

# COMPUTER SCIENCE & INFORMATION SYSTEMS

## **A.S. Degrees and Certificates of Achievement**

- Business Computer Applications
- Computer Networking
- Computer Programming
- Programming for the Internet
- Scientific Programming
- UNIX Operating System

## **Certificates of Proficiency**

- Computer Hardware
- Introduction to Computer Networking

## **ROP Certificates** *see page 223*

- Operating Systems
- PC Hardware



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Contact:  
(408) 848-4719  
cte@gavilan.edu

# Business Computer Applications *A.S. Degree or Certificate of Achievement*

To receive an ASSOCIATE’S DEGREE complete:

- ▶ **REQUIRED COURSES** listed below.
- ▶ **GENERAL EDUCATION REQUIREMENTS**, (Gavilan, IGETC or CSU pattern), plus sufficient electives to meet a 60 unit total. See pages 48-56.

To receive a CERTIFICATE OF ACHIEVEMENT complete the:

- ▶ **REQUIRED COURSES** listed below.

**REQUIREMENTS** Choose 21 units from the following list of courses:

Choose only one of the following two courses:

- CSIS 1 Computer Literacy - MS Office (2 units)
- CSIS 2 Computers in Business - MS Office (4 units)
- CSIS/DM/LIB 6 Web Page Authoring I (2 units)
- CSIS 8 Introduction to the Internet (1 unit)
- CSIS 10 BASIC Programming (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

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 a student will be able to use a variety of business software, including word processors and spreadsheets to create business letters, reports and other business documents.

Gainful Employment Statistics for Certificate		
Name of Program: (if different than the CIP program description)	CA in CSIS-Bus Comp Appl	
Program Length: (in years)	1.00	
# of units/credits required for program:	21	
Total Tuition and Required Fees for the entire program completed in normal time:	CA Resident	Nonresident
	\$ 798	\$ 4,578
Total estimated costs for books and supplies for the entire program:	\$ 1,620	
Total room and board charges for living on campus:	College does not offer on-campus living.	
For more information visit the Gavilan College Gainful Employment website at <a href="http://www.gavilan.edu/gainful_employment">http://www.gavilan.edu/gainful_employment</a> . Fees based on fall 2011 per-unit rates.		

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 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 46.

# Computer Hardware *Certificate of Proficiency*

**REQUIREMENTS:**

- CSIS 181 PC Hardware.....4 units
- CSIS 182 Operating Systems .....4 units
- Total Units Required for Certificate of Proficiency: 8 UNITS

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.

**Recommended Electives:** CSIS 122, CSIS 2 or 2L

## Computer Networking *A.S. Degree or Certificate of Achievement*

To receive an **ASSOCIATE'S DEGREE** complete:

- ▶ **REQUIRED COURSES** listed below.
- ▶ **GENERAL EDUCATION REQUIREMENTS**, (Gavilan, IGETC or CSU pattern), plus sufficient electives to meet a 60 unit total. See pages 48-56.

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

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 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 46.

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.

### Gainful Employment Statistics for Certificate

Name of Program: (if different than the CIP program description)	CA in CSIS-Computer Networking	
Program Length: (in years)	1.00	
# of units/credits required for program:	24	
Total Tuition and Required Fees for the entire program completed in normal time:	CA Resident	Nonresident
	\$ 906	\$ 5,226
Total estimated costs for books and supplies for the entire program:	\$ 1,620	
Total room and board charges for living on campus:	College does not offer on-campus living.	
For more information visit the Gavilan College Gainful Employment website at <a href="http://www.gavilan.edu/gainful_employment">http://www.gavilan.edu/gainful_employment</a> . Fees based on fall 2011 per-unit rates.		

**Program Learning Outcomes:** After completing this degree or certificate of achievement a student 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.

## 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

# Computer Programming *A.S. Degree or Certificate of Achievement*

To receive an ASSOCIATE'S DEGREE complete:

- ▶ **REQUIRED COURSES** listed below.
- ▶ **GENERAL EDUCATION REQUIREMENTS**, (Gavilan, IGETC or CSU pattern), plus sufficient electives to meet a 60 unit total. See pages 48-56.

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)	3-4 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 (3-1 units)	
CSIS 78	Web Sites with SQL and PHP (4 units)	10 units

Total Units Required: 21-22 UNITS

**Recommended Electives:**

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

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, data base specialist and Web programmer.

**Program Learning Outcomes:** After completing this degree, a student 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.

