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](https://www.cs.wisc.edu/undergraduate/certificate-in-computer-sciences)).

**REQUIREMENTS**

**REQUIREMENTS FOR THE CERTIFICATE**

Five courses and at least 12 credits from:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>COMP SCI 300</td>
<td>Programming II</td>
<td>3</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>
</tr>
<tr>
<td>COMP SCI 412</td>
<td>Introduction to Numerical Methods</td>
<td></td>
</tr>
<tr>
<td>COMP SCI/I SY E/MATH 425</td>
<td>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>

Two courses numbered 400-679: 6-8

- COMP SCI 506 Software Engineering
- COMP SCI 513 Numerical Linear Algebra
- COMP SCI 514 Numerical Analysis
- COMP SCI 520 Introduction to Theory of Computing
- COMP SCI/ECE/I SY E/MATH/STAT 524 Introduction to Optimization
- COMP SCI/I SY E/MATH/STAT 525 Linear Optimization
- COMP SCI/I SY E 526 Advanced Linear Programming
- COMP SCI/ECE/MATH 532 Matrix Methods in Machine Learning
- COMP SCI/ECE 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 Network and Fuzzy Systems
- 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 SY E/MATH/STAT 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 SY E 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

Electives from courses numbered 400-679 (above), or these:
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/ECE 354  Machine Organization and Programming
COMP SCI 369  Web Programming

Total Credits  12-14

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 or 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