Computer Science
A.S.-T DEGREE: 60 units

Associate Degree for Transfer℠

DESCRIPTION

The Associate in Science in Computer Science for Transfer Degree (AS-T in Computer Science) has been established to assist students in seamlessly transferring from Gavilan College to a California State University (CSU),with the objective of pursuing a baccalaureate degree in computer science. The Associate in Science in Computer Science for Transfer Degree therefore necessarily requires the completion of a general education sequence of courses, as well as specific preparation for upper-division computer science coursework.

PROGRAM LEARNING OUTCOMES

Upon completion of the Associate in Science in Computer Science for Transfer Degree, students will be prepared for more advanced upper-division coursework in computer science, and will be able to:

- Code, debug, document, test, and run programs.
- Write programs in at least three different programming languages,and compare and contrast the philosophies and comparative advantages of each of these languages.
- Demonstrate professional conduct by meeting project deadlines, and participating in self managed teams.
- Create algorithms to solve programming problems, and implement those algorithms.

PROGRAM REQUIREMENTS: (28 UNITS)

REQUIRED CORE:

CSIS5 or	C++ Scientific Programming	3
CSIS45 or	C++ Programming I	3
CSIS24	Java Programming I	3
CSIS46 or	C++ Programming II	3
CSIS27	J ava Programming II	3
CSIS28	Computer Architecture and Organization	3
CSIS26	Discrete Structures	3
MATH1A	Single-Variable Calculus and Analytic Geometry	4
MATH1B	Single-Variable Calculus and Analytic Geometry	4
PHYS4A	Physics for Scientists and Engineers - Mechanics	4
PHYS4B	Physics for Scientists and Engineers - Electricity and Magnetism	4

ASSOCIATE DEGREE FOR TRANSFER REQUIREMENTS:

- Completion of 60 semester units that are eligible for transfer to the California State University, including both of the following:
1. The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education-Breadth Requirements.
2. A minimum of 18 semester units in a major or area of emphasis, as determined by the community college district.
- Obtainment of a minimum grade point average of 2.0.

Title 5 section 55063(a) also require that students must earn a "C" or better in all courses required for the major or area of emphasis, or a "P" if the course was taken on a 'pass-no-pass' basis.

TOTAL UNITS FOR THE MAJOR: 28

DOUBLE COUNTED UNITS: CSU 7; IGETC: 7

GENERAL EDUCATION REQUIREMENTS: CSU: 39; IGETC: 37

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 a counselor for details.

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

ELECTIVES AS NEEDED TO GET TO 60 UNITS:CSU:0; IGETC:2
TOTAL UNITS FOR THE DEGREE: 60

Computer Science & Information Systems Emphasis
A.A. DEGREE: 60 units

DESCRIPTION

Students will have the opportunity to explore several areas of computer science, including programming, web page design, system administration and desktop publishing.

PROGRAM LEARNING OUTCOMES

Students will develop an appreciation of both the technical and artistic sides of the profession. Students will be able to communicate ideas in a team environment.

REQUIREMENTS: (18 UNITS)

Choose any combination of courses for a minimum of 18 units:

COMPUTER SCIENCE & INFORMATION SYSTEMS:

CD12	Computer Education for Teachers	3
CSIS5	C++ Scientific Programming	3

CSIS6 or	Webpage Authoring	3
DM6	Webpage Authoring	3
CSIS7 or	Webpage Authoring II	2
DM7	Webpage Authoring II	2
CSIS8	Introduction to the Internet	1
CSIS9	Computer Education for Teachers	3
CSIS10	Introduction to Programming using BASIC.	3
CSIS12	Assembly Language Programming	3
CSIS12L	Assembly Language Programming Lab.	1
CSIS18	UNIX / C++ Programming	3
CSIS18L	UNIX / C++ Programming Lab	1
CSIS24	Java Programming I	3
CSIS26	Discrete Structures	3
CSIS43	C Programming	4
CSIS44	C#.NET Programming.	4
CSIS45	C++ Programming I	3
CSIS46	C++ Programming II.	3
CSIS47	Visual C++ Programming	3
CSIS49	UNIX / Linux Shell Programming	4
CSIS51	Visual Basic Programming	4
CSIS54	Perl Programming.	3
CSIS54L	Perl Programming Lab	1
CSIS84	Java Script Programming	2