Gainful Employment Statistics for Certificate		
Name of Program: (if different than the CIP program description)	CA in CSIS-Comp Programming	
Program Length: (in years)	1.00	
# of units/credits required for program:	21-22	
Total Tuition and Required Fees for the entire program completed in normal time:	CA Resident	Nonresident
	\$ 798 - \$ 834	\$ 4,578 - \$ 4,794
Total estimated costs for books and supplies for the entire program:	\$ 1,620.00	
Total room and board charges for living on campus:	College does not offer on-campus living.	
For more information visit the Gavilan College Gainful Employment website at <a href="http://www.gavilan.edu/gainful_employment">http://www.gavilan.edu/gainful_employment</a> . Fees based on fall 2011 per-unit rates.		

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 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 46.

Visit the Gavilan College website to view the current Catalog [www.gavilan.edu/catalog](http://www.gavilan.edu/catalog)

# Programming for the Internet *A.S. Degree or Certificate of Achievement*

To receive an **ASSOCIATE'S DEGREE** complete:

- ▶ **REQUIRED COURSES** listed below.
- ▶ **GENERAL EDUCATION REQUIREMENTS**, (Gavilan, IGETC or CSU pattern), plus sufficient electives to meet a 60 unit total. See pages 48-56.

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 (3-1 units)	.4	units
CSIS 84	JavaScript Programming	.2	units

Choose one:

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

Choose courses for at least 4 units:

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

Total Units Required: 19-20 UNITS

**Recommended Elective:** MATH 233

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 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 46.

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, a student 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.

## Gainful Employment Statistics for Certificate

Name of Program: (if different than the CIP program description)	CA in CSIS-Prog for Internet	
Program Length: (in years)	1.00	
# of units/credits required for program:	19-20	
Total Tuition and Required Fees for the entire program completed in normal time:	CA Resident \$ 726 - \$ 762	Nonresident \$ 4,146 - \$ 4,362
Total estimated costs for books and supplies for the entire program:	\$ 1,620	
Total room and board charges for living on campus:	College does not offer on-campus living.	
For more information visit the Gavilan College Gainful Employment website at <a href="http://www.gavilan.edu/gainful_employment">http://www.gavilan.edu/gainful_employment</a> . Fees based on fall 2011 per-unit rates.		

# Scientific Programming *A.S. Degree or Certificate of Achievement*

**To receive an ASSOCIATE'S DEGREE** complete:

- ▶ **REQUIRED COURSES** listed below.
- ▶ **GENERAL EDUCATION REQUIREMENTS**, (Gavilan, IGETC or CSU pattern), plus sufficient electives to meet a 60 unit total. See pages 48-56.

**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)  
 ..... 3-4 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)  
 ..... 8 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 Math (4 units)  
 ..... 6-8 units

Total Units Required: 25-28 UNIT!

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, a student 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.

Gainful Employment Statistics for Certificate		
Name of Program: (if different than the CIP program description)	CA in CSIS-Scientific Program	
Program Length: (in years)	1.00	
# of units/credits required for program:	25-28	
Total Tuition and Required Fees for the entire program completed in normal time:	CA Resident	Nonresident
	\$ 942 - \$ 1,050	\$ 5,442 - \$ 6,090
Total estimated costs for books and supplies for the entire program:	\$ 1,620	
Total room and board charges for living on campus:	College does not offer on-campus living.	
For more information visit the Gavilan College Gainful Employment website at <a href="http://www.gavilan.edu/gainful_employment">http://www.gavilan.edu/gainful_employment</a> . Fees based on fall 2011 per-unit rates.		

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 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 46.



# UNIX Operating System

***A.S. Degree or Certificate of Achievement***



To receive an **ASSOCIATE'S DEGREE** complete:

- ▶ **REQUIRED COURSES** listed below.
- ▶ **GENERAL EDUCATION REQUIREMENTS**, (Gavilan, IGETC or CSU pattern), plus sufficient electives to meet a 60 unit total. See pages 48-56.

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
CSIS 52	Linux/UNIX System Administration	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)	3-4 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)	
CSIS 175A	Networking Essentials (4 units)	8 units

Total Units Required: 23-24 UNITS

**General Education Requirements:** A student may complete the Gavilan College AA/AS general education, the CSU-GE Breadth or the IGETC pattern, plus sufficient electives to meet a 60 unit total. See pages 48-56 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 46.

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 need to 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, a student 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.

## Gainful Employment Statistics for Certificate

Name of Program: (if different than the CIP program description)	CA in CSIS-UNIX	
Program Length: (in years)	1.00	
# of units/credits required for program:	23-24	
Total Tuition and Required Fees for the entire program completed in normal time:	CA Resident	Nonresident
	\$ 870 - \$ 906	\$ 5,010 - \$ 5,226
Total estimated costs for books and supplies for the entire program:	\$ 1,620	
Total room and board charges for living on campus:	College does not offer on-campus living.	
For more information visit the Gavilan College Gainful Employment website at <a href="http://www.gavilan.edu/gainful_employment">http://www.gavilan.edu/gainful_employment</a> . Fees based on fall 2011 per-unit rates.		