BS in Mathematics

Degree Program Description

Mathematics is part of the foundation of all the sciences, engineering, statistics, and many social sciences. A degree in mathematics provides one with both the applied mathematics knowledge necessary to engage in these disciplines, and formal reasoning skills that can be applied in any area. The major is well suited for those interested in mathematics alone, or for those looking to supplement another major. Our students go on to jobs or further study in all the above disciplines, as well as many others (medical school or law school, for instance).

Major Program Requirements

The Mathematics Department offers a "Standard" BS, a BS with emphasis in Actuarial Science and Mathematical Finance, and a Dual Degree in Mathematics and Secondary Education with an Emphasis in Mathematics Education. In each case Arts and Science Breadth and Depth requirements (for the BS) must be satisfied, in addition to the Department Level Requirements (https://catalog.missouri.edu/collegeofartsandscience/mathematics/department-level-requirements-mathematics/), University (https://catalog.missouri.edu/academicdegreerequirements/universityrequirements/), general education (https://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements/), and College of Arts and Science (https://catalog.missouri.edu/collegeofartsandscience/#undergraduatetext) requirements. Students must also meet the following major program requirements. All major requirements in the College of Arts and Science must be completed with grades of C- or higher unless otherwise indicated. Note that the courses accepted for the science requirement by the Mathematics department are more restrictive than the Arts and Science requirement.

All BS degrees require completion of the Foreign Language requirement by one of: four years of a language in high school, completion of a foreign language sequence at MU, or a Foreign Language Alternative (12 credits at the 2000 level or above in an area, or related areas, approved by the Director of Undergraduate Studies).

Students may apply to be Math majors upon meeting the following criteria:

- Completion of ENGLSH 1000 and MATH 2300
- Both cumulative GPA and GPA in Math courses numbered 1500 and above (expect for 2100) of 2.5 or above.

All math courses required for the degree must be passed with a grade of C- or above.

Core Math Requirements for all Math degrees (24 credits)

MATH 1500	Analytic Geometry and Calculus I	5
MATH 1700	Calculus II	5
MATH 2300	Calculus III	3
MATH 3000	Introduction to Advanced Mathematics	3
MATH 4100	Differential Equations	3
MATH 4140	Matrix Theory	3
INFOTC 1040	Introduction to Problem Solving and Programming	3
or CMP_SC 1050	Algorithm Design and Programming I	
or CMP_SC 1300	Computing with Data in Python	
Total Credits		**25**

Additional requirements for the BS degree

MATH 4700	Advanced Calculus of One Real Variable I	3
MATH 4720	Introduction to Abstract Algebra I	3
Four approved 4000 level Math electives		
MATH 4120	Graph Theory and Combinatorics	3
MATH 4150	History of Mathematics	3
MATH 4300	Numerical Analysis	3
MATH 4310	Numerical Linear Algebra	3
MATH 4330	Theory of Numbers	3
MATH 4355	Quantitative Finance and Insurance I	3
MATH 4370	Interest Theory	3
MATH 4371	Models for Life Contingencies I	3
MATH 4372	Models for Life Contingencies II	3
MATH 4400	Introduction to Topology	3
MATH 4500	Applied Analysis	3
MATH 4540	Mathematical Modeling I	3
MATH 4560	Nonlinear Dynamics, Fractals and Chaos	3
MATH 4590	Quantitative Finance and Insurance II	3
MATH 4900	Advanced Multivariable Calculus	3
MATH 4920	Introduction to Abstract Linear Algebra	3
MATH 4940	Introduction to Complex Variables	3
MATH 4315	Introduction to Mathematical Statistics	3
or STAT 4710	Introduction to Mathematical Statistics	
MATH 4320	Introduction to Probability Theory	3
or STAT 4750	Introduction to Probability Theory	
MATH 4520	Statistical Inference I	3
or STAT 4760	Statistical Inference	
Science Requirement: 12 or more credits from the two groups below. Both groups must be represented.		
Group I:		
PHYSCS 2750	University Physics I	5
PHYSCS 2760	University Physics II	5
CHEM 1400 & CHEM 1401	College Chemistry I and College Chemistry I Laboratory	4
CHEM 1410 & CHEM 1411	College Chemistry II and College Chemistry II Laboratory	4
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5

Group II: Any 4000 level courses in Statistics or Computer Science.Exactly one of STAT 4710, STAT 4750 or STAT 4760 may be used for both Group II and as an approved 4000 level Math elective

Additional requirements for the BS Degree (Dual degree for Math and Secondary Education majors)

- One of: MATH 4300, MATH 4500, or MATH 4700
- One of MATH 4510 or MATH 4720
- Four approved 4000 level Math electives
- Science Requirement: 10 or more credits from the two groups from the Course List above. Both groups must be represented.

Additional requirements for the BS degree (Double major in Math and Economics)

- MATH 4700
- One of MATH 4310, MATH 4720, or MATH 4900
- Four approved 4000 level Math electives
- Science Requirement: 10 or more credits from the two groups from the Course List above. Both groups must be represented.

Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	**CR**	**Spring**	**CR**
MATH 1500 (Math and Quantitative Reasoning)	5	MATH 1700	5
CMP_SC 1300 or INFOTC 1040	3	Behavioral Science from Arts and Science	3
ENGLSH 1000	3	Humanities from Arts and Science	3
Missouri State Law Requirement: Social Science from Arts and Science	3	Second major, minor, certificate, or elective	3
	14		**14**
Second Year			
Fall	**CR**	**Spring**	**CR**
MATH 2300	3	MATH 4100	3
Humanities, First Writing Intensive	3	MATH 4140	3
Science Requirement (Group I): Biological or Physical Science lab	5	Science Requirement (Group I): Biological or Physical Science lab	5
Second major, minor, certificate, or elective	3	Second major, minor, certificate, or elective	3
Second major, minor, certificate, or elective	2	Second major, minor, certificate, or elective	2
	16		**16**
Third Year			
Fall	**CR**	**Spring**	**CR**
MATH 3000W	3	MATH 4700	3
STAT 4710 or 4750 (Math, approved 4000-level and Science Requirement (Group II))	3	Math, approved 4000-level	3
Biological, Physical, or Mathematical Science	3	Humanities, 2000+ level	3
Second Language Alternative	3	Second Language Alternative	3
Second major, minor, certificate, or elective	3	Second major, minor, certificate, or elective	3
	15		**15**
Fourth Year			
Fall	**CR**	**Spring**	**CR**
MATH 4720	3	Math, approved 4000-level	3
Behavioral or Social Science, 2000+ level	3	Math, approved 4000-level	3
Second Language Alternative	3	Second Language Alternative	3
Second major, minor, certificate, or elective	3	Second major, minor, certificate, or elective	3
undefined	3	Second major, minor, certificate, or elective	3
	15		**15**

Total Credits: 120