

MATHEMATICS & COMPUTER SCIENCE, BSLAS

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

Undergraduate programs in Mathematics

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

Mathematics, BSLAS (<http://catalog.illinois.edu/undergraduate/las/mathematics-bslas/#text>)

Mathematics & Computer Science, BSLAS (p. 1)

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

Departmental distinction: To graduate with distinction requires a specified minimum grade point average in all Computer Science and Mathematics courses listed below. A GPA of 3.25 is required for Distinction, 3.5 for High Distinction, and 3.75 for Highest Distinction. In addition, students must complete at least three semester hours of additional Computer Science or Mathematics courses selected from the following: CS 196, CS 296, CS 397, CS 492, CS 493, CS 499, any CS course numbered 411 or higher, MATH 412, MATH 414, MATH 417, MATH 418, MATH 423, MATH 432, MATH 448, MATH 482, MATH 484, MATH 496.

NOTE: A student taking a cross-listed course in this major may designate it as either mathematics or computer science.

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 71-75 hours. Twelve hours of 300- and 400-level in the major must be taken on this campus.

Minimum hours required for graduation: 120 hours. Requirements

Code	Title	Hours
CS 100	Computer Science Orientation (recommended)	1
Calculus through MATH 241-Calculus III		11-12
CS 124	Introduction to Computer Science I	3
CS 128	Introduction to Computer Science II	3
MATH 347	Fundamental Mathematics	3
CS 173	Discrete Structures	3
CS 225	Data Structures	4
CS 222	Software Design Lab	1
Choose one of the following combinations		8-11
CS 233 & CS 341	Computer Architecture and System Programming	

OR

CS 340	Introduction to Computer Systems	
& two CS courses at the 400 level above CS 403, excluding CS 421 and CS 491. These two courses must be distinct from all other courses used to fulfill program requirements or options.		
CS/MATH 357	Numerical Methods I	3
CS 374	Introduction to Algorithms & Models of Computation	4
CS 421	Programming Languages & Compilers	3
CS 450	Numerical Analysis	3
MATH 415 or MATH 416	Applied Linear Algebra Abstract Linear Algebra	3
400-level mathematics and computer science requirements: Students must select at least six 400-level mathematics and computer science courses, including one from each of the following groups:		18
GROUP I		
CS 361	Probability & Statistics for Computer Science (recommended)	
MATH 461	Probability Theory	
STAT 400/ MATH 463	Statistics and Probability I	
GROUP II		
MATH 412	Graph Theory	
MATH 413	Intro to Combinatorics	
MATH 417	Intro to Abstract Algebra	
MATH 427	Honors Abstract Algebra	
GROUP III		
MATH 441	Differential Equations	
MATH 446	Applied Complex Variables	
MATH 484	Nonlinear Programming	
GROUP IV		
MATH 424	Honors Real Analysis	
MATH 444	Elementary Real Analysis	
MATH 447	Real Variables	
GROUP V		
MATH 414	Mathematical Logic	
CS/MATH 473	Algorithms	
CS/MATH 475	Formal Models of Computation	
CS 476	Program Verification	
CS 477	Formal Software Development Methods	
Total Hours		71-75

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

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
CS 100	1	MATH 231	3
MATH 220 or 221	4	CS 128	3
General Education course	3	CS 173	3
Composition I or General Education course	4	General Education course or Composition I	3
CS 124	3	General Education course	3
	15		15

Second Year

First Semester	Hours	Second Semester	Hours
MATH 241	4	MATH 347	3
CS 225	4	MATH 415 or 416	3
CS 222	1	CS 233 or 340	3
Language Other Than English (3rd level)	4	Language Other Than English (4th level)	4
General Education course	3	Free elective course	2
	16		15

Third Year

First Semester	Hours	Second Semester	Hours
CS 361 (or MATH 461 or STAT 400)	3	CS 374	4
CS 341 (or CS 4xx (if CS 340 was chosen))	4	CS 357	3
MATH 441 (or MATH 446 or MATH 484)	3	MATH 444 (or MATH 447 or MATH 424)	3
General Education course	3	General Education course	3
General Education course	3	Free elective course	2
	16		15

Fourth Year

First Semester	Hours	Second Semester	Hours
CS 450	3	CS 473 (or CS 475 or CS 476 or CS 477 or MATH 414)	4
CS 421	3	Additional 400-level MATH or CS course from Groups I-V	3

MATH 412 (or MATH 413 or MATH 417 or MATH 427)	3 General Education course	3
General Education course	3 Free elective course or CS 4xx (if CS 340 was chosen)	3
General Education course	3	
	15	13

Total Hours 120

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

By the time of graduation, students will have the ability to:

Computer Science:

1. Analyze a complex computing problem and apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Mathematics:

1. Construct proofs and recognize when proofs are complete
2. Use theorems in order to solve problems
3. Demonstrate technical proficiency in calculus and linear algebra

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

Mathematics & Computer Science

Mathematics & Computer Science: Math website (<https://math.illinois.edu/academics/undergraduate-program-mathematics/>)
Mathematics & Computer Science: Computer Science website (<https://cs.illinois.edu/academics/undergraduate/degree-program-options/bs-mathematics-computer-science/>)

Mathematics Department website (<https://math.illinois.edu/>)
Mathematics faculty (<https://math.illinois.edu/directory/faculty/>)

Overview of LAS Admissions & Requirements (<http://catalog.illinois.edu/schools/las/academic-units/>)

College of Liberal Arts and Sciences website (<https://las.illinois.edu/>)

The Grainger College of Engineering website (<https://grainger.illinois.edu>)

Math email (mathadvising@illinois.edu)

Computer Science email (undergrad@cs.illinois.edu)