Regardless of your major, you can enhance your career with a background in computer sciences. The computer sciences certificate is designed to deepen and validate your computing savvy for your future career prospects and/or graduate school. Compared to a major in computer sciences, the certificate requires fewer courses and offers more flexibility in course selection.

HOW TO GET IN

All undergraduate, degree-seeking students are eligible to declare the computer sciences certificate, except for students majoring in computer sciences, and electrical or computer engineering.

Information on declaring the certificate is available on the Department of Computer Sciences advising pages (http://www.cs.wisc.edu/advising).

REQUIREMENTS

REQUIREMENTS FOR THE CERTIFICATE

REQUICKED COURSEWORK

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP SCI 300</td>
<td>Programming II (Comp Sci 367 may also be used if completed prior to Summer 2018.)</td>
<td></td>
</tr>
<tr>
<td>At least two COMP SCI courses at the 400 level or higher, selected from the course list below.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Two additional COMP SCI courses, at any level, selected from the course list below.</td>
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</tr>
</tbody>
</table>

Courses taken on a pass/fail basis may not be used toward the certificate.

COURSE LIST

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP SCI/ MATH 240</td>
<td>Introduction to Discrete Mathematics</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/E C E 252</td>
<td>Introduction to Computer Engineering</td>
<td>2</td>
</tr>
<tr>
<td>COMP SCI 270</td>
<td>Fundamentals of Human-Computer Interaction</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 310</td>
<td>Problem Solving Using Computers</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/E C E 352</td>
<td>Digital System Fundamentals</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI/E C E 354</td>
<td>Machine Organization and Programming</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 369</td>
<td>Web Programming</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 400</td>
<td>Programming III</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 407</td>
<td>Foundations of Mobile Systems and Applications</td>
<td>3</td>
</tr>
<tr>
<td>COMP SCI 412</td>
<td>Introduction to Numerical Methods</td>
<td>3</td>
</tr>
</tbody>
</table>

**COMP SCI/I SY E/MATH 425** | Introduction to Combinatorial Optimization | 3
**COMP SCI/E C E/MATH 435** | Introduction to Cryptography | 3
**COMP SCI/STAT 471** | Introduction to Computational Statistics | 3
**COMP SCI/MATH/STAT 475** | Introduction to Combinatorics | 3
**COMP SCI/E C E 506** | Software Engineering | 3
**COMP SCI/E C MATH 513** | Numerical Linear Algebra | 3
**COMP SCI/E C MATH 514** | Numerical Analysis | 3
**COMP SCI 520** | Introduction to Theory of Computing | 3
**COMP SCI/E C E/I SY E 524** | Introduction to Optimization | 3
**COMP SCI/I SY E/MATH/STAT 525** | Linear Programming Methods | 3
**COMP SCI/I SY E 526** | Advanced Linear Programming | 3-4
**COMP SCI/E C E/M 532** | Matrix Methods in Machine Learning | 3
**COMP SCI 534** | Computational Photography | 3
**COMP SCI 536** | Introduction to Programming Languages and Compilers | 3
**COMP SCI 537** | Introduction to Operating Systems | 4
**COMP SCI 538** | Introduction to the Theory and Design of Programming Languages | 3
**COMP SCI/E C E/M E 539** | Introduction to Artificial Neural Network and Fuzzy Systems | 3
**COMP SCI 540** | Introduction to Artificial Intelligence | 3
**COMP SCI 545** | Natural Language and Computing | 3
**COMP SCI 547** | Computer Systems Modeling Fundamentals | 3
**COMP SCI/E C E 552** | Introduction to Computer Architecture | 3
**COMP SCI/I SY E/M E 558** | Introduction to Computational Geometry | 3
**COMP SCI 559** | Computer Graphics | 3
**COMP SCI 564** | Database Management Systems: Design and Implementation | 4
**COMP SCI/B M I 567** | Medical Image Analysis | 3
**COMP SCI 570** | Introduction to Human-Computer Interaction | 4
**COMP SCI/B M I 576** | Introduction to Bioinformatics | 3
**COMP SCI 577** | Introduction to Algorithms | 4
**COMP SCI/DS 579** | Virtual Reality | 3
**COMP SCI/I SY E 635** | Tools and Environments for Optimization | 3
**COMP SCI 640** | Introduction to Computer Networks | 3
**COMP SCI 642** | Introduction to Information Security | 3
**COMP SCI 679** | Computer Game Technology | 3
COMP SCI 639  Undergraduate Elective Topics in Computing  3-4

RESIDENCE AND QUALITY OF WORK

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A 2.000 GPA must be earned on all courses meeting certificate requirements. Students may complete no more than two courses toward the certificate post-baccalaureate as a University Special student. Courses taken post-baccalaureate as a University Special student must be completed within three regular academic semesters from the time of degree award (excluding summer) in order to be used toward the certificate. For students who complete the certificate while enrolled in an undergraduate degree-seeking program, at least 7 credits must be completed in residence. For students who complete the certificate post-baccalaureate as a University Special student, at least 12 credits must be completed in residence.</td>
<td></td>
</tr>
</tbody>
</table>

UNDERGRADUATE/SPECIAL STUDENT CERTIFICATE

This certificate may be completed within the context of an undergraduate degree or as a Special student after an undergraduate degree has been awarded from any institution. The certificate may be completed in its entirety while enrolled as a Special student. Candidates are encouraged to contact the certificate coordinator to discuss course enrollment and the sequencing of certificate requirements.

LEARNING OUTCOMES

1. Recognize and apply the core principles of Computing (abstractions and algorithms) to solve real-world problems.

2. Use fundamental and detailed knowledge, skills, and tools (e.g., specific algorithms, techniques methods, etc.) of computer science and develop the ability to acquire new knowledge, skills, and tools.

3. Design, implement, and evaluate software in multiple programming paradigms and languages.

4. Can solve problems by applying a broad toolbox of knowledge and techniques.

ADVISING AND CAREERS

ADVISING

The undergraduate coordinators in the Department of Computer Sciences are ready to help students with questions about the major, L&S degree requirements and policy, and course selection. Information on academic advising for students interested or declared in the Computer Students major is posted to the Computer Sciences advising page (https://www.cs.wisc.edu/advisors).