### COMPUTER SCIENCE SECOND MAJOR FOR ISP STUDENTS

Students must also complete the Undergraduate Registration Requirement (https://catalogs.northwestern.edu/undergraduate/requirements-policies/undergraduate-registration-requirement/) and the degree requirements of their home school.

The Integrated Science Program is a highly selective program in Weinberg College. Weinberg College students, but not McCormick students, majoring in Integrated Science may complete an abbreviated, adjunct major in computer science through a curriculum tailored specifically to their needs:

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP_SCI 111-0</td>
<td>Fundamentals of Computer Programming</td>
</tr>
<tr>
<td>COMP_SCI 150-0</td>
<td>Fundamentals of Computer Programming I.5</td>
</tr>
<tr>
<td>COMP_SCI 211-0</td>
<td>Fundamentals of Computer Programming II</td>
</tr>
<tr>
<td>COMP_SCI 212-0</td>
<td>Mathematical Foundations of Comp Science</td>
</tr>
<tr>
<td>COMP_SCI 213-0</td>
<td>Introduction to Computer Systems</td>
</tr>
<tr>
<td>COMP_SCI 214-0</td>
<td>Data Structures &amp; Algorithms</td>
</tr>
</tbody>
</table>

**Breadth courses (same as for stand-alone major: 5 courses, one from each area, see below)**

**Project courses (2 units; projects must be approved by both ISP and CS advisers)**

- COMP_SCI 399-0 Projects
- or INTG_SCI 398-0 Undergraduate Research

### Breadth Courses

Majors must take one course from each area. Minors must take one course from each of any three areas.

#### Theory

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>COMP_SCI 335-0</td>
<td>Introduction to the Theory of Computation</td>
</tr>
<tr>
<td>COMP_SCI 336-0</td>
<td>Design &amp; Analysis of Algorithms</td>
</tr>
</tbody>
</table>

#### Systems

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>COMP_SCI 322-0</td>
<td>Compiler Construction</td>
</tr>
<tr>
<td>COMP_SCI 339-0</td>
<td>Introduction to Database Systems</td>
</tr>
<tr>
<td>COMP_SCI 340-0</td>
<td>Introduction to Networking</td>
</tr>
<tr>
<td>COMP_SCI 343-0</td>
<td>Operating Systems</td>
</tr>
<tr>
<td>COMP_SCI 345-0</td>
<td>Distributed Systems</td>
</tr>
<tr>
<td>COMP_SCI 350-0</td>
<td>Introduction to Computer Security</td>
</tr>
<tr>
<td>COMP_SCI 354-0</td>
<td>Computer System Security</td>
</tr>
<tr>
<td>COMP_SCI 440-0</td>
<td>Advanced Networking</td>
</tr>
<tr>
<td>COMP_SCI 441-0</td>
<td>Resource Virtualization</td>
</tr>
<tr>
<td>COMP_SCI 443-0</td>
<td>Advanced Operating Systems</td>
</tr>
<tr>
<td>COMP_SCI 446-0</td>
<td>Kernel and Other Low-level Software Development</td>
</tr>
<tr>
<td>COMP_SCI 450-0</td>
<td>Internet Security</td>
</tr>
<tr>
<td>COMP_ENG 303-0</td>
<td>Advanced Digital Design</td>
</tr>
<tr>
<td>COMP_ENG 346-0</td>
<td>Microprocessor System Design</td>
</tr>
<tr>
<td>COMP_ENG 358-0</td>
<td>Introduction to Parallel Computing</td>
</tr>
<tr>
<td>COMP_ENG 361-0</td>
<td>Computer Architecture I</td>
</tr>
</tbody>
</table>

#### Artificial Intelligence

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP_SCI 325-1</td>
<td>Artificial Intelligence Programming</td>
</tr>
<tr>
<td>COMP_SCI 337-0</td>
<td>Natural Language Processing</td>
</tr>
<tr>
<td>COMP_SCI 344-0</td>
<td>Design of Computer Problem Solvers</td>
</tr>
<tr>
<td>COMP_SCI 348-0</td>
<td>Introduction to Artificial Intelligence</td>
</tr>
<tr>
<td>COMP_SCI 349-0</td>
<td>Machine Learning</td>
</tr>
<tr>
<td>COMP_SCI 371-0</td>
<td>Knowledge Representation and Reasoning</td>
</tr>
<tr>
<td>COMP_SCI 372-0</td>
<td>Designing and Constructing Models with Multi-Agent Languages</td>
</tr>
</tbody>
</table>

#### Interfaces

<table>
<thead>
<tr>
<th>Course</th>
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</thead>
<tbody>
<tr>
<td>COMP_SCI 329-0</td>
<td>HCI Studio</td>
</tr>
<tr>
<td>COMP_SCI 331-0</td>
<td>Tangible Interaction Design and Learning</td>
</tr>
<tr>
<td>COMP_SCI 315-0</td>
<td>Design, Technology, and Research</td>
</tr>
<tr>
<td>COMP_SCI 330-0</td>
<td>Human Computer Interaction</td>
</tr>
<tr>
<td>COMP_SCI 331-0</td>
<td>Introduction to Computational Photography</td>
</tr>
<tr>
<td>COMP_SCI 333-0</td>
<td>Interactive Information Visualization</td>
</tr>
<tr>
<td>COMP_SCI 351-0</td>
<td>Introduction to Computer Graphics</td>
</tr>
<tr>
<td>COMP_SCI 352-0</td>
<td>Machine Perception of Music &amp; Audio</td>
</tr>
<tr>
<td>COMP_SCI 370-0</td>
<td>Computer Game Design</td>
</tr>
<tr>
<td>COMP_SCI 372-0</td>
<td>Designing and Constructing Models with Multi-Agent Languages</td>
</tr>
<tr>
<td>COMP_SCI 376-0</td>
<td>Computer Game Design and Development</td>
</tr>
<tr>
<td>COMP_SCI 377-0</td>
<td>Game Design Studio</td>
</tr>
<tr>
<td>ELEC_ENG 332-0</td>
<td>Introduction to Computer Vision</td>
</tr>
</tbody>
</table>

#### Software Development and Programming Languages

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>COMP_SCI 310-0</td>
<td>Scalable Software Architectures</td>
</tr>
<tr>
<td>COMP_SCI 321-0</td>
<td>Programming Languages</td>
</tr>
<tr>
<td>COMP_SCI 338-0</td>
<td>Practicum in Intelligent Information Systems</td>
</tr>
<tr>
<td>COMP_SCI 377-0</td>
<td>Game Design Studio</td>
</tr>
<tr>
<td>COMP_SCI 393-0</td>
<td>Software Construction</td>
</tr>
<tr>
<td>COMP_SCI 394-0</td>
<td>Agile Software Development</td>
</tr>
<tr>
<td>COMP_SCI 473-1</td>
<td>NUvention: Web - Part 1</td>
</tr>
<tr>
<td>COMP_SCI 473-2</td>
<td>NUvention: Web - Part 2</td>
</tr>
</tbody>
</table>