Mathematics BS, Fiscal Mathematics Emphasis

General Education Requirements

All department majors must satisfy the university and appropriate school or college general education requirements. All mathematics courses may be used to meet the university's general education breadth of study requirement in natural sciences and mathematics.

Satisfactory/Unsatisfactory Restrictions

All department majors may not take mathematical sciences or related area courses on a satisfactory/unsatisfactory basis. Students considering graduate study should consult with their advisers about taking work on a satisfactory/unsatisfactory basis.

Degree Requirements

All courses of the department presented to meet the degree requirements must be completed with a grade of C- or better. At least four courses numbered 3000 or above must be taken in residence. Students must have a 2.0 grade point average in the mathematical sciences courses completed.

Students enrolling in introductory mathematics courses should check the prerequisites to determine if a satisfactory score on the Mathematics Placement Test is necessary. Placement into introductory courses assumes a mastery of two years of high school algebra.

A minimum grade of C- is required to meet the prerequisite requirement for any course except with permission of the department.

Note: Courses that are prerequisites for higher-level courses may not be taken for credit or quality points if the higher-level course has been satisfactorily completed.

Many students are qualified, as a result of having studied calculus in high school, to begin their major with MATH 1900, Analytic Geometry and Calculus II, or MATH 2000, Analytic Geometry and Calculus III. These students are urged to consult with the department before planning their programs. Credit for MATH 1800, Analytic Geometry and Calculus I, will be granted to those students who complete MATH 1900 with a grade of C- or better.

Declaring the Mathematics Major

Students seeking to major in mathematics are first designated as "pre-mathematics majors" until they have completed both MATH 1900 and MATH 2000 or equivalent courses. Upon successful completion of these two courses with grades of C or better, students will be allowed to declare mathematics as their major. Each of these courses must be completed successfully within two attempts.

Degree Requirements in Mathematics

All mathematics majors in all undergraduate programs must complete the mathematics core requirements.

Core Requirements

1. The following courses are required:

CMP SCI 1250	Introduction to Computing	3
MATH 1320	Introduction to Probability and Statistics	3
MATH 1800	Analytic Geometry and Calculus I	5
MATH 1900	Analytic Geometry and Calculus II	5
MATH 2000	Analytic Geometry and Calculus III	5
MATH 2020	Introduction to Differential Equations	3
MATH 2450		3
MATH 3250	Foundations of Mathematics	3
or CMP SCI 3130	Design and Analysis of Algorithms	
MATH 4100	Real Analysis I	3
Total Hours		**33**

2. The related area requirements as described below must be satisfied. Students seeking a double degree, either within this department or with another department, do not have to fulfill the related area requirements.

Related Area Requirements for majors in Mathematics

Candidates for the B.A. in Mathematics must satisfy the requirements in one of the groups below with a grade of C-or better. Candidates for the B.S.Ed. in Mathematics and B.S. in Mathematics must satisfy the requirements in two of the groups below with a grade of C-or better.

If candidates choose group 2, then they cannot apply either of the two courses listed in that group towards the additional 4000 level mathematics courses (beyond the core requirements) that must be completed for each of these degrees.

Students seeking a double degree, either within this department or with another department do not have to fulfill the related area requirements.

Related Area Courses

1) Computer Science		
Select two of the following:		6
CMP SCI 2250	Programming and Data Structures	
CMP SCI 2700	Computer Organization and Architecture	
CMP SCI 3130	Design and Analysis of Algorithms	
CMP SCI 4410	Introduction to Computer Graphics	
CMP SCI 4420	Introduction to Digital Image Processing and Computer Vision	
2) Statistics		
MATH 4200	Mathematical Statistics I	3
MATH 4210	Mathematical Statistics II	3
3) Biology		
BIOL 2102	Ecology	3
BIOL 2103	Ecology Laboratory	2
4) Biology		
BIOL 2012	Genetics	3
BIOL 4182	Population Biology	3
5) Chemistry		

CHEM 1111	Introductory Chemistry I (MOTR CHEM 150L)	5
CHEM 1121	Introductory Chemistry II	5
6) Chemistry		
CHEM 3312	Physical Chemistry I: Thermodynamics and Kinetics	3
And another 3000-level, or above, chemistry course.		3
7) Economics		
ECON 1001	Principles of Microeconomics (MOTR ECON 102)	3
ECON 1002	Principles of Macroeconomics (MOTR ECON 101)	3
ECON 4100	Introduction to Econometrics	4
8) Philosophy		
PHIL 3360	Formal Logic	3
PHIL 3380	Philosophy of Science	3
9) Physics		
PHYSICS 2111	Physics: Mechanics and Heat	5
PHYSICS 2112	Physics: Electricity, Magnetism, and Optics	5
10) Physics		
PHYSICS 3221	Mechanics	3
And another 3000 level, or above, physics course.		3
11) Business Administration		
SCMA 3320	Advanced Supply Chain and Operations Management	3
SCMA 4350	Prescriptive Analytics and Optimization	3
12) Engineering		
ENGR 2310	Statics	3
ENGR 2320	Dynamics	3

