COMPUTER SCIENCES, CERTIFICATE

REQUIREMENTS

REQUIREMENTS FOR THE CERTIFICATE

Five courses and at least 14 credits from: [1]

Code	Title	Credits
COMP SCI 300	Programming II	3
Two courses numbered 400-679:		**6-8**
COMP SCI 400	Programming III	
COMP SCI 407	Foundations of Mobile Systems and Applications	
COMP SCI 412	Introduction to Numerical Methods	
COMP SCI/I SY E/ MATH 425	Introduction to Combinatorial Optimization	
COMP SCI/E C E/ MATH 435	Introduction to Cryptography	
COMP SCI/ STAT 471	Introduction to Computational Statistics	
COMP SCI/ MATH/STAT 475	Introduction to Combinatorics	
COMP SCI/ E C E 506	Software Engineering	
COMP SCI/ MATH 513	Numerical Linear Algebra	
COMP SCI/ MATH 514	Numerical Analysis	
COMP SCI/DS/ I SY E 518	Wearable Technology	
COMP SCI 520	Introduction to Theory of Computing	
COMP SCI/E C E/ I SY E 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/E C E/ M E 532	Matrix Methods in Machine Learning	
COMP SCI/ E C E 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/E C E/ M E 539	Introduction to Artificial Neural Networks	
COMP SCI 540	Introduction to Artificial Intelligence	
COMP SCI 542	Introduction to Software Security	
COMP SCI 544	Introduction to Big Data Systems	
COMP SCI 545	Natural Language and Computing	
COMP SCI/ E C E 552	Introduction to Computer Architecture	
COMP SCI/I SY E/ M E 558	Introduction to Computational Geometry	
COMP SCI 559	Computer Graphics	
COMP SCI/ E C E 561	Probability and Information Theory in Machine Learning	
COMP SCI 564	Database Management Systems: Design and Implementation	
COMP SCI 566	Introduction to Computer Vision	
COMP SCI/ B M I 567	Medical Image Analysis	
COMP SCI 570	Introduction to Human-Computer Interaction	
COMP SCI 571	Building User Interfaces	
COMP SCI/ B M I 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	
Two additional courses, chosen from courses numbered 400-679 (above) or these:		**5-8**
COMP SCI/ MATH 240	Introduction to Discrete Mathematics	
COMP SCI/ E C E 252	Introduction to Computer Engineering	
COMP SCI 270	Fundamentals of Human-Computer Interaction	
COMP SCI/ E C E 352	Digital System Fundamentals	
COMP SCI 310	Problem Solving Using Computers	
COMP SCI 320	Data Science Programming II	
COMP SCI/ E C E 354	Machine Organization and 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 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.