

COMPUTER SCIENCE & INFORMATION SYSTEMS

Degrees and Certificates Offered:

- ▶ Business Computer Applications: Associate in Science (A.S.), Certificate of Achievement
- ▶ Computer Networking: Associate in Science (A.S.), Certificate of Achievement, Certificate of Proficiency
- ▶ Computer Programming: Associate in Science (A.S.), Certificate of Achievement
- ▶ Programming for the Internet: Associate in Science (A.S.), Certificate of Achievement
- ▶ Scientific Programming: Associate in Science (A.S.), Certificate of Achievement
- ▶ UNIX Operating System: Associate in Science (A.S.), Certificate of Achievement
- ▶ Computer Hardware: Certificate of Proficiency

Also see: Liberal Arts: Computer Science and Information Systems Emphasis: A.A. Degree

Business Computer Applications

A.S. Degree or Certificate of Achievement

The Computer Applications Option prepares students for positions utilizing a wide variety of popular operating systems and business application software. The computer applications taught are used in most business environments including word processing, spreadsheets, databases, graphics, and desktop publishing. This degree is also appropriate for retraining and for improving promotional opportunities.

Career opportunities include general office work, document preparation, technical support, help desk training and support, word processing, administrative secretary and administrative services.

Transfer Students: Four-year colleges may differ in their major preparation requirements for transfer. Consult with a counselor regarding transfer requirements.

Program Learning Outcome: After completing this degree or certificate you will be able to use a variety of business software, including word processors and spreadsheets to create business letters, reports and other business documents.

To receive an Associate DEGREE complete:

- **REQUIRED COURSES** listed below.
- **GENERAL EDUCATION REQUIREMENTS,**

To receive a CERTIFICATE OF ACHIEVEMENT complete the:

- **REQUIRED COURSES** listed below.

REQUIREMENTS: Choose 21 units from the following list

Choose only one of the following two courses:

CSIS 1	Computer Literacy - MS Office (2 units)
CSIS 2	Computers in Business (4 units)

CSIS/DM/LIB 6	Web Page Authoring I (2 units)
CSIS 8	Introduction to the Internet (1 unit)
CSIS 10	Introduction to Programming using BASIC (2 units)
CSIS/DM 72	Desktop Publishing - QuarkXPress (3 units)
CSIS/DM 73	Desktop Publishing - Adobe InDesign (3 units)
CSIS/DM 75	PhotoShop I - Adobe PhotoShop (3 units)
ACCT/CSIS 121	Spreadsheet - MS Excel (1-2 units)
CSIS 124	Windows Fundamentals (1 unit)
CSIS 126	Word Processing - MS Word (2 units)
CSIS 128	Database - MS Access (2 units)
CMUN/CSIS 129	Presentation Graphics - MS PowerPoint (1 unit)
CSIS 132	Intermediate Word Processing - MS Word (2 units)
CSIS 134	Intermediate Excel (2 units)
CSIS 181	PC Hardware (4 units)
CSIS 182	Operating Systems (4 units)

Total units required: 21 units

Recommended electives: CSIS 7, 72, 73; DM 7, 72, 73

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Computer Networking

A.S. Degree or Certificate of Achievement

Computer Networking is designed to provide entry-level skills and knowledge for students to enter the networking profession. Students will be eligible to take the industry A+ hardware exam. The program also provides a solid foundation in network technology for students who plan to pursue further education in the networking field at a four year college.

Career Opportunities: network technician, network maintenance, network help desk, assistant network administrator, PC/network installation.

Program Learning Outcomes:

After completing this degree or certificate you will be able to:

- ▶ work individually and in teams.
- ▶ install and test hardware and software necessary for network connectivity.
- ▶ set up a connection with a remote host, employing appropriate commands.

To receive an ASSOCIATE DEGREE complete:

- **REQUIRED COURSES** listed below.
- **GENERAL EDUCATION REQUIREMENTS**

To receive a CERTIFICATE OF ACHIEVEMENT complete the:

- **REQUIRED COURSES** listed below.

