The field of computer science leads to a variety of careers that all require core computer science skills. These skills include theory classes such as Computer Hardware, Data Structures, Databases, and Networks, as well as programming in different computer languages. Thereafter, within the field, areas of specialty lead into careers including software development, project management, system analysis, and maintenance among other areas. With the Internet being an integral part of everyday life, Web page authoring and Web application development have been other areas of high demand in the job market.

This major may also lead to many other careers. For additional possibilities, visit the Career Services Center on campus to utilize computerized career information systems and other valuable career resources.

ASSOCIATE IN ARTS DEGREE-60 UNITS

Students must complete major requirements in effect at the time enrollment begins or major requirements in effect at graduation as long as continuous enrollment is maintained. See SMC catalogue for definition of continuous enrollment.

PLEASE NOTE: Career Certificates may be expanded into Associate in Arts Degrees by completing a total of 60 units that include the general education requirements and recommended courses from the certificate areas. Additional GE requirements for AA degree can be found on a separate sheet found in the Transfer/Counseling Center or on HTTP://WWW.SMC.EDU/TRANSFER/ARTICULATION.

COMPUTER SCIENCE (34 major coursework units required)

Computer Science majors cover a broad spectrum of courses ranging from core computer science to a variety of branch fields of computer science. This certificate provides the student with the basic skills required of core computer science. Courses include programming in low-level and essential languages, Database Theory, Operating System Fundamentals, Computer Hardware and Data Structures. Students finishing this degree are well equipped to work in the field of computer science as well as transfer to a four-year degree program in this area.

Required core courses:

Each course must be completed with a grade of "C" or higher:

CS 3, 17, 40, 42, 50, 60; Math 7, 8

Required concentration courses: Select one of the following groups:

GROUP 1: CS 52 and CS 20A
GROUP 2: CS 55 and CS 20B

COMPUTER PROGRAMMING (27-29 major coursework units required)

A computer programmer is a professional who is skilled in writing medium to large-scale computer applications. This requires the knowledge and practice of a multitude of areas in Computer Science. This certificate focuses on learning and using advanced programming techniques to build software applications. In addition, it covers core computer science concepts such as Operating Systems and Database Theory.

Required core courses:

Each course must be completed with a grade of "C" or higher:

CS 3, CS 40 or 80; CS 50; CS 60; Math 20 (or higher level courses)

Required concentration courses: Select two of the following groups:

GROUP 1: CS 15 and CS 19
GROUP 2: CS 81 and (CS 82 or 83 or 84 or 85)
GROUP 3: CS 65 and CS 66
GROUP 4: CS 52 and (CS 51 or CS 20A)
GROUP 5: CS 55 and (CS 56 or CS 20B)

ADDITIONAL INFORMATION ON REVERSE. SUBJECT TO CHANGE WITHOUT NOTICE.

*www.assist.org
*Please access the above web-site for the most updated articulation information.
DATABASE APPLICATIONS DEVELOPER (33 major coursework units required)

A Database Applications Developer develops user-friendly interfaces to database applications. A database application is made of data, a database engine to store the data, and an interface to extract and display the data. The skills needed to build a database application range from database theory and design, using a database engine such as SQL server, or Oracle, to programming in ADO technologies to extract the data, as well as programming in Windows and Web applications on a client and server-side basis to present the data. In addition, with increasing concerns over security, a database developer must also be able to write secure code that runs with minimum risk of attacks.

Required courses:

Each course must be completed with a grade of "C" or higher:

- CS 3, Introduction to Computer Systems (3)
- CS 15, Visual Basic Programming (3)
- CS 19, Visual Basic Advanced Programming (3)
- CS 32, Database Programming in VB.NET (3)
- CS 37, WEB Programming in VB.NET (3)
- CS 60, Database Concepts and Applications (3)
- CS 61, Microsoft SQL Server Database (3)
- CS 65, Oracle Programming (3)
- CS 74A, Security in VB .NET Applications (3)

Select two of the following courses: (6 units)

- CS 66, Advanced Oracle (3)
- CS 68, Oracle Database Administrator (3)
- CS 84, Programming with XML (3)
- CS 85, PHP Programming (3)

WEB PROGRAMMER (30 major coursework units required)

A Web Programmer designs and develops applications and scripts for the World Wide Web (WWW). Web programmers need to be knowledgeable on a variety of Internet technologies (HTML, CSS, XML, JavaScript, Perl/CGI, Java, JSP, PHP, and the Microsoft .Net platform), networking, and database management. They are chiefly responsible for providing the programming which makes Web pages interactive or allows users to interact with back-end applications and databases. Web programmers are instrumental in making electronic commerce on the Internet possible.

