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 Curriculum (http://kucore.ku.edu), 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. Unless they are college transfer students with at least 24 hours of credit, prospective students must send ACT or SAT scores 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 Office of International Student and Scholar 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 Admissions (http://credittransfer.ku.edu) website.

Admission to the College of Liberal Arts and Sciences

Admission to the College is a different process from admission to a major field. Some CLAS departments have admission requirements. See individual department/program sections for departmental admission requirements.

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, an applied mathematics concentration, 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 UKanTeach program (http://ukanteach.ku.edu).

Requirements for the B.A. Major

Mathematics Core Knowledge and Skills (20)

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 Requirement (6)

Majors must choose one of the following 2-course sequences. Courses selected above may contribute to the minimum of 6 hours.

- Probability & Statistics. Satisfied by:
  - MATH 627 Probability
  - & MATH 628 Mathematical Theory of Statistics
- Geometry. Satisfied by:
  - MATH 660 Geometry I
  - & MATH 661 Geometry II
- Analysis. Satisfied by:
  - MATH 765 Mathematical Analysis I
  - & MATH 766 Mathematical Analysis II
- Numerical Analysis. Satisfied by:
  - MATH 781 Numerical Analysis I
  - & MATH 782 Numerical Analysis II
- Linear & Modern Algebra. Satisfied by:
  - MATH 790 Linear Algebra II
  - & MATH 791 Modern Algebra
- Analysis & Complex Variables. Satisfied by:
  - MATH 500 Intermediate Analysis
  - & MATH 546 Complex Variable and Applications
- Statistics & Regression Analysis. Satisfied by:
  - MATH 526 Applied Mathematical Statistics I
  - & MATH 605 Applied Regression Analysis
- Statistics & Time Series Analysis. Satisfied by:
  - MATH 526 Applied Mathematical Statistics I
  - & MATH 611 Time Series Analysis
- Number Theory & Introductory Modern Algebra. Satisfied by:
  - MATH 540 Elementary Number Theory
  - & MATH 558 Introductory Modern Algebra
- Modern Algebra & Coding Theory. Satisfied by:
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MATH 558    Introductory Modern Algebra
& MATH 601    and Algebraic Coding Theory
Numerical Methods & Linear Algebra. Satisfied by:
MATH 581    Numerical Methods
& MATH 591    and Applied Numerical Linear Algebra
Linear Algebra. Satisfied by:
MATH 590    Linear Algebra
& MATH 790    and Linear Algebra II
Complex Variables & Partial Differential Equations. Satisfied by:
MATH 646    Complex Variable and Applications
& MATH 647    and Applied Partial Differential Equations
Partial Differential Equations & Calculus of Variations. Satisfied by:
MATH 647    Applied Partial Differential Equations
& MATH 648    and Calculus of Variations and Integral Equations
Combinatorics & Graph Theory. Satisfied by:
MATH 724    Combinatorial Mathematics
& MATH 725    and Graph Theory

Math Breadth (15)
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.

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 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 (http://clas.ku.edu/undergrad/tools/gpa).

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 Goals, please visit the KU Core website (http://kucore.ku.edu/courses).

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

Freshman

<table>
<thead>
<tr>
<th>Fall</th>
<th>Hours Spring</th>
<th>Hours</th>
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<tbody>
<tr>
<td>ENGL 101 (Goal 2.1 (2 crs req), BA Writing I)</td>
<td>3 ENGL 102 (Goal 2.1 (2 crs req), BA Writing II)</td>
<td>3</td>
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Sophomore

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<tr>
<th>Fall</th>
<th>Hours Spring</th>
<th>Hours</th>
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<tbody>
<tr>
<td>MATH 127 or 147 (Major Requirement)</td>
<td>4 MATH 590 (Major Requirement)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 290 or 291 (Major Requirement)</td>
<td>2 4th Semester Language, or 1st semester of Another Language (BA Second Language)</td>
<td>3-5</td>
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Junior

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<thead>
<tr>
<th>Fall</th>
<th>Hours Spring</th>
<th>Hours</th>
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</thead>
<tbody>
<tr>
<td>MATH 500 (Major Requirement)</td>
<td>3 Math Sequence Course 300+ (Major Requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Goal 3 Humanities</td>
<td>3 Math Elective or Sequence Course 300+ (Major Requirement)</td>
<td>3</td>
</tr>
<tr>
<td>Goal 4.1 US Diversity</td>
<td>3 Goal 5 Social Responsibility &amp; Ethics</td>
<td>3</td>
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Senior

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<thead>
<tr>
<th>Fall</th>
<th>Hours Spring</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Math Sequence Course 300+ (Major Requirement)</td>
<td>3 Elective or possible minor course 300+ (Total Hours)</td>
<td>3</td>
</tr>
<tr>
<td>Math Sequence Course 300+ (Goal 6 Integration &amp; Creativity)</td>
<td>3 Elective or possible minor course 300+ (Total Hours)</td>
<td>3</td>
</tr>
<tr>
<td>Elective or possible minor course 300+ (Total Hours)</td>
<td>3 Elective or possible minor course 300+ (Total Hours)</td>
<td>3</td>
</tr>
</tbody>
</table>

Total Hours: 120-123
The BA requires completion of two courses of collegiate-level writing instruction. Students who test out of Composition will still need to complete ENGL 102 (or equivalent) and one additional Goal 2.1 course.

Majors must complete a 2-course sequence (http://catalog.ku.edu/liberal-arts-sciences/math/ba/#requirements). 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 can fulfill KU Core Goal 6 (http://kucore.ku.edu/experiences).

Visit this website (https://collegeadvising.ku.edu/sites/collegeadvising.ku.edu/files/docs/BA.QuantitativeReasoning.pdf) for a list of courses that fulfill the BA Quantitative Reasoning requirement.

Please note:

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

The same course cannot be used to fulfill more than one KU Core Goal. However, overlap of a KU Core course with a major or degree-specific requirement is allowed. Overlapping is recommended to allow more opportunities to explore other majors and/or minors.

**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.