

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 SITE(S) Main

DEPARTMENT Mathematical Sciences CAMPUS(S) Main

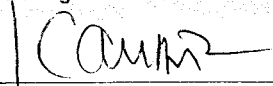
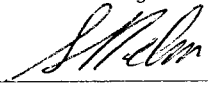
- LEVEL Bachelor of Arts (B.A.) Master of Arts (M.A.) Educational Specialist (Ed.S.)
 Bachelor of Science (B.S.) Master of Business Administration (M.B.A.) Doctor of Education (Ed.D.)
 Master of Public Administration (M.P.A.) Doctor of Philosophy (Ph.D.)
 Master of Science (M.S.) Doctor of Psychology (Psy.D.)
 Master of Science in Aviation (M.S.A.)
 Professional Master of Business Administration (P.M.B.A.)

PROGRAM TITLE *(restricted to 30 spaces, including blanks)*

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.

	<u>10/20/03</u>
Department Head/Program Chair	Date
	<u>10/20/03</u>
Dean or Associate Dean	Date
_____ Chair, Graduate Council	Date
OR	
_____ Chair, Undergraduate Curriculum Committee	Date
_____ Provost	Date

REGISTRAR'S OFFICE USE ONLY

FSA ATLAS _____	SOAXREF _____	SMAPRLE _____
STVMAJR _____	SOACURR _____	Major Code Assigned _____
SOAXCUR _____	CIPC Code _____	Operator Initials/date _____



MEMORANDUM

TO: Dr. Clayton Baum, Chair, Undergraduate Curriculum Committee

FROM: Dr. Michael Shaw, Associate Head, Mathematical Sciences Department

M. Shaw

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.

MATHEMATICAL SCIENCES

DEPARTMENT OF MATHEMATICAL SCIENCES

Bachelor of Science

Master of Science

Doctor of Philosophy

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.*

Jewgeni H. Dshalalow, Dr. Sci., *real analysis, operations research, stochastic processes, queueing theory.*

Charles T. Fulton, Ph.D., *ordinary and partial differential equations, spectral theory of differential operators, numerical linear algebra, numerical methods for two-point boundary value problems, parallel processing.*

V. Lakshmikantham, Ph.D., *nonlinear analysis, differential and integral equations, numerical mathematics, evolution operations.* Kamel Rekaab, Ph.D., *sequential analysis, design of experiments, applied data analysis, reliability theory.*

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.*

Scem Koksai, 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, variation of parameters methods, initial time difference.*

Assistant Professors

Bradford D. Allen, Ed.D., *statistical research methodology, testing and evaluation and modeling.*

Jay J. Kovats, Ph.D., *elliptic and parabolic partial differential equations.*

Kanishka Perera, Ph.D., *variational and topological methods for nonlinear partial differential equations, infinite dimensional Morse Theory.*

Professors Emeriti

George E. Abdo, 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

Required Courses

MATHEMATICS

MTH 1001 Calculus 1.....	4
MTH 1002 Calculus 2.....	4
MTH 2001 Calculus 3.....	4
MTH 2201 Differential Equations/Linear Algebra.....	4
MTH 3102 Introduction to Linear Algebra.....	3
MTH 4101 Introductory Analysis.....	3
MTH 4201 Models in Applied Mathematics.....	3
	25

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
	12

SCIENCE

BIO 1010 Biological Discovery 1.....	4
BIO 1020 Biological Discovery 2.....	4
CHM 1101 General Chemistry 1.....	4
CHM 1102 General Chemistry 2.....	4
PHY 1001 Physics 1.....	4
PHY 2002 Physics 2.....	4
PHY 2091 Physics Lab 1.....	1
PHY 2092 Physics Lab 2.....	1
Choose from these Physical/Life Science courses for a total of.....	16

Electives

Restricted Electives (Mathematics).....	9
Humanities.....	3
Social Science.....	3
Communications.....	3
Applied Area.....	9
Technical Electives.....	27
Free Electives.....	9
	63

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 taken from a single area of application. Typically, this means from a single department or program other than mathematics. Any science or engineering program can be chosen. Suitably chosen 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 to complete six credits toward the degree from approved courses outside the math curriculum. In addition, the master's program is organized so that students will have the freedom to select some of their mathematics 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 some 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, it 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.

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