

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 and 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 or MATH 348	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:		18
Students must select at least six 400-level mathematics and computer science courses, including one from each of the following groups:		
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

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By the time of graduation, students will have:

Computer Science:

1. An ability to apply knowledge of computing and mathematics appropriate to the discipline
2. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
3. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs

4. An ability to function effectively on teams to accomplish a common goal
5. An understanding of professional, ethical, legal, security and social issues and responsibilities
6. An ability to communicate effectively with a range of audiences
7. An ability to analyze the local and global impact of computing on individuals, organizations, and society
8. A recognition of the need for and an ability to engage in continuing professional development
9. An ability to use current techniques, skills, and tools necessary for computing practice
10. An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the trade-offs involved in design choices
11. An ability to apply design and development principles in the construction of software systems of varying complexity

Mathematics:

1. An ability to construct proofs and recognize when proofs are complete
2. An ability to use theorems in order to solve problems
3. Technical proficiency in calculus and linear algebra

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math website: Mathematics & Computer Science (<https://math.illinois.edu/academics/undergraduate-program-mathematics/>)

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

department website: Mathematics (<https://math.illinois.edu/>)

department faculty: Mathematics Faculty (<https://math.illinois.edu/directory/faculty/>)

overview of college admissions & requirements: Liberal Arts & Sciences (<http://catalog.illinois.edu/schools/las/academic-units/>)

college websites: <https://las.illinois.edu/> **and** <https://grainger.illinois.edu/> (<https://grainger.illinois.edu/>)

math email: mathadvising@illinois.edu

computer science email: undergrad@cs.illinois.edu (academic@cs.illinois.edu)