REQUIREMENTS:

CSIS 48 UNIX/Linux Operating System (4 units)
 CSIS 178 Applied Networking (4 units)
 CSIS 179 Introduction to Information Security (4 units)
 CSIS 181 PC Hardware (4 units)
 CSIS 182 Operating Systems (4 units)
 CSIS 183 Introduction to Microsoft Servers (4 units)

Total units Required: 24 units

Computer Programming

A.S. Degree or Certificate of Achievement

Computer Programming prepares students for entry-level programming in a wide variety of occupations. Many of the courses will be needed for students transferring to a university to study Computer Science. Students planning to transfer need to research lower division major requirements at the transfer destination of their choice.

Career Opportunities: computer programming, application programming, help desk technical support, database specialist and web programmer.

Program Learning Outcomes:

After completing this degree or certificate, you will be able to:

- ▶ create programs in three different languages that use control flow statements such as if and switch statements.
- ▶ create programs in three different languages that use loop statements such as for and while statements.

To receive an ASSOCIATE DEGREE complete:

- **REQUIRED COURSES** listed below.
- **GENERAL EDUCATION REQUIREMENTS**

To receive a CERTIFICATE OF ACHIEVEMENT complete the:

- **REQUIRED COURSES** listed below.

REQUIREMENTS:

CSIS 46 C++ Programming II (4 units)
 CSIS 48 UNIX/Linux Operating System (4 units)

Choose one:

CSIS 45 C++ Programming I (4 units)
 CSIS 5 C++ Scientific Programming (3 units)

Choose 10 units:

CSIS/DM/LIB 6 Web Page Authoring I (2 units)
 CSIS 12/12L Assembly Language Programming (4 units)
 CSIS 24 Java Programming I (4 units)
 CSIS 44 C#.NET Programming (4 units)
 CSIS 51 Visual Basic .NET Programming (4 units)
 CSIS 54/54L Perl Programming/Perl Programming Lab (1-3 units)
 CSIS 78 Web Sites with SQL and PHP (4 units)

Total units required: 21-22 units

Recommended electives:

For transfer majors: MATH 1A and MATH 1B
 For non-transfer majors: MATH 233

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Programming for the Internet

A.S. Degree or Certificate of Achievement

Programming for the Internet prepares students for entry-level positions developing and maintaining Internet and Intranet web pages. The courses prepare students to create, modify, and program web pages, such as those used in electronic commerce. Students will gain knowledge in both technical and artistic sides of this profession.

Career Opportunities: web page developer, web programmer, technical support, webmaster

Program Learning Outcomes: After completing this degree or certificate, you will be able to:

- ▶ create, modify, and program web pages with images and forms.
- ▶ create programs in three different languages that use loop statements such as for and while statements.

To receive an ASSOCIATE DEGREE complete:

- **REQUIRED COURSES** listed below.
- **GENERAL EDUCATION REQUIREMENTS**

To receive a CERTIFICATE OF ACHIEVEMENT complete the:

- **REQUIRED COURSES** listed below.

REQUIREMENTS:

CSIS/DM/LIB 6 Web Page Authoring I (2 units)
 CSIS 51 Visual Basic .NET Programming (4 units)
 CSIS 54/54L Perl Programming/Perl Programming Lab (3-4 units)
 CSIS 84 JavaScript Programming (2 units)

Choose one:

CSIS 5 C++ Scientific Programming (3 units)
 CSIS 45 C++ Programming I (4 units)

Choose courses for at least 4 units:

CSIS/DM 7 Web Page Authoring II (2 units)
 CSIS/DM 75 PhotoShop I - Adobe PhotoShop (3 units)
 CSIS 78 Web Sites with SQL and PHP (4 units)
 CSIS/DM 85 Web Design I: Dreamweaver (2 units)
 CSIS/DM 110 Interactive Animation: Flash (3 units)

Total units required: 19-20 units

Recommended elective: MATH 233

Scientific Programming

A.S. Degree or Certificate of Achievement

Scientific Programming prepares students for entry-level scientific programming in a wide variety of occupations. Many of the courses will be needed for students transferring to a university to study Computer Science. Students planning to transfer need to research lower division major requirements at the transfer destination of their choice.

Career Opportunities: scientific programming, computer programming, statistical programming, research.

Program Learning Outcomes: After completing this degree, you will be able to:

- ▶ create programs in three different languages that use control flow statements such as if and switch statements.
- ▶ create scientific programs in three different languages that use loop statements such as for and while statements.

To receive an ASSOCIATE DEGREE complete:

- **REQUIRED COURSES** listed below.
- **GENERAL EDUCATION REQUIREMENTS**

To receive a CERTIFICATE OF ACHIEVEMENT complete the:

- **REQUIRED COURSES** listed below.

REQUIREMENTS:

CSIS 46 C++ Programming II (4 units)
 MATH 1A Single-Variable Calculus and Analytic Geometry (4 units)

Choose one:

CSIS 5 C++ Scientific Programming (3 units)
 CSIS 45 C++ Programming I (4 units)

Choose two:

CSIS 24 Java Programming I (4 units)
 CSIS 47 Visual C++ Programming (4 units)
 CSIS 51 Visual Basic .NET Programming (4 units)
 CSIS 54/54L Perl Programming/Perl Programming Lab (3-1 units)

Choose two:

MATH 1B Single-Variable Calculus and Analytic Geometry (4 units)
 MATH 5 Introduction to Statistics (3 units)
 MATH 7 Finite Mathematics (3 units)
 CSIS 26 Discrete Structures (4 units)

Total units required: 25-28 units

General Education requirements: A student may complete the Gavilan College A.A./A.S. general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 49-57 or see a counselor for details.

NOTE: A course may be used to satisfy both general education and major courses. See "Double Counting Rule" on page 47.

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UNIX Operating System

A.S. Degree or Certificate of Achievement

If you are using the web, you are using UNIX, since most large web servers are UNIX systems. The UNIX Operating System Option prepares students for entry-level positions working with UNIX/Linux operating systems. Many of the courses will be needed for students transferring to a 4-year college to study computer science. Students planning to transfer should research lower division major requirements at the transfer destination of their choice.

Career Opportunities: UNIX/Linux system administration, webmaster, C/C++ programming

Program Learning Outcomes: After completing this degree, you will be able to:

- ▶ use UNIX editors to create and modify files.
- ▶ modify, move, and rename files and directories. They will be able to use UNIX email and FTP commands.

To receive an ASSOCIATE DEGREE complete:

- **REQUIRED COURSES** listed below.
- **GENERAL EDUCATION REQUIREMENTS**

To receive a CERTIFICATE OF ACHIEVEMENT complete the:

- **REQUIRED COURSES** listed below.

REQUIREMENTS:

CSIS 48 UNIX/Linux Operating System (4 units)
CSIS 49 UNIX/Linux Shell Programming (4 units)

Choose one:

CSIS 18/18L UNIX/C++ Programming and
UNIX/C++ Programming Lab (3-1 units)
CSIS 45 C++ Programming I (4 units)
CSIS 5 C++ Scientific Programming (3 units)

Choose two:

CSIS 24 Java Programming I (4 units)
CSIS 46 C++ Programming II (4 units)
CSIS 54/54L Perl Programming/Perl Programming Lab (3-1 units)

Total units Required: 23-24 units

Computer Hardware

Certificate of Proficiency

Students receiving this certificate will have job entry skills in computer hardware repair. Students will be eligible to take the industry A+ hardware exam for certification.

REQUIREMENTS:

CSIS 181 PC Hardware (4 units)
CSIS 182 Operating Systems (4 units)

Total units required for Certificate of Proficiency: 8 units

Recommended electives: CSIS 122, CSIS 2 or 2L

Introduction to Computer Networking

Certificate of Proficiency

CSIS 178 Applied Networking (4 units)
CSIS 179 Introduction to Information Security (4 units)
CSIS 183 Introduction to Microsoft Servers (4 units)

Total units required for Certificate of Proficiency: 12 units

Recommended courses to be taken before starting (or concurrent with) the Networking sequence: CSIS 2L, 48, 181; MATH 205

General Education requirements: A student may complete the Gavilan College A.A./A.S. general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 49-57 or see a counselor for details.

NOTE: A course may be used to satisfy both general education and major courses. See "Double Counting Rule" on page 47.