COMPUTER SCIENCE + ASTRONOMY, BSLAS

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

A Major Plan of Study Form must be completed and submitted to the LAS Student Affairs Office by the beginning of the fifth semester (60-75 hours). Please see the computer science advisor as well as the astronomy advisor.

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 coursework: Normally equates to 68-71 hours. Twelve hours of 300- and 400-level in the major must be taken on this campus.

A Major Plan of Study form must be completed and submitted to the LAS Student Affairs office by the beginning of the fifth semester (60-75 hours). Please see the Computer Science advisor as well as the Astronomy advisor.

Minimum hours required for graduation: 120 hours.

<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</td>
<td>1</td>
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<td></td>
<td>(recommended; CS 100 is an orientation course aimed at first-year students, so students who declare the major after the freshman year are not required to complete it.)</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>CS 173</td>
<td>Discrete Structures</td>
<td>3</td>
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<tr>
<td>CS 225</td>
<td>Data Structures</td>
<td>4</td>
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<tr>
<td>CS 222</td>
<td>Software Design Lab</td>
<td>1</td>
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<td>Choose one of the following combinations</td>
<td>8-11</td>
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<tr>
<td>CS 233 &amp; CS 341</td>
<td>Computer Architecture &amp; System Programming</td>
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<td>OR</td>
<td>CS 340</td>
<td>Introduction to Computer Systems</td>
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<tr>
<td>&amp; two CS courses at the 400 level above CS 403, excluding CS 421 and CS 491</td>
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<tr>
<td>Choose one of the following:</td>
<td>3</td>
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<tr>
<td>STAT 200</td>
<td>Statistical Analysis</td>
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<tr>
<td>STAT 212</td>
<td>Biostatistics</td>
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<tr>
<td>CS 361</td>
<td>Probability &amp; Statistics for Computer Science</td>
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<tr>
<td>CS 374</td>
<td>Introduction to Algorithms &amp; Models of Computation</td>
<td>4</td>
</tr>
<tr>
<td>CS 421</td>
<td>Programming Languages &amp; Compilers</td>
<td>3</td>
</tr>
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</table>

Mathematics (may also fulfill the General Education Quantitative Reasoning I and II requirements)

MATH 221 Calculus I
or MATH 220 Calculus
MATH 225 Introductory Matrix Theory
or MATH 257 Linear Algebra with Computational Applications
MATH 231 Calculus II

Required Astronomy Coursework - Minimum of 27 Hours

Physics, Mathematics, and Astronomy Foundations 15
PHYS 211 University Physics: Mechanics 4
PHYS 212 University Physics: Elec & Mag 4
MATH 241 Calculus III 4
ASTR 210 Introduction to Astrophysics 3

Advanced Astronomy Courses (Minimum 12 total advanced ASTR hours required)

ASTR 310 Computing in Astronomy 3
Select 2 courses from the following list: 6-7
ASTR 404 Stellar Astrophysics
ASTR 405 Planetary Systems
ASTR 406 Galaxies and the Universe
ASTR 414 Astronomical Techniques

Additional ASTR course(s) at the 300 level or higher 2-3

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Undergraduate Computer Science & Astronomy majors will graduate with a demonstrated ability to:

LO1. Understand the hierarchical architecture of the cosmos, increasing in scale from the Solar System to the Galaxy to the Universe, and decreasing in scale to atoms and their nuclei. Understand the interplay among these scales.

LO2. Define and use fundamental principles and techniques of astronomy and astrophysics.

- Identify which principles should be applied to a specified situation
- Show familiarity with astronomical observables and their physical origin.
- Understand and apply basic physics and computational techniques to solve problems in astrophysics, and interpret the results.

LO3. Analyze astronomical data, and quantitative data generally.

- Demonstrate the ability to link observation and theory.
- Demonstrate the ability to draw qualitative conclusions from quantitative information, and vice versa.
- Demonstrate the ability to plan observational programs, use astronomical telescopes and instrumentation, and to analyze and present astronomical data.

LO4. Plan and perform guided research, or attain an advanced-level understanding of a topic of contemporary interest in astronomy and astrophysics.

LO5. Demonstrate the ability to communicate effectively both verbally and in writing.
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**computer science website:** CS + X Degrees (https://cs.illinois.edu/academics/undergraduate/degree-program-options/cs-x-degree-programs/#requirements)

**astronomy website:** CS + Astronomy (https://astro.illinois.edu/academics/undergraduate-program/computer-science-astronomy-major/)

**department page:** https://astro.illinois.edu/

**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/)

**astronomy email:** astronomy@illinois.edu

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