COMPUTER SCIENCE

SCHOOL OF MATHEMATICS, SCIENCE, AND ENGINEERING

DEAN: Michael Odu, Ph.D., Office 215A, 619-482-6344
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DEPARTMENT CHAIR: Peter Herrera, M.A.; Silvia Nadalet, M.A.

GENERAL DESCRIPTION

Computer science is the youngest of the sciences and focuses on the study of computer software, architecture, theory, and applications. This discipline explores computing theory and symbolic computation, the nature of computer architecture and operating systems, data communications, graphics, software engineering, mathematical applications, robotics, artificial intelligence, and system software.

There are many curriculum choices open to students interested in the science of computers. Students interested in the hardware aspect of computers should look at the vocational and transfer courses offered in engineering and electronics programs. Students interested in the operations aspect of computers should review the programs offered in computer information systems and computer literacy courses.

The Computer science program at SWC focuses on the programming or software aspect of computer science and offers three academic pathways from which to choose:

- Transfer preparation associate degree for students who plan to transfer and major in computer science
- Career/Technical associate degree for students seeking employment at the technician level in science or mathematics fields
- Career/Technical certificate

CAREER OPTIONS

Many career options are available for the computer science major, a few of these require an associate in arts degree, most require a bachelor's degree, and some require a graduate degree. Possible career options include: computer scientist, systems analyst, computer service coordinator, software engineer, computer graphic specialist, high school or college teacher, data base administrator, researcher, program analyst, teleprocessing coordinator, knowledge engineer, technical control specialist, systems manager, data processing application programmer, information specialist and positions available in allied professions of business, industry, and scientific technology.

DEGREE/CERTIFICATE OPTIONS — MAJOR CODE

Associate in Arts Degree: Transfer Preparation

Computer Science	01180
Computer Science (SB1440)	01185

Associate in Science Degree: Career/Technical

Computer Science	02190

Certificate of Achievement

Computer Science	02191

Consult with a counselor to develop a Student Education Plan (SEP), which lists the courses necessary to achieve your academic goal.

The program below is undergoing modification and the modification will be placed into an addendum upon Chancellor's Office approval - see your counselor for further information and visit the college website under http://www.swccd.edu/catalog link for the latest addenda updates.

ASSOCIATE IN ARTS DEGREE

COMPUTER SCIENCE ⚠

ASSOCIATE IN ARTS DEGREE
TRANSFER PREPARATION * (MAJOR CODE: 01180)

Most careers in computer science require a bachelor's degree, and some require a graduate-level degree. The coursework for this associate degree prepares students who plan to transfer and major in computer science with the lower-division computer programming and mathematics coursework required by most colleges and universities.

The program of study listed below is for students interested in the programming or software aspect of computer science. It is designed to provide a strong foundation in mathematics, programming methodology and skills, and computer organization.

Program Student Learning Outcome Statement

- Recognize and appropriately apply current and historical Software Engineering design patterns, algorithms, and data structures to produce efficient, well-engineered software products.

FIRST SEMESTER

MATH 130	Introduction to Computer Programming	4
MATH 250	Analytic Geometry and Calculus I	5

⚠⚠ *Some courses within this program may require additional coursework that must be completed prior to enrollment in these courses. Please consult the individual course listings for prerequisites and any other limitations on enrollment.*

SECOND SEMESTER

MATH 140	Data Structures and Algorithms	4
MATH 251	Analytic Geometry and Calculus II	4

THIRD SEMESTER

MATH 252	Analytic Geometry and Calculus III	4

FOURTH SEMESTER

MATH 254	Introduction to Linear Algebra	4
MATH 260	Discrete Mathematics	3
	Total units	**28**

Recommended Electives: MATH 253; PHYS 270, 272, and 274 or CHEM 200 and 210 or BIOL 210, 211 and 212.

To earn an associate degree, additional general education and graduation requirements must be completed. See page 64.

* Students planning to transfer to a four-year college or university should complete courses specific to the transfer institution of choice. University requirements vary from institution to institution and are subject to change. Therefore, it is important to verify transfer major preparation and general education requirements through consultation with a counselor in either the Counseling Center or Transfer Center. See catalog TRANSFER COURSES INFORMATION section on page 45 for further information.

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ASSOCIATE IN SCIENCE FOR TRANSFER

COMPUTER SCIENCE ⚠

STUDENT TRANSFER ACHIEVEMENT REFORM (STAR) ACT (SB1440)

Associate Degree for Transfer
A Degree with a Guarantee.™

ASSOCIATE IN SCIENCE DEGREE TRANSFER PREPARATION * (MAJOR CODE: 01185)

Most careers in computer science require a bachelor's degree, and some require a graduate-level degree. The coursework for this associate degree prepares students who plan to transfer and major in computer science with the lower-division computer programming and mathematics coursework required by most colleges and universities. The program of study listed below is for students interested in the programming or software aspect of computer science. It is designed to provide a strong foundation in mathematics, programming methodology and skills, and computer organization.

