COMPUTER SCIENCE + ASTRONOMY, BSLAS

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

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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 course work: 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>
</tr>
</thead>
<tbody>
<tr>
<td>CS 100</td>
<td>Computer Science Orientation (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>
<td>1</td>
</tr>
<tr>
<td>CS 124</td>
<td>Introduction to Computer Science I</td>
<td>3</td>
</tr>
<tr>
<td>CS 128</td>
<td>Introduction to Computer Science II</td>
<td>3</td>
</tr>
<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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</tbody>
</table>

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

Choose one of the following: 3

- STAT 200
- STAT 212

Statistical Analysis

Biostatistics

- CS 361

Probability & Statistics for Computer Science

- CS 374

Introduction to Algorithms & Models of Computation

- CS 421

Programming Languages & Compilers

3

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

- MATH 221
- or MATH 220

Calculus I

Calculus

4-5

- MATH 225
- or MATH 257

Introductory Matrix Theory

Linear Algebra with Computational Applications

2 or 3

- MATH 231

Calculus II

3

Required Astronomy Coursework - Minimum of 27 Hours

Physics, Mathematics, and Astronomy Foundations

- 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) 12-13

- ASTR 310

Computing in Astronomy

3

Select 2 courses from the following list: 6-7

Information listed in this catalog is current as of 12/2022
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASTR 404</td>
<td>Stellar Astrophysics</td>
</tr>
<tr>
<td>ASTR 405</td>
<td>Planetary Systems</td>
</tr>
<tr>
<td>ASTR 406</td>
<td>Galaxies and the Universe</td>
</tr>
<tr>
<td>ASTR 414</td>
<td>Astronomical Techniques</td>
</tr>
</tbody>
</table>

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)

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