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 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

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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<tbody>
<tr>
<td>CS 100</td>
<td>Computer Science Orientation (recommended)</td>
<td>1</td>
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<tr>
<td></td>
<td>Calculus through MATH 241-Calculus III</td>
<td>11-12</td>
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<tr>
<td>CS 124</td>
<td>Introduction to Computer Science I</td>
<td>3</td>
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<tr>
<td>CS 128</td>
<td>Introduction to Computer Science II</td>
<td>3</td>
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<tr>
<td>MATH 347</td>
<td>Fundamental Mathematics</td>
<td>3</td>
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<td></td>
<td>or MATH 348</td>
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<tr>
<td>CS 173</td>
<td>Discrete Structures</td>
<td>3</td>
</tr>
<tr>
<td>CS 225</td>
<td>Data Structures</td>
<td>4</td>
</tr>
<tr>
<td>CS 222</td>
<td>Software Design Lab</td>
<td>1</td>
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<tr>
<td>Choose one of the following combinations</td>
<td>8-11</td>
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<tr>
<td>CS 233</td>
<td>Computer Architecture</td>
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<td>&amp; CS 341</td>
<td>and System Programming</td>
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<td>OR</td>
<td>CS 340</td>
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<td></td>
<td>Introduction to Computer Systems</td>
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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  Applied Linear Algebra  3
or MATH 416  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)  3
MATH 461  Probability Theory  3
STAT 400/ MATH 463  Statistics and Probability I  3

GROUP II
MATH 412  Graph Theory  3
MATH 413  Intro to Combinatorics  3
MATH 417  Intro to Abstract Algebra  3
MATH 427  Honors Abstract Algebra  3

GROUP III
MATH 441  Differential Equations  3
MATH 446  Applied Complex Variables  3
MATH 484  Nonlinear Programming  3

GROUP IV
MATH 424  Honors Real Analysis  3
MATH 444  Elementary Real Analysis  3
MATH 447  Real Variables  3

GROUP V
MATH 414  Mathematical Logic  3
CS/MATH 473  Algorithms  3
CS/MATH 475  Formal Models of Computation  3
CS 476  Program Verification  3
CS 477  Formal Software Development Methods  3

Total Hours  71-75

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

Information listed in this catalog is current as of 07/2023
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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**Mathematics 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)