



### COMPUTER SOFTWARE DEVELOPMENT

The Computer Software Development major is for those students who wish to specialize in the development and performance of application software.

### CAREER OPPORTUNITIES

Software Development & Systems Administration are major employment fields for computer programmers and software developers. It is an excellent preparation for advancement in systems analysis, design, and management.

### UNITS REQUIRED FOR MAJOR: 45

### UNITS REQUIRED FOR CERTIFICATE(S): 20-40

### ASSOCIATE DEGREE REQUIREMENTS:

- English proficiency: ENGL 1A, ESL 26 or equivalent.
- Mathematics proficiency: MATH 103/105 or equivalent.

A minimum of 90 units required to include:

- All General Education requirements
- Core courses (25 Units)
- Elective courses (20 Units)
- Other graduation requirements as appropriate.

**NOTE:** All courses pertaining to the major must be taken for a letter grade. In addition, a GPA of 2.0 or higher is required in all Core and Support courses for the Degree or Certificates. 50% of the major units must be taken within Computers, Technology & Information Systems Division.

### CORE COURSES: 25 Units

CIS 15A Computer Science I: C++ (5 units)  
 CIS 15B Computer Science II: C++ (5 units)  
 CIS 15C Computer Science III: C++ (5 units)

or

CIS 27A Computer Science I: JAVA (5 units)  
 CIS 27B Computer Science II: JAVA (5 units)  
 CIS 27C Computer Science III: Data Structures & Algorithms  
 in JAVA (5 units)

and

CIS 52A Introduction to Data Management Systems (5 units)  
 CIS 78 Software Engineering (5 units)

### ELECTIVE COURSES: 20 Units

CIS 12A Fundamentals of Visual Basic.NET Programming (5 units)

MATH 22 Discrete Mathematics (5 units)  
 CIS 68A Introduction to Linux & UNIX (5 units)  
 CIS 68B Linux & UNIX Shell Programming (5 units)  
 CIS 27P JAVA for Programmers (5 units)  
 CIS 52B Oracle SQL (5 units)

### CERTIFICATE INFORMATION:

All certificates require:

- English proficiency: ENGL 1A, ESL 26 or equivalent.
- Mathematics proficiency: MATH 103/105 or equivalent.

### LINUX/UNIX System Operation & Administration

#### Certificate of Achievement (40 Units)

##### **Core Courses (30 Units):**

CIS 27A Computer Science I: JAVA (5 units)  
 or CIS 15A Computer Science I: C++ (5 units)  
 CIS 68A Introduction to Linux & UNIX (5 units)  
 CIS 68B Linux & UNIX Shell Programming (5 units)  
 CIS 68C1 Linux & UNIX System Administration (5 units)  
 CIS 68C2 Linux & UNIX Networking Administration (5 units)  
 CNET 54A Network Fundamentals the TCP/IP Protocol Suite (5 units)

##### **Electives (10 Units):**

CIS 27B Computer Science II: JAVA (5 units)  
 or CIS 15B Computer Science II: C++ (5 units)  
 CIS 68E Programming in PERL (5 units)  
 CIS 68K Introduction to Python Programming (5 units)

### Object-Oriented Software Using C++ Certificate of Achievement (40 Units)

##### **Core Courses (25 Units):**

CIS 15A Computer Science I: C++ (5 Units)  
 CIS 15B Computer Science II: C++ (5 Units)  
 CIS 15C Computer Science III: C++ (5 Units)  
 CIS 52A Introduction to Data Management Systems (5 Units)  
 CIS 78 Software Engineering (5 Units)

##### **Electives (15 Units):**

CIS 12A Fundamentals of Visual Basic.NET Programming (5 Units)  
 CIS 19A Introduction to Programming with C# (5 Units)  
 CIS 68A Introduction to Linux & UNIX (5 Units)  
 CIS 68B Linux & UNIX Shell Programming (5 Units)  
 CIS 68E Programming in PERL (5 Units)  
 CNET 54A Network Fundamentals & the TCP/IP Protocol Suite (CCNA 1) (5 Units)  
 CIS 27P JAVA for Programmers (5 Units)

### Object-Oriented Software Using JAVA Career Certificate (40 Units)

##### **Core Courses (25 Units):**

CIS 27A Computer Science I: JAVA (5 Units)  
 CIS 27B Computer Science II: JAVA (5 Units)  
 CIS 27C Computer Science III: Data Structures & Algorithms in JAVA (5 Units)  
 CIS 52A Introduction to Data Management Systems (5 Units)  
 CIS 78 Software Engineering (5 Units)

##### **Electives (15 Units):**

CIS 12A Fundamentals of Visual Basic.NET Programming (5 Units)  
 CIS 19A Introduction to Programming with C# (5 Units)  
 CIS 27D JAVA Advanced Features (5 Units)

CIS 68A Introduction to Linux & UNIX (5 Units)  
CIS 68B Linux & UNIX Shell Programming (5 Units)  
CIS 68E Programming in PERL (5 Units)  
CNET 54A Network fundamentals & the TCP/IP Protocol Suite  
(CCNA 1) (4 Units)

**Microsoft Certified Application Developer C# Skills  
Certificate (20 Units)**

Students will learn to use Microsoft.NET development tools to implement functional specifications, build, deploy, and maintain MS Windows and Web applications. Courses will prepare students for the Microsoft Certified Application Developer (MCAD) certification, which is a step toward earning the MCSD credential.

CIS 19A Introduction to Programming with C# (5 Units)  
CIS 19D Developing Windows-Based Applications with C#  
(5 Units)  
CIS 19W Developing Web Applications (5 Units)  
CIS 54C Microsoft SQL Server Database Design (5 Units)

**LINUX/UNIX Skills Certificate (20 Units)**

CIS 68A Introduction to Linux & UNIX (5 Units)  
CNET 54A Network Fundamentals & the TCP/IP Protocol Suite  
(CCNA 1) (5 Units)  
CIS 68C1 Linux & UNIX System Administration (5 Units)  
CIS 68C2 Linux & UNIX Networking Administration (5 Units)

**Academic Year 2008-2009**

**FOOTHILL COLLEGE  
GENERAL EDUCATION & GRADUATION REQUIREMENTS  
2008-2009**

The requirements for the Associate in Art or Associate in Science Degree include completion of (1) a minimum of 90 units in prescribed courses; (2) a minimum of 24 units taken at Foothill College; (3) a grade-point average of 2.0 or better in all college courses including Foothill courses; (4) a major of at least 27 units in a curriculum approved by the Foothill Curriculum Committee; and (5) the seven general education requirements listed below. Students planning to transfer to four-year colleges or universities should also check with a counselor for the specific requirements of those institutions.

Students must successfully complete a minimum of 30-35 units from the courses listed below with at least one course in Humanities, English, Natural Sciences (with lab), Social and Behavioral Sciences, Communication and Analytical Thinking, American Cultures and Communities, and two courses in Lifelong Understanding from two different academic departments. **Courses may only be used in one area.**

**I. Humanities**

**Arts:** ART 1, 2A, 2AH, 2B, 2BH, 2C, 2CH, 2D, 2E, 4A with 4AX, 5A with 5AX, 11, 14, 36, 45A with 45AX; F A 1; GID 1; MUS 1, 2A, 2B, 2C, 3A, 3B, 3C, 7, 7E, 7D, 8, 8H, 10, 64A, 64B, 85A, 85B; PHOT 1, 5, 8, 8H, 10, 11; THTR 1, 5, 5B, 20A, 20B, 20C, 20D, 24, 30; VART 2A, 2B, 2C, 36B; WMN 15.  
**Letters:** CHIN 1, 2, 3, 4, 5, 6, 13A, 13B, 14A, 14B, 25A, 25B; COMM 24; CRWR 6, 36B, 39A, 39B, 40, 41A, 41B, 60; ENGL 5, 8, 11, 12, 14, 17, 22, 23, 25, 25H, 26, 31, 32, 42A, 42B, 42C, 43, 45, 46A, 46B, 46C, 48A, 48B, 48C; FREN 1, 2, 3, 4, 5, 6, 13A, 13B, 14A, 14B, 25A, 25B, 39; GERM 1, 2, 3, 4, 5, 6, 13A, 13B, 14A, 14B, 25A, 25B, 39; HIST 4A, 4B, 4C, 4CH; HUMN 1A, 1B; JAPN 1, 2, 3, 4, 5, 6, 13A, 13B, 25A, 25B, 33; KORE 1, 2, 3, 4, 5, 6; LING 23, 25, 25H, 26; PHIL 2, 4, 8, 11, 20A, 22, 24, 25; SPAN 1, 2, 3, 4, 5, 6, 10A, 13A, 13B, 14A, 14B, 25A, 25; THTR 2A, 2B, 2C, 8.

