Bachelor of Arts in Mathematics

Why study mathematics?

Because mathematics is a framework upon which humanity builds an understanding of the world.

The degree of Bachelor of Arts in Mathematics offers in depth training in mathematics. A B.A. degree in mathematics at KU allows you to focus on the mathematics that is most relevant and interesting to you. A total of 120 hours is required to graduate with a B.A. in the College of Liberal Arts and Sciences. The requirements for all students earning a B.A. in the College include the KU Core 34 Curriculum (https://catalog.ku.edu/core34/), a laboratory or field experience, and proficiency in a language other than English.

Undergraduate Admission

Admission to KU

All students applying for admission must send high school and college transcripts to the Office of Admissions. Prospective first-year students should be aware that KU has qualified admission requirements that all new first-year students must meet to be admitted. Consult the Office of Admissions (http://admissions.ku.edu/) for application deadlines and specific admission requirements.

Visit the International Support Services (http://www.iss.ku.edu/) for information about international admissions.

Students considering transferring to KU may see how their college-level course work will transfer on the Office of the University Registrar (https://registrar.ku.edu/credittransfer/) website.

Mathematics Programs

Separate programs lead to the B.A. in mathematics and the B.S. in mathematics. The B.A. has fewer mathematics course requirements and more general education requirements. The B.S. requires more mathematics courses, three courses in mathematics applications, and fewer general education courses. Students wishing to attend graduate school in mathematics or to pursue a career that makes substantial use of mathematics (as an actuary, for example) should get a B.S. in mathematics. Many students majoring in mathematics are interested in a liberal arts degree; such students may want to consider the B.A. in mathematics. Students who wish to teach mathematics in high school should pursue a B.A. or B.S. in mathematics while participating in the STEM (https://stemteach.ku.edu/)Teach program (https://stemteach.ku.edu/).

Requirements for the B.A. Major

Code	Title	Hours
Mathematics Core Knowledge and Skills		
Majors must complete courses as specified in each of the following areas:		
Calculus I. Satisfied by one of the following:		
MATH 125	Calculus I	4
or MATH 145	Calculus I, Honors	
Calculus II. Satisfied by one of the following:		
MATH 126	Calculus II	4
or MATH 146	Calculus II, Honors	
Calculus III. Satisfied by one of the following:		
MATH 127	Calculus III	4
or MATH 147	Calculus III, Honors	
Elementary Linear Algebra. Satisfied by one of the following:		
MATH 290	Elementary Linear Algebra	2
or MATH 291	Elementary Linear Algebra, Honors	
Analysis. Satisfied by one of the following:		
MATH 500	Intermediate Analysis	3
or MATH 765	Mathematical Analysis I	
Linear Algebra. Satisfied by one of the following:		
MATH 590	Linear Algebra	3
or MATH 790	Linear Algebra II	
Math Sequence & Breadth Requirement		**9**
Math Sequence: Majors must choose one of the following 2-course sequences. Courses selected above may contribute to the minimum of 6 hours.		
Elementary Number Theory. Satisfied by:		
MATH 540 & MATH 791	Elementary Number Theory and Modern Algebra	
Computing. Satisfied by:		
MATH 601 & MATH 791	Algebraic Topics in Computing: _____ and Modern Algebra	
Regression Analysis. Satisfied by:		
MATH 605 & MATH 611	Applied Regression Analysis and Time Series Analysis	
Probability & Statistics. Satisfied by:		
MATH 627 & MATH 628	Probability and Mathematical Theory of Statistics	
Complex Variable and Applications. Satisfied by:		
MATH 646 & MATH 765	Complex Variable and Applications and Mathematical Analysis I	
Partial Differential Equations. Satisfied by:		
MATH 647 & MATH 650	Applied Partial Differential Equations and Nonlinear Dynamical Systems	
Variations and Integral Equations. Satisfied by:		
MATH 648 & MATH 650	Calculus of Variations and Integral Equations and Nonlinear Dynamical Systems	
Geometry. Satisfied by:		
MATH 660 & MATH 661	Geometry I and Geometry II	
Probability Theory. Satisfied by:		
MATH 727 & MATH 728	Probability Theory and Statistical Theory	
Analysis. Satisfied by:		
MATH 765 & MATH 766	Mathematical Analysis I and Mathematical Analysis II	
Numerical Analysis. Satisfied by:		
MATH 781 & MATH 782	Numerical Analysis I and Numerical Analysis II	
Linear & Modern Algebra. Satisfied by:		
MATH 790 & MATH 791	Linear Algebra II and Modern Algebra	

