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, Electrical Engineering and/or Computer Engineering.

DECLARATION REQUIREMENTS

To declare the computer sciences certificate, students must meet the following requirements:

- Completion of COMP SCI 300
- Grade of BC or higher in one of these introductory programming course, taken at UW-Madison: COMP SCI 300, COMP SCI/ECE 354 or COMP SCI 400

Students having difficulties meeting the above requirements should schedule a meeting with a computer sciences advisor to discuss alternatives.

For instructions on declaring the certificate, see the Department of Computer Sciences website (https://www.cs.wisc.edu/undergraduate/certificate-in-computer-sciences/).

REQUIREMENTS

REQUIREMENTS FOR THE CERTIFICATE

Five courses and at least 14 credits from: 1

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>COMP SCI 300</td>
<td>Programming II</td>
<td>3</td>
</tr>
<tr>
<td>Two courses numbered 400-679:</td>
<td></td>
<td>6-8</td>
</tr>
<tr>
<td>COMP SCI 400</td>
<td>Programming III</td>
<td></td>
</tr>
<tr>
<td>COMP SCI 407</td>
<td>Foundations of Mobile Systems and Applications</td>
<td></td>
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<tr>
<td>COMP SCI 412</td>
<td>Introduction to Numerical Methods</td>
<td></td>
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<tr>
<td>COMP SCI/I SYE/MATH 425</td>
<td>Introduction to Combinatorial Optimization</td>
<td></td>
</tr>
<tr>
<td>COMP SCI/ECE/MATH 435</td>
<td>Introduction to Cryptography</td>
<td></td>
</tr>
<tr>
<td>COMP SCI/STAT 471</td>
<td>Introduction to Computational Statistics</td>
<td></td>
</tr>
<tr>
<td>COMP SCI/MATH/STAT 475</td>
<td>Introduction to Combinatorics</td>
<td></td>
</tr>
</tbody>
</table>

COMP SCI/ECE 506 Software Engineering
COMP SCI/MATH 513 Numerical Linear Algebra
COMP SCI/MATH 514 Numerical Analysis
COMP SCI 520 Introduction to Theory of Computing
COMP SCI/ECE/I SYE 524 Introduction to Optimization
COMP SCI/I SYE/MATH/STAT 525 Linear Optimization
COMP SCI 526 Advanced Linear Programming
COMP SCI/ECE 532 Matrix Methods in Machine Learning
COMP SCI/I SYE 533 Image Processing
COMP SCI 534 Computational Photography
COMP SCI 536 Introduction to Programming Languages and Compilers
COMP SCI 537 Introduction to Operating Systems
COMP SCI 538 Introduction to the Theory and Design of Programming Languages
COMP SCI/ECE/MATH 539 Introduction to Artificial Neural Networks
COMP SCI 540 Introduction to Artificial Intelligence
COMP SCI 545 Natural Language and Computing
COMP SCI 547 Computer Systems Modeling Fundamentals
COMP SCI/ECE 552 Introduction to Computer Architecture
COMP SCI/I SYE/MATH 558 Introduction to Computational Geometry
COMP SCI 559 Computer Graphics
COMP SCI 564 Database Management Systems: Design and Implementation
COMP SCI/BMI 567 Medical Image Analysis
COMP SCI 570 Introduction to Human-Computer Interaction
COMP SCI/BMI 576 Introduction to Bioinformatics
COMP SCI 577 Introduction to Algorithms
COMP SCI/DS 579 Virtual Reality
COMP SCI/I SYE 635 Tools and Environments for Optimization
COMP SCI 640 Introduction to Computer Networks
COMP SCI 642 Introduction to Information Security
COMP SCI 639 Undergraduate Elective Topics in Computing
COMP SCI 679 Computer Game Technology

Two additional courses, chosen from courses numbered 400-679 (above) or these: 5-8
COMP SCI/MATH 240  Introduction to Discrete Mathematics
COMP SCI/ECE 252  Introduction to Computer Engineering
COMP SCI 270  Fundamentals of Human-Computer Interaction
COMP SCI/ECE 352  Digital System Fundamentals
COMP SCI 310  Problem Solving Using Computers
COMP SCI 320  Data Programming II
COMP SCI/ECE 354  Machine Organization and Programming
COMP SCI 369  Web Programming

Total Credits  14

1. Courses taken Pass/Fail do not meet requirements of the Certificate.

RESIDENCE AND QUALITY OF WORK
- At least 7 Certificate credits must be completed in Residence
- Minimum 2.000 GPA on all COMP SCI and Certificate courses

UNDERGRADUATE/SPECIAL STUDENT CERTIFICATE
This certificate is intended to be completed in the context of an undergraduate degree and for those seeking this certificate that is preferred. For students who have substantially completed this certificate at UW-Madison (at least 12 credits) and may need one or two courses to complete the certificate, they may do so immediately after completion of the bachelor’s degree by enrolling in the course as a University Special (nondegree) student. The certificate must be completed within a year of completion of the bachelor’s degree. Students should keep in mind that University Special students have the last registration priority and that may limit availability of desired courses. Financial aid is not available when enrolled as a University Special student to complete an undergraduate certificate.

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 in declared in the computer sciences major is posted to the Computer Sciences advising page (https://www.cs.wisc.edu/undergraduate/undergraduate-advisors/).

PEOPLE
Associate Professors Akella, Chawla, Liblit, Mutlu, Sankaralingam, Swift
Assistant Professors Albarghouthi, D’Antoni, Gupta, Koutris, Sifakis
Faculty Associates Dahl, Deppeler, Hasti, Legault, Lewis-Williams, Skrentny, Williams