DIGITAL MEDIA:

CSIS73 or	Desktop Publishing - Adobe InDesign	3
DM73	Desktop Publishing - Adobe InDesign	3
CSIS75 or	Photoshop I - Adobe Photoshop	3
DM75	Photoshop I - Adobe PhotoShop	3
DM74 or Advanced PhotoShop.		3
CSIS74	Advanced PhotoShop.	3
DM76 or	Digital Illustration	3
CSIS76	Digital Illustration	3
DM77 or	Introduction to Digital Media and its Tools	3
CSIS77	Introduction to Digital Media and its Tools	3
DM80 or	Digital Photography	3
CSIS80	Digital Photography	3
DM85 or	Web Development and Design	3
CSIS85	Web Development and Design	3
DM113	Introduction to Digital Video	3
DM114	Digital Media Production	2

GENERAL EDUCATION REQUIREMENTS: (35-39)

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 a counselor for details.

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

AREA OF EMPHASIS TOTAL: 18

Computer Programming
A.S. DEGREE: 60 units
CERTIFICATE OF ACHIEVEMENT: 21- 22 units

DESCRIPTION

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

Upon successful completion of this program, students 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.

REQUIREMENTS:

CSIS46	C++ Programming II.	3
CSIS48	UNIX/Linux Operating System	4

CHOOSE ONE:

CSIS45	C++ Programming I	3
CSIS5	C++ Scientific Programming	3

CHOOSE 10 UNITS FROM LIST BELOW:

CSIS6 or	Webpage Authoring	3
DM6	Webpage Authoring	3
CSIS12	Assembly Language Programming	3
CSIS12L	Assembly Language Programming Lab.	1
CSIS24	Java Programming I	3
CSIS44	C# .NET Programming	4
CSIS51	Visual Basic Programming	4
CSIS54	Perl Programming.	3
CSIS54L	Perl Programming Lab	1
CSIS78	Web Sites with SQL and PHP	4

RECOMMENDED ELECTIVES:

FOR TRANSFER MAJORS:

MATH1A	Single-Variable Calculus and Analytic Geometry	4
MATH1B	Single-Variable Calculus and Analytic Geometry	4

FOR NON-TRANSFER MAJORS:

MATH233	Intermediate Algebra	5

**FOR ASSOCIATE DEGREE, COMPLETE
GENERAL EDUCATION REQUIREMENTS (35-39)**

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 a counselor for details.

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

Computer Hardware
CERTIFICATE OF PROFICIENCY: 8 units

DESCRIPTION
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 (8 UNITS)
CSIS181   PC Hardware 4
CSIS182   Operating Systems 4

RECOMMENDED ELECTIVES:
CSIS2L or   Computers in Business Lab 1
CSIS2   Computers in Business. 4
CSIS122   Computer Keyboarding 0.5-2

Computer Networking
A.S. DEGREE: minimum of 60 units
CERTIFICATE OF ACHIEVEMENT: 24 units

DESCRIPTION
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
Upon successful completion of this program, students 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.

REQUIREMENTS: (24 UNITS)
CSIS48   UNIX/Linux Operating System 4
CSIS178   Applied Networking 4
CSIS179   Introduction to Information Security 4
CSIS181   PC Hardware 4
CSIS182   Operating Systems 4
CSIS183   Introduction to Microsoft Servers 4

**FOR ASSOCIATE DEGREE, COMPLETE
GENERAL EDUCATION REQUIREMENTS (35-39 UNITS)**

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 a counselor for details.

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

Computerized Accounting
CERTIFICATE OF PROFICIENCY: 17 units

DESCRIPTION

Students receiving the certificate will have entry-level computerized bookkeeping skills for a modern office.

REQUIREMENTS: (17 UNITS)
ACCT121 or   Spreadsheet - MS Excel 1-2
CSIS121   Spreadsheet - MS Excel 1-2
CSIS2L   Computers in Business Lab 1
ACCT20   Financial Accounting 4
ACCT21   Managerial Accounting 4
CSIS120 or   Computerized Accounting - QