

# COMPUTER SCIENCE

## Associate Degree

- Computer Science - Associate in Science for Transfer

### COMSC 020 Introduction to Programming Concepts and Methodologies 3 Units

This course is an introduction to basic computer programming concepts using both the procedural and an object-oriented paradigm. It is intended for non-computer science majors, and for students interested in COMSC 075 who would like a more gradual entry into computing fundamentals. Topics include hands-on practice with software engineering tools, simple programs, variables, control structures, functions, input/output, and introduction to abstraction. Specifications, adherence to style guidelines, and the importance of testing to ensure that programs are usable, robust, and modifiable, will be addressed throughout the course. (C-ID COMP 112)

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
 Recommended: Basic knowledge of computer usage and keyboarding skills  
 Advisory Level: Read: 3 Write: 3 Math: 2  
 Transfer Status: CSU/UC Degree Applicable: AA/AS  
 CSU GE: None IGETC: None District GE: None

### COMSC 072 Discrete Mathematics 4 Units

This course covers the mathematical concepts and techniques needed for students of mathematics and computer science. Topics include basic logic, predicates and quantifiers, proof techniques, sets and relations, induction and recursion, counting techniques and probability, and an introduction to graphs and trees.

Lecture Hours: 4 Lab Hours: None Repeatable: No Grading: L  
 Prerequisite: MATH 021 and MATH 022 or MATH 025; all with C or better  
 Advisory Level: Read: 3 Write: 3 Math: None  
 Transfer Status: CSU/UC Degree Applicable: AA/AS  
 CSU GE: B4 IGETC: 2A District GE: B4  
 Credit by Exam: Yes

### COMSC 075 Computer Science I: Introduction to Program Structures 3 Units

This course is an introduction to computer science using an object-oriented programming language. Students will write computer programs that include control structures, iteration, methods and argument passing, and classes. Problem solving, documentation, programming style, and program design and development are addressed throughout the course. (C-ID COMP 122)

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
 Prerequisite: MATH 021 and MATH 022, or MATH 025 all with C or better or placement by multiple measures  
 Recommended: COMSC 020  
 Advisory Level: Read: 3 Write: 3 Math: None  
 Transfer Status: CSU/UC Degree Applicable: AA/AS  
 CSU GE: None IGETC: None District GE: None

### COMSC 076 Computer Science II: Introduction to Data Structures 3 Units

This course covers data abstraction and structures as well as associated algorithms for linear lists, stacks, queues, trees, and other linked structures, arrays, strings, and hash tables. Software engineering techniques are applied to the design and development of large programming projects in an object-oriented environment. Searching and sorting algorithms are also covered. (C-ID COMP 132)

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
 Prerequisite: COMSC 075 with C or better  
 Advisory Level: Read: 3 Write: 3 Math: None  
 Transfer Status: CSU/UC Degree Applicable: AA/AS  
 CSU GE: None IGETC: None District GE: None

### COMSC 077 Introduction to Computer Systems 3 Units

This course covers the internal organization and operation of digital computers at the assembly language level. Topics include the mapping of high-level language constructs into sequences of machine-level instructions; assembly language and assemblers; linkers and loaders; internal data representations and manipulations; numerical computation; input/output (I/O) and interrupts; functions calls and argument passing; and the basic elements of computer logic design. (C-ID COMP 142)

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
 Prerequisite: COMSC 075 with C or better  
 Advisory Level: Read: 3 Write: 3 Math: None  
 Transfer Status: CSU/UC Degree Applicable: AA/AS  
 CSU GE: None IGETC: None District GE: None

### COMSC 078 Structure and Interpretation of Computer Programs 4 Units

This course covers the elements of the functional, object-oriented, and declarative programming paradigms. Topics include procedural abstraction; control abstraction using recursion, higher order functions, generators, and streams; data abstraction using interfaces, objects, classes, and generic operators; and language abstraction using interpreters and macros. Students will complete several significant programming projects using Python. The central idea in this course is the management of program complexity through abstraction.

Lecture Hours: 3 Lab Hours: 3 Repeatable: No Grading: L  
 Prerequisite: MATH 066 or MATH 071 with C or better  
 Corequisite: MATH 066 or MATH 071; Recommended: Programming experience equivalent to that gained from completing COMSC 020 or COMSC 075 or an Advanced Placement Computer Science Course A, with a score of 3 or higher is strongly recommended.  
 Advisory Level: Read: 3 Write: 3 Math: None  
 Transfer Status: CSU/UC Degree Applicable: AA/AS  
 CSU GE: None IGETC: None District GE: None

**COMSC 079C Programming in C 3 Units**

This course covers the C programming language for students who already know how to program. It includes computation, input and output, flow of control, functions, arrays, strings, pointers, linked structures, use of dynamic storage, and implementation of abstract data types. The course concludes with coverage of object-oriented programming in C++.

Lecture Hours: 2 Lab Hours: 3 Repeatable: No Grading: L  
Recommended: Programming skills and knowledge comparable to those obtained in the Python or Java programming languages.  
Advisory Level: Read: 3 Write: 3 Math: 4  
Transfer Status: CSU/UC Degree Applicable: AS  
CSU GE: None IGETC: None District GE: None

**COMSC 080 Discrete Structures 3 Units**

This course is an introduction to the discrete structures used in computer science with an emphasis on their applications. Topics include basic logic; predicates and quantifiers; proof techniques; sets, functions, and relations; induction and recursion; counting techniques and discrete probability; and graphs and trees. (C-ID COMP 152)

Lecture Hours: 3 Lab Hours: None Repeatable: No Grading: L  
Prerequisite: COMSC 075 with C or better  
Advisory Level: Read 4 Write: 4 Math: 5  
Transfer Status: CSU/UC Degree Applicable: AA/AS  
CSU GE: B4 IGETC: 2A District GE: B4

**COMSC 138 Work Experience 1-8 Units**

Occupational Work Experience is designed for students who work or volunteer in a field related to their career major. Students are required to provide evidence that they are enrolled in a career program (e.g., education plan or coursework in a career/occupational subject area). Students can earn one unit of credit for each 60 hours of unpaid volunteer time or 75 hours of paid work during the semester. Students can repeat Career/Occupational Work Experience, combined with General Work Experience, or alone, up to a maximum of 16 units. Internship/job placement is not guaranteed.

Lecture Hours: None Lab Hours: 2.07 Repeatable: Yes Grading: O  
Corequisite: Be employed or a volunteer at an approved work-site for the minimum number of hours per unit as stipulated for paid and unpaid status.  
Advisory Level: Read: 3 Write: 3 Math: None  
Transfer Status: CSU Degree Applicable: AA/AS  
CSU GE: None IGETC: None District GE: None