

Computer Science - Certificate of Achievement

**Description**

Graduates of the two-year Certificate of Achievement program in Computer Science will have the skills required for entry level employment in Software Development, Cybersecurity, or DevOps occupations. The Certificate of Achievement is the recommended program for students who already hold a baccalaureate or higher degree. It prepares students for further study in Computer Science as well as related areas such as Computer Engineering. The curriculum includes instruction in the fundamentals of problem solving and analysis, programming, data structures, and architecture. Additional requirements include Calculus, Physics and Discrete Mathematics. This program takes a contextualized approach to Computer Science through the choice of language, C++, and electives that can be aligned to facilitate High Performance Computing (HPC). It aims to develop skills in the design and implementation of software that operates correctly at extreme scale while leveraging emerging technologies in different industries.

This certificate program may require additional semesters depending on chosen electives. Completion of an elective sequence is not required to receive this certificate. The optional restricted electives prepare Computer Science graduates to enter specific software development workforce sectors and earn a corresponding salary premium. The Cybersecurity courses are part of state approved A.S. Degree and Certificate of Achievement programs and have been demonstrated to confer desirable workforce skills which command higher compensation when combined with the Computer Science software development skill set.

Students who are interested in continuing their studies after completion of the two-year certificate should consult with the departmental chair, read the “Transfer Information” section of the college catalog, and discuss their plans with their program advisor or counselor. If you wish to substitute one class for another because of specific requirements of the transfer institution you will attend, consult with your counselor. Four-year universities may have additional or different course requirements for completion of lower division courses. The website [www.assist.org](http://www.assist.org) can provide additional information about applicable courses for transfer.

**Required Major Courses**

**Units:** 31.0-32.0

CIS 006	Introduction to Computer Programming
OR	
CIS 007	Control Structures and Objects
CIS 011	Discrete Structures and Logic
CIS 033	Software Architectures and Algorithms
CIS 078	Digital Architectures for Computation
MATH 003A	Calculus I
MATH 003B	Calculus II
PHYS 004A	General Physics with Calculus

MATH 011 accepted as a substitute for CIS 011

**Optional Restricted Electives**

**Units:**

Select one group of Optional Restricted Electives from the list below:

**Group A: Cybersecurity - Secure Software Development** **Units: 0.0**

CIS 071	Introduction to Information Systems Security	
CIS 059	Applications in Information Security	
CIS 056	Secure Coding in Java and .NET	
CIS 057	Web Application PEN Testing	

**Group B: Cybersecurity - DevOps (Dev/Sec/Ops)** **Units: 0.0**

CIS 055	Hacker Techniques, Exploits & Incident Handling	
CIS 060	Computer Forensics Fundamentals	
CIS 247	Information Systems Skills Challenge	1.0
CIS 052	Cloud Security Fundamentals	
CIS 053	Intrusion Detection In-Depth: Compliance, Security, Forensics and Troubleshooting	
CIS 178	Build Automation for DevOps & QA	

**Group C: Blockchain Services and Mobile Applications** **Units: 0.0**

CIS 066	XML Documents and Applications	2.0
CIS 093	Cross Platform Mobile Application Development	
CIS 100	Introduction to Blockchain, Cryptocurrencies, and Identity	
CS 043	High Performance Web Applications and Services	

**Group D: DevOps - Software Engineering Automation and Continuous Integration** **Units: 0.0**

CIS 051	Introduction to Information Technology Project Management	
CS 020	Python Application Programming	
CS 080	Software Engineering	
CIS 178	Build Automation for DevOps & QA	
CIS 179	Agile Software Management and Project Automation	

**Group E: High Performance Computing (HPC), Data Science, and Machine Learning** **Units: 0.0**

CIS 098	Database Programming with SQL	
MATH 003E	Linear Algebra	
CIS 008	Introduction to Parallel and Cloud Programming	
CS 060	Applications of Artificial Intelligence and Deep Learning	
CS 020	Python Application Programming	0.0

**Group F: Swift Software Development** **Units: 0.0**

CS 025	Swift Application Programming	
AND		

CS 026            Swift Data Structures and Algorithms

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AND

CS 027            Swift Universal Framework Applications

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AND

CS 247            Swift Multi-Platform Application Development

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**Total: 31.0-32.0**