REQUIRED CORE:

MATH 130	Introduction to Computer Programming	4
MATH 140	Data Structures and Algorithms	4
MATH 230	Computer Organization and Architecture	4
MATH 250	Analytic Geometry and Calculus I	5
MATH 251	Analytic Geometry and Calculus II	4
MATH 260	Discrete Mathematics	3
PHYS 270	Principles of Physics I	3
PHYS 271	Principles of Physics Laboratory I	1
PHYS 272	Principles of Physics II	3
PHYS 273	Principles of Physics Laboratory II	1
	Total units	**32**

* Students planning to transfer to a four-year college or university should complete courses specific to the transfer institution of choice. University requirements vary from institution to institution and are subject to change. Therefore, it is important to verify transfer major preparation and general education requirements through consultation with a counselor in either the Counseling Center or Transfer Center. See catalog TRANSFER INFORMATION section on page 45 for further information.

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ASSOCIATE IN SCIENCE DEGREE

COMPUTER SCIENCE ⚠

ASSOCIATE IN SCIENCE DEGREE CAREER/TECHNICAL (MAJOR CODE: 02190)

The program of study listed below is designed for students who seek employment at the technician level in the science or mathematics fields. Completion of this program of study does not satisfy the lower-division requirements for transfer to colleges or universities. Students who plan to transfer should complete the courses listed under the Computer Science Associate in Arts degree program.

Program Student Learning Outcome Statement

- Recognize and appropriately apply current and historical Software Engineering design patterns, algorithms, and data structures to produce efficient, well-engineered software products.

FIRST SEMESTER

MATH 119	Elementary Statistics	4
MATH 130	Introduction to Computer Programming	4

SECOND SEMESTER

MATH 140	Data Structures and Algorithms	4
MATH 250	Analytic Geometry and Calculus I	5

THIRD SEMESTER

MATH 230	Computer Organization and Architecture	4
	Total units	**21**

Recommended Electives: MATH 251, 252, 253, 254, 260.

To earn an associate degree, additional general education and graduation requirements must be completed. See page 64.

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CERTIFICATE

COMPUTER SCIENCE ⚠

CERTIFICATE OF ACHIEVEMENT
CAREER/TECHNICAL (MAJOR CODE: 02191)

GAINFUL EMPLOYMENT:

The U.S. Department of Education requires colleges to disclose a variety of information for any financial aid eligible program that "prepares students for gainful employment in a recognized occupation."

Students who complete this program will have acquired the necessary analytical tools to successfully secure gainful employment in the field of study.

For more information regarding the data provided for this program and what it means to you as a student, please feel free to visit our SWC Gainful Employment website at: www.swccd.edu/gainfulemployment

Program Student Learning Outcome Statement

- Recognize and appropriately apply current and historical Software Engineering design patterns, algorithms, and data structures to produce efficient, well-engineered software products.

FIRST SEMESTER

MATH 119	Elementary Statistics	4
MATH 130	Introduction to Computer Programming	4

SECOND SEMESTER

MATH 140	Intermediate Computer Programming	3
MATH 250	Analytic Geometry and Calculus I	5

THIRD SEMESTER

MATH 230	Computer Organization and Architecture	4
	Total units	**20**

CONSTRUCTION INSPECTION

SCHOOL OF BUSINESS AND TECHNOLOGY

DEAN: Mink Stavenga, DBA, Office 470K, 619-482-6569
DEPARTMENT CHAIR: Marie Vicario-Fisher, M.S., M.P.H.

GENERAL DESCRIPTION

Construction Inspection is the study of the design, fabrication, codes, inspection processes, and licensure governing the construction of structures, both residential and commercial. This program explores blueprint reading, site plans, cost estimation, construction materials, soil engineering, mechanical construction, inspection procedure, building codes, quality control management, and license laws for contractors.

CAREER OPTIONS

Below is a sample of the options for construction inspection majors. Most require a certificate achievement or an associate in science degree, some require a bachelor's degree, and a few of these may require a graduate-level degree: construction inspector, estimator, apprentice as a carpenter, electrician, plumber, mason, cement finisher, roofer, painter, licensed contractor, soil engineer, architect, project engineer, quality control manager, vocational teacher, and positions available in all professions of manufacturing, retail and wholesale, business, industry, and the military or government.

⚠ ⚠ *Some courses within this program may require additional coursework that must be completed prior to enrollment in these courses. Please consult the individual course listings for prerequisites and any other limitations on enrollment.*