MATHEMATICS, BSLAS

for the degree of Bachelor of Science in Liberal Arts & Sciences Major in Mathematics

Students in the Mathematics major can choose one of the following to complete the major:

Mathematics major (p. 1)

Mathematics major, Applied Mathematics concentration (http://catalog.illinois.edu/undergraduate/las/mathematics-bslas/applied-mathematics/)

Mathematics major, Data Optimization concentration (http://catalog.illinois.edu/undergraduate/las/mathematics-bslas/data-optimization/)

Mathematics major, Math Doctoral Preparation concentration (http://catalog.illinois.edu/undergraduate/las/mathematics-bslas/math-doctoral-preparation/)

Mathematics major, Mathematics Teaching concentration (http://catalog.illinois.edu/undergraduate/las/mathematics-bslas/teaching-mathematics/)

Mathematics is a broad discipline that contains a range of areas of specialization within it. The required core courses provide fundamental background for mathematics in general. The concentrations allow the student to broaden this background or begin to specialize. Students must complete the core courses and a concentration.

An entering student in mathematics should have academic preparation to enroll in MATH 220 (http://catalog.illinois.edu/search/?P=MATH%20220) during the first semester. Admission to MATH 220 (http://catalog.illinois.edu/search/?P=MATH%20220) requires an acceptable ALEKS score. A student should attain grades of B in calculus in order to complete the advanced courses successfully.

Undergraduate programs in Mathematics

Actuarial Science, BSLAS (http://catalog.illinois.edu/undergraduate/las/actuarial-science-bslas/)

Mathematics, BSLAS (p. 1)

Mathematics & Computer Science, BSLAS (http://catalog.illinois.edu/undergraduate/eng_las/mathematics-computer-science-bslas/)

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A Major Plan of Study form, declaring concentration and supporting coursework, must be completed and submitted to the LAS Student Academic Affairs Office except for students in the Teaching of Mathematics concentration. Please complete this form with an advisor in the Mathematics Undergraduate Office within 1-2 semesters of completing MATH 347 or MATH 348.

Departmental distinction: Distinction will be awarded on the basis of selection of 400-level courses in mathematics and the grade point average. Graduation with High Distinction or Highest Distinction in

Mathematics requires participation in the Program for Distinction in Mathematics or Mathematics Education. Full details are available at the departmental website.

General education: Students must complete the Campus General Education (https://courses.illinois.edu/) **requirements including the campus general education language requirement.**
Minimum required major and supporting course work: normally equates to 46-49 hours including 27-35 hours of mathematics beyond calculus, 3-4 hours of computer science, and 12 hours of supporting coursework. Twelve (12) hours of 300- and 400-level non-S/U-graded courses in the major must be taken on this campus.
Minimum hours required for graduation: 120 hours.

Code	Title	Hours
Required Core Courses		
MATH 241	Calculus III (Students should have credit for MATH 220/MATH 221 and MATH 231 before enrolling in MATH 241.)	4
MATH 347	Fundamental Mathematics	3
MATH 416	Abstract Linear Algebra (Students may not receive credit for both MATH 416 and either ASRM 406 or MATH 415.)	3
MATH 417	Intro to Abstract Algebra	3
or MATH 427	Honors Abstract Algebra	
MATH 424	Honors Real Analysis (If MATH 424 or MATH 447 is completed, a requirement for the Math Doctoral Preparation concentration has been satisfied.)	3
or MATH 444	Elementary Real Analysis	
or MATH 447	Real Variables	
MATH 461	Probability Theory (If STAT 400 is completed, a requirement for the Data Optimization concentration has been satisfied.)	3-4
or STAT 400	Statistics and Probability I	
CS 101	Intro Computing: Engrg & Sci	3-4
or CS 124	Introduction to Computer Science I	
or CS 125	Introduction to Computer Science	
Approved supporting coursework outside Mathematics (Supporting coursework may be completed with 12 advisor-approved hours of a single math-related area outside of MATH/ASRM not used for a major requirement and must include at least one advanced course; ANY minor which is fulfilled with at least 12 hours of courses, including one advanced course, not used for the major nor cross-listed with MATH/ASRM; or any double major or dual degree.)		12
Mathematics Courses		
Select a total of two courses from two of the following three lists:		6
Geometry		
MATH 402	Non Euclidean Geometry	
MATH 403	Euclidean Geometry	
MATH 423	Differential Geometry	
MATH 481	Vector and Tensor Analysis	
Differential Equations and Complex Analysis		
MATH 441	Differential Equations	

MATH 446	Applied Complex Variables	
MATH 448	Complex Variables	
Number Theory		
MATH 453	Number Theory	
Two additional 400-level or approved 500-level mathematics courses. (Coursework awarded S/U grades may not be used to fill this requirement.)		6
Total Hours		**46-48**

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Sample Sequence

This sample sequence is intended to be used only as a guide for degree completion. All students should work individually with their academic advisors to decide the actual course selection and sequence that works best for them based on their academic preparation and goals. Enrichment programming such as study abroad, minors, internships, and so on may impact the structure of this four-year plan. Course availability is not guaranteed during the semester indicated in the sample sequence.

Students must fulfill their Language Other Than English requirement by successfully completing a fourth level of a language other than English. See the corresponding section on the Degree and General Education Requirements page *(http://catalog.illinois.edu/general-information/degree-general-education-requirements/).*

First Year

First Semester	Hours	Second Semester	Hours
Free elective course	1	MATH 231	3
MATH 220 or 221	4	CS 101 (or CS 124 or CS 125)	3
Composition I or General Education course	3	Language Other than English (4th level)	4
Language Other than English (3rd level)	4	General Education course or Composition I	3
General Education course	3	General Education course	3
	15		**16**

Second Year

First Semester	Hours	Second Semester	Hours
MATH 241	4	MATH 347	3
General Education course	3	STAT 400 or MATH 461	4
General Education course	3	General Education course	3
Free elective course	3	General Education course	3
Free elective course	3	Free elective course	3
	16		**16**

Third Year

First Semester	Hours	Second Semester	Hours
MATH 416	3	MATH 444 (or 447 or 424)	3
MATH course from Mathematics Courses list	3	MATH course from Mathematics Courses list	3
General Education course	3	General Education course	3
General Education course	3	Free elective course	3
Supporting Coursework	3	Supporting Coursework	3
	15		**15**

Fourth Year

First Semester	Hours	Second Semester	Hours
MATH 417 or 427	3	400-500 level MATH course	3
400-500 level MATH course	3	Supporting Coursework	3
Supporting Coursework	3	Free elective course	3
Free elective course	3	Free elective course	3
Free elective course	3		
	15		**12**

Total Hours 120

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1. Ability to construct proofs and recognize when proofs are complete.
2. Ability to use theorems in order to solve problems.
3. Technical proficiency in calculus and linear algebra
4. The ability to apply mathematics; translating real-world problems into mathematical problems and solving them.

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Department of Mathematics website (https://math.illinois.edu/)
Department of Mathematics faculty (https://math.illinois.edu/directory/faculty/)
Mathematics Advising (https://math.illinois.edu/academics/undergraduate-program/undergraduate-advising/)
Mathematics Advising email (mathadvising@illinois.edu)

College of Liberal Arts and Sciences website (https://las.illinois.edu/)
Overview of Admissions & Requirements for the College of LAS (http://catalog.illinois.edu/schools/las/academic-units/)