**II. English**

ENGL 1A, 1AH or ESL 26.

**III. Natural Sciences (with laboratory)**

ASTR 10A with 10L, 10B with 10L, 10BH with 10L; BIOL 1A, 1B, 1C, 9 with 9L, 10, 13, 14, 15, 40A, 40B, 40C, 41; CHEM 1A, 10, 25, 30A; GEOG 1; GEOL 10, 11; HORT 10; MET 10 with 10L; PHYS 2A, 4A, 10.

**IV. Social & Behavioral Sciences**

ANTH 1, 2A, 2B, 3, 4, 5, 6, 8; BUSI 22, 53; CHLD 55; ECON 1A, 1B, 9, 12, 25; GEOG 1, 2, 5, 9, 10; GERM 8; HIST 4A, 4B, 4C, 4CH, 8, 9, 9H, 10, 15, 16, 16H, 17A, 17B, 17C, 18, 19, 20, 23A, 30; POLI 1, 2, 2H, 3, 3H, 5, 7, 8, 9, 15, 15H; PSYC 1, 4, 10, 14, 21, 22, 25, 30, 33, 40, 49, 55; SOC 1, 10, 11, 15, 19, 20, 21, 23, 30, 40; SOSC 20, WMN 5, 11, 21.

**V. Communication & Analytical Thinking**

CIS 12A, 15A, 18, 25A; COMM 1A, 1B, 2, 3, 4, 12, 24, 30, 46, 55; ENGL 1B, 1BH, 4; MATH 1A, 1B, 1C, 2A, 2B, 10, 11, 12, 22, 44, 46, 49, 51; PHIL 1, 7, 8, 50.

**VI. American Cultures and Communities**

ANTH 4; ART 2D; BIOL 14; CHLD 11; COMM 10, 12; ENGL 5, 8, 12, 31, 41, 48A, 48B, 48C; HIST 9, 9H, 10; MUS 8, 8H; PHIL 22; PHOT 8, 8H; POLI 7; PSYC 22; SOC 8, 23; SOSC 20; SPED 61; THTR 8; WMN 5, 11.

**VII. Lifelong Understanding**

Students must successfully complete a total of four units or more in Lifelong Understanding from two different academic departments. BIOL 8, 9, 45; BUSI 91L; CIS 2, 50A, 60; COIN 51; CNSL 1, 2, 72, 80, 90; COMM 2, 10, 12; CRLP 55, 70; DANC 1A, 1B, 2, 3A, 3B, 4, 5, 6, 7; HLTH 21; PHED 4; any physical activity course (PHED) or ALAP 60, 60X, 61, 61X, 62, 62X, 63, 63X, 64, 64X, 65, 65X, 66, 66X, 70, 70X, 71, 71X, 80, 80X; LIBR 1, 50, 71; SOC 19, 40; SOSC 20; SPED 52, 61, 72.

**Minimum proficiency: ENGL 1A or ESL 26 and MATH 103 or MATH 105\*, completed with a letter grade of "C" or better.**

\*Intermediate Algebra or equivalent means MATH 103 or 105, or mathematics placement test score indicating eligibility for a mathematics course beyond the level of MATH 105, or completion of a higher-level course with a grade of "C" or better, or completion of a bachelor degree or higher from an accredited U.S. college or university.