Emphasis Area Requirements

MATH 1320	Introduction to Probability and Statistics	3
MATH 1800	Analytic Geometry and Calculus I	5
MATH 1900	Analytic Geometry and Calculus II	5
MATH 2000	Analytic Geometry and Calculus III	5
MATH 2020	Introduction to Differential Equations	3
MATH 2450		3
MATH 3250	Foundations of Mathematics	3
MATH 4200	Mathematical Statistics I	3
MATH 4210	Mathematical Statistics II	3
Specialized Requirements		
MATH 4010	Financial Mathematics I	3
MATH 4020	Financial Mathematics II	3
FINANCE 3500	Financial Management	3
MATH 4005	Exploratory Data Analysis with R	3
In addition, two further courses in mathematics, statistics or computer science numbered above 4000.		6
Related Requirements		
ECON 4100	Introduction to Econometrics	4
ECON 4110	Applied Econometrics	4
or ECON 4130	Business and Economic Forecasting	
Complete two of the following courses:		6
FINANCE 3503	Computer Applications in Finance	
FINANCE 3520	Investments	
FINANCE 3521	Financial Engineering: Applying Derivatives	
FINANCE 3523	Fixed Income Analysis	
FINANCE 3540	Introduction to Financial Institutions and Financial Markets	
FINANCE 3561	Principles of Insurance	
Total Hours		**65**

B.S. Ed. in Secondary Education with Emphasis in Mathematics

The B.S. Ed. is a professional education degree designed for students who wish to pursue a teaching career in secondary schools. Much of the discipline-specific coursework parallels the B.A. or B.S. degree in the discipline; however, the Missouri Department of Elementary and Secondary Education (DESE) requires specific coursework for teacher certification. Therefore, students interested in the B.S. Ed. should contact the advising office (OASIS) 314-516-5937 in the College of Education for discipline-specific requirements. *Note: To obtain teaching certification, DESE requires a 3.0 GPA in the discipline and professional education coursework, as well as a 2.75 GPA overall.*

B.A. or B.S. in Mathematics with Master's Level Coursework for Secondary Teacher Certification

In addition to the B.S. Ed., students may opt to complete a B.A. or B.S. degree in their discipline as an undergraduate, followed by admission to the Graduate School for Master's level teaching certification. The College of Education has a one-year accelerated program for post-graduate certification called Teach in 12, or students can choose a traditional path to certification. Graduate coursework for certification can apply towards a Master's Degree in Secondary Education, with additional coursework. Students interested in Master's Level teacher certification should contact the advising office (OASIS) 314-516-5937 in the College of Education. *Note: To obtain teaching certification, DESE requires a 3.0 GPA in the discipline and professional education coursework, as well as a 2.75 GPA overall.*

Learning Outcomes

A successful undergraduate should, upon completion, be able to:

- Write clear, logically consistent proofs.
- Read, understand and assess the veracity of logical arguments or mathematical proofs.
- Reformulate problems or questions in relevant mathematical terms.
- Solve problems which involve analysis, algebra or linear algebra, elementary number theory.
- Interpret, formulate and solve applied problems in probability and statistics.
- Interpret, formulate and solve applied problems in mathematics relating to annuities, bonds and derivative investments.

Sample Four Year Plan

First Year

Fall	Hours	Spring	Hours
INTDSC 1003[1]	1	MATH 1900	5
ENGL 1100	3	MATH 1320	3
MATH 1800	5	ECON 1001	3
INFSYS 1800	3	EXPLORE - Humanities and Fine Arts	3
CORE - Communication Proficiency	3	INFSYS 2800	3
	15		**17**

Second Year

Fall	Hours	Spring	Hours
MATH 2000	5	MATH 2020	3
MATH 2450	3	MATH 3250	3
CMP SCI 1250	3	CORE - U.S. History and Government	3
ECON 1002	3	Cultural Diversity Requirement	3
ACCTNG 2400	3	Elective or minor	2
	17		**14**

Third Year

Fall	Hours	Spring	Hours
MATH 4010	3	MATH 4200	3
ECON 4100	4	MATH 4020	3
MATH 4005	3	FINANCE 3500	3
ENGL 3100	3	EXPLORE - Humanities and Fine Arts	3
Elective or minor	3	Elective or minor	3
	16		**15**

Fourth Year

Fall	Hours	Spring	Hours
MATH 4210	3	MATH/CMP SCI 4000-level course	3
ECON 4130	4	ECON 4110	4
FINANCE 35XX Course	3	FINANCE 35XX Course	3
EXPLORE - Humanities and Fine Arts	3	EXPLORE - Social Sciences	3
	13		**13**

Total Hours: 120

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INTDSC 1003 is required only for first-time freshmen and transfer students with less than 24 college credits.

PLEASE NOTE: This plan is an example of what a four year plan could look like for a typical student. Placement exam scores in math as well as the completion of coursework may change the plan. It should not be used in the place of regular academic advising appointments. All students are encouraged to meet with their advisor each semester. All requirements are subject to change.