCIENCE

DEPARTMENT OF MATHEMATICAL SCIENCES

Bachelor of Science

Head
V. Lakshmikantham, Ph.D.
Associate Head
Michael D. Shaw, Ph.D.

Professors
Ravi P. Agarwal, Ph.D., numerical analysis, differential and difference equations, differential inequalities, fixed point theorems.
Jenseng H. Dinlalalow, Dr. Sci., real analysis, operations research, stochastic processes, queuing theory.
V. Lakshmikantham, Ph.D., nonlinear analysis, differential and integral equations, numerical mathematics, evolution operators.

Associate Professors
Martin Bohner, Ph.D., time scales, linear dynamic systems, eigenvalue problems, variational analysis.
Dennis E. Jackson, Ph.D., partial differential equations, scattering theory.
Cecilia A. Knoll, Ph.D., calculus mastery program, differential equations, integrating technology into the curriculum.
Senem Koksal, Ph.D., stability analysis by Lyapunov's direct method, theory of nonlinear ordinary differential equations.
Michael D. Shaw, Ph.D., nonlinear differential equations, Lyapunov stability theory, variational of parameters methods, initial time difference.

Assistant Professors
Bradford D. Allan, Ed.D., statistical research methodology, testing and evaluation of education.
Jay J. Kovats, Ph.D., elliptic and parabolic partial differential equations.
Kamihui Perera, Ph.D., variational and topological methods for nonlinear partial differential equations, infinite dimensional Morse Theory.

Professors Emeriti
George E. Able, Ph.D.; Frank C. DeSua, Ph.D.

Bachelor of Science Degree Program

During the first two years, our majors share many courses with other students. The Mathematical Sciences program is interdisciplinary and designed to meet the needs of students in the 21st century. At this time, applications of mathematics across disciplines occur in engineering, science, and industry routinely. The curriculum includes courses in mathematics, as well as applied courses from related departments. Students can choose electives that will enable them to apply mathematics to engineering, the physical sciences, biological sciences, environmental studies, social sciences and business applications. Mathematics graduates are prepared to pursue graduate work or take their place in industry along with engineers and scientists.

DEGREE REQUIREMENTS

MATHEMATICS

MT 1001 Calculus 1 ............................................................. 4
MT 1002 Calculus 2 ............................................................. 4
MT 2001 Calculus 3 ............................................................. 4
MT 2201 Differential Equations/Linear Algebra ......................... 4
MT 3102 Introduction to Linear Algebra .................................. 3
MT 4101 Introductory Analysis .............................................. 3
MT 4201 Models in Applied Mathematics .............................. 3

COMPUTER LITERACY

At least two courses designated as CL, one of which involves using a high level programming language. 6

COMMUNICATION AND HUMANITIES CORE

COM 1101 Composition and Rhetoric ................................... 3
COM 1102 Writing about Literature ..................................... 3
HUM 2051 Civilization 1 ................................................... 3
HUM 2052 Civilization 2 ................................................... 3

TOTAL CREDITS REQUIRED 122

Note: Upper-division math courses may be offered in alternate years.
Positioning of electives is unrestricted.

At least 30 elective credits must be at the 3000+ level.

ELECTIVE RESTRICTIONS

Choices of electives are subject to approval by the student's advisor. Math electives must include at least one proof-based course in addition to the required courses in linear algebra and analysis.

Applied area electives must be chosen in consultation with an advisor. Typically, this means from a single department or program other than mathematics. Any science or engineering program can be chosen. Suitable management courses (courses with math prerequisites) can also be taken.

MASTER OF SCIENCE DEGREE PROGRAM

The master's degree program in mathematics is designed to produce mathematicians with competence in analysis who have breadth and versatility in mathematics and its applications in related fields. To this end, students entering the master's program in mathematics are required to select an applied field in which they wish to develop some expertise and complete six credits toward the degree from a proposed list of courses in mathematics. In addition, for each course in mathematics, students must have the freedom to select the approved electives to develop their own special interests and to complement their choice of applied field. The flexibility in the elective part of the curriculum allows students the opportunity to achieve a breadth of experience in mathematics and its uses in physical and engineering sciences, computer science or, operations research. At the same time, the program will allow other students to achieve more knowledge in a particular area in which they may wish to develop expertise. In either case, the program is organized to help students obtain an appropriate background for industrial employment or to pursue further graduate studies toward the doctoral degree. In either case, students will benefit from the range of options that are available in the mathematics master's program.

Admission requirements

Students are encouraged to consider which combinations of elective mathematics courses are appropriate for their choice of applied specialization and to discuss the program with their advisors as soon as graduate study begins.

ADMISSION REQUIREMENTS

 Applicants should have the equivalent of an undergraduate major in