PROGRAMS

SCHOOL OF MATHEMATICS, SCIENCE, AND ENGINEERING

DEAN: Michael Odu, Ph.D., Office 215A, 619-482-6344


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.

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.

DEGREE/CERTIFICATE OPTIONS

<table>
<thead>
<tr>
<th>Program in Arts Degree: Transfer Preparation</th>
<th>MAJOR CODE</th>
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<tbody>
<tr>
<td>Computer Science</td>
<td>01180</td>
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<tr>
<td>Computer Science (SB1440)</td>
<td>01185</td>
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<tr>
<th>Program in Science Degree: Career/Technical</th>
<th>MAJOR CODE</th>
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<tbody>
<tr>
<td>Computer Science</td>
<td>02190</td>
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Certificate of Achievement

- Computer Science
  - Computer Science
    - MAJOR CODE: 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

<table>
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<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Units</th>
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<tbody>
<tr>
<td>MATH 130</td>
<td>Introduction to Computer Programming</td>
<td>4</td>
</tr>
<tr>
<td>MATH 250</td>
<td>Analytic Geometry and Calculus I</td>
<td>5</td>
</tr>
</tbody>
</table>
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.

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.

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.