Required courses:

Each course must be completed with a grade of "C" or higher:

- CS 3, Introduction to Computer Systems (3)
- CS 60, Database Concepts and Applications (3)
- CS 70, Networking Theory and Essentials (3)
- CS 80, Internet Programming (3)
- CS 81, JavaScript and Dynamic HTML (3)
- CS 84, Programming with XML (3)

Select one of the following two groups: (6 units)

- CS 15, Visual Basic Programming (3) and CS 19, Advanced Visual Basic Programming (3)
- CS 55, Java Programming (3) and CS 56, Advanced Java Programming (3)

Select one of the following courses: (3 units)

- CS 32, Database Programming in VB .NET (3) or CS 61, Microsoft SQL Server Database (3)
- CS 65, Oracle Programming (3)

Select one of the following courses: (3 units)

- CS 37, Web Programming in VB .NET (3) or CS 82, Server-Side Web Programming (3)
- CS 83, Server Side Java Web Programming (3) or CS 85, PHP Programming (3)
CAREER CERTIFICATES

PLEASE NOTE: Career Certificates may be expanded into Associate in Arts Degrees by completing a total of 60 units that include the general education requirements and recommended courses from the certificate areas.

COMPUTER SCIENCE (34 units required)

A Career Certificate is granted in Computer Science for Transfer upon completion of the 34 required units listed under Computer Science for Transfer AA. Each course must be completed with a grade of "C" or better.

COMPUTER PROGRAMMING (27-29 units required)

A Career Certificate is granted in Computer Programming upon completion of the 27-29 required units listed under the Computer Programming AA. Each course must be completed with a grade of "C" or better.

DATABASE APPLICATIONS DEVELOPER (33 units required)

A Career Certificate is granted in Database Applications Developer upon completion of the 33 required units listed under the Database Applications Developer AA. Each course must be completed with a grade of "C" or better.

WEB PROGRAMMER (30 units required)

A Career Certificate is granted in Web Programmer upon completion of the 30 required units listed under the Web Programmer AA. Each course must be completed with a grade of "C" or better.

*www.assist.org
*Please access the above web-site for the most updated articulation information.
CSIS DEPARTMENT CERTIFICATES OF COMPLETION

COMPUTER PROGRAMMING (12 units required)

This certificate provides the student with the basic skills needed to enter the world of programming. It covers a range of programming language courses that expose the student to the spectrum of different languages that are popular today.

Each course must be completed with a “C” or higher.

- CS 3, Introduction to computer applications (3)
- CS 15, Visual Basic (3)
- CS 17, Assembly Language Programming (3)
- CS 52, C++ Programming (3)

INFORMATION SYSTEMS MANAGEMENT (13 units required)

A certificate in IS Management aims to provide Computer Science students with the knowledge needed to develop Information Systems in a real-world setting. Students learn how to develop medium to large scale applications while applying the skills needed to plan and budget resources in development projects from conceptual design to deployment.

Each course must be completed with a “C” or higher.

- CS 9A/CIS 9A, Technology Project Management I (3)
- CS 9B/CIS 9B, Technology Project Management II (3)
- CS 15, Visual Basic Programming (3)
- CS 88A, Independent Study (1)

Select one of the following:

- CS 19, Advanced Visual Basic Programming (3)
- or
- CS 32, Database Programming in Visual Basic .NET (3)
- or
- CS 37, Web Programming in Visual Basic .NET (3)

NETWORKING (17 units required)

The IT world is integrated by networks. Success in IT disciplines like database, website, or ecommerce development demands a supporting grasp of the network environment. Major technologies are the networks themselves, their fit within the operating platforms they connect to, specific network applications, and measures to achieve networks security.

Network engineers and other qualified IT specialists must understand the various protocols, programs’ interfaces to them, how networks are presented and managed on Unix and Windows platforms, specific server programs and their clients, and what the inherent risks are.

Each course must be completed with a “C” or higher.

Required courses:

- CS 9A, Technology Project Management I (3)
- CS 41, Linux Network Administration (3)
- CS 43, Windows Network Administration (3)
- CS 70, Network Fundamentals & Architecture (3)
- CS 75, Network Protocols and Analysis (2)
- CS 78, Secure Server Installation & Administration (3)
A certificate in Robotics & Artificial Intelligence (AI) aims to provide Computer Science students with the knowledge and skills needed to work in the emergent AI career field, which includes robotics, knowledge engineering, and virtual human design. Students learn how to program embedded systems to operate mobile robotics that can interact with changing environments, how to create and maintain expert systems, and how to design and build virtual humans that converse much like people. All classes are very much “hands-on”.

Each course must be completed with a “C” or higher.

- CS 9A/CIS 9A, Technology Project Management I (3)
- CS 22, Introduction to Mobile Robots (3)
- CS 23, Expert Systems and Chatbots (3)
- CS 25, Embedded Systems (3)
- CS 42, Computer Architecture (3)
- CS 88A, Independent Study (1)