Analysis & Complex Variables. Satisfied by:	
MATH 500 & MATH 646	Intermediate Analysis and Complex Variable and Applications
Statistics & Regression Analysis. Satisfied by:	
MATH 526 & MATH 605	Applied Mathematical Statistics I and Applied Regression Analysis
Statistics & Time Series Analysis. Satisfied by:	
MATH 526 & MATH 611	Applied Mathematical Statistics I and Time Series Analysis
Regression Analysis & Statistical Data Science	
MATH 605 & MATH 608	Applied Regression Analysis and Statistical Data Science
Statistical Data Science & Time Series Analysis	
MATH 608 & MATH 611	Statistical Data Science and Time Series Analysis
Number Theory & Introductory Modern Algebra. Satisfied by:	
MATH 540 & MATH 558	Elementary Number Theory and Introductory Modern Algebra
Modern Algebra & Coding Theory. Satisfied by:	
MATH 558 & MATH 601	Introductory Modern Algebra and Algebraic Topics in Computing: _____
Numerical Methods & Linear Algebra. Satisfied by:	
MATH 581 & MATH 591	Numerical Methods and Applied Numerical Linear Algebra
MATH 590 & MATH 591	Linear Algebra and Applied Numerical Linear Algebra
Numerical Methods and Computational Data Science	
MATH 581 & MATH 582	Numerical Methods and Computational Data Science
MATH 582 & MATH 591	Computational Data Science and Applied Numerical Linear Algebra
Computational & Statistical Data Science	
MATH 582 & MATH 608	Computational Data Science and Statistical Data Science
Linear Algebra. Satisfied by:	
MATH 590 & MATH 790	Linear Algebra and Linear Algebra II
Complex Variables & Partial Differential Equations. Satisfied by:	
MATH 646 & MATH 647	Complex Variable and Applications and Applied Partial Differential Equations
Partial Differential Equations & Calculus of Variations. Satisfied by:	
MATH 647 & MATH 648	Applied Partial Differential Equations and Calculus of Variations and Integral Equations
Combinatorics & Graph Theory. Satisfied by:	
MATH 724 & MATH 725	Combinatorial Mathematics and Graph Theory
Math Breadth: Majors must complete a minimum of 5 mathematics courses numbered 300 and above (each at least 3 credits), excluding MATH 365, MATH 409 and MATH 410, but including the upper division courses used to satisfy the core and sequence requirements. The goals are to gain exposure to a variety of concepts and methods in mathematics, develop abstract and critical thinking, and acquire knowledge to prepare for a career using mathematics, further study of mathematics, or interdisciplinary work involving mathematics.	
Capstone Course	
MATH 699	Directed Reading (or any approved Capstone requirement) 1
Total Hours	**30**

Major Hours & Major GPA

While completing all required courses, majors must also meet each of the following hour and grade-point average minimum standards:

Major Hours
Satisfied by 30 hours of major courses.

Major Hours in Residence
Satisfied by a minimum of 15 hours of KU resident credit in the major.

Major Junior/Senior Hours
Satisfied by a minimum of 15 hours from junior/senior courses (300+) in the major.

Major Junior/Senior Graduation GPA
Satisfied by a minimum of a 2.0 KU GPA in junior/senior courses (300+) in the major. GPA calculations include all junior/senior courses in the field of study including F's and repeated courses. See the Semester/Cumulative GPA Calculator (https://sis.ku.edu/gpa-calculator/).

Below is a sample 4-year plan for students pursuing the BA in Mathematics. To view the list of courses approved to fulfill KU Core 34 Goals, please visit the KU Core 34 page (https://catalog.ku.edu/core34/).

This degree plan assumes students will have the equivalent of MATH 101 prior to freshman year, fall semester.

Freshman

Fall	Hours	Spring	Hours
MATH 125 or 145 (Core 34: Math and Statistics (SGE))[030*]	4	MATH 126 or 146 (BA Quantitative Reasoning (QR))	4
Core 34: English (SGE)[010]	3	Core 34: English (SGE)[010]	3
1st Semester Language (BA Second Language)	5	2nd Semester Language (BA Second Language)	5
Core 34: Social and Behavior Science (SGE)[050]	3	Core 34: Communications (SGE)[020]	3
	15		**15**

Sophomore

Fall	Hours	Spring	Hours
MATH 127 or 147 (Major Requirement)	4	MATH 590 (Major Requirement)	3
MATH 290 or 291 (Major Requirement)	2	4th Semester Language, or 1st semester of Another Language (BA Second Language)	3
3rd Semester Language (BA Second Language)	3	Core 34: Social and Behavior Science (SGE)[050]	3
Core 34: Natural and Physical Sciences (SGE)[040]	4-5	Core 34: Global Culture (SGE)[070]	3
BA Laboratory/Field Experience (LFE)	1	Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3

Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3		
	17-18		**15**

Junior

Fall	**Hours**	**Spring**	**Hours**
MATH 500 (Major Requirement)	3	Math Sequence Course 1 of 2[1]	3
Core 34: Arts and Humanities (SGE)[060]	3	Mathematics Breadth[2]	3
Core 34: US Culture (SGE)[070]	3	Core 34: Arts and Humanities (SGE)[060]	3
Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3	Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3
Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3	Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3
	15		**15**

Senior

Fall	**Hours**	**Spring**	**Hours**
Math Sequence Course 2 of 2 [1]	3	MATH 699 (or any approved Capstone course)[1]	1
Mathematics Breadth[2]	3	Mathematics Breadth[2]	3
Mathematics Breadth[2]	3	Mathematics Breadth[2]	3
Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3	Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3
Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3	Second Area of Study/ Elective/Degree/Junior-Senior Hours[3]	3
	15		**13**

Total Hours 120-121

[1] Majors must complete a 2-course sequence (http://catalog.ku.edu/liberal-arts-sciences/math/ba/#requirementstext). Courses selected to fulfill other major requirements, may also contribute to the minimum of 6 hours for the sequence. Completion of four upper division mathematics courses that form two sequences in mathematics and statistics serve as preparation to take MATH 699, which can fulfill the capstone requirement.

[2] 15 credit hours are required for the Mathematics Breadth. This includes math courses and electives at 300+ (excluding MATH 365, MATH 409, MATH 410)

[3] Hour requirements (incl. 45 jr/sr hrs) are typically met through Core 34, degree, major, second area of study and/or elective hours. Students completing the BGS with a major must choose a secondary area of study. Individual degree mapping is done in partnership with your advisor.

Please note:

All students in the College of Liberal Arts and Sciences are required to complete 120 total hours of which 45 hours must be at the Jr/Sr (300+) level.

Notes:

* - This course is a Required major course and is also part of Core 34: Systemwide General Education. If this course is not taken to fulfill the Core 34:SGE requirement, it must be taken in place of elective hours.

** - This course is a Recommended Core 34: Systemwide General Education course. This specific course is not required but is recommended by the program's faculty.

*** - This course is a Required Core 34: Systemwide General Education course. This program is approved by the Kansas Board of Regents to require this specific Core 34:Systemwide General Education course. If a student did not take this course it must be taken in addition to other degree requirements.

At the completion of this program, students will be able to:

- Interpret and solve problems using symbolic equations and inequities, as well as numerical and graphical data.
- Read and construct rigorous mathematical arguments and proofs.
- Know concepts and be able to use techniques from a variety of mathematical disciplines.

Departmental Honors

For undergraduate departmental honors, the student must satisfy the College requirements for honors, attain a grade-point average of 3.5 in all mathematics courses numbered 500 and above. The student must also complete two out of the following four sequences: MATH 727 and MATH 728; MATH 765 and MATH 766; MATH 781 and MATH 782; and MATH 790 and MATH 791, with a grade no lower than B- in each of these courses. The student must make a satisfactory oral presentation to the department, preferably on a topic related to his or her mathematics course work. Preparation should include enrollment in MATH 699 Directed Reading (for 1 or more credit hours) with a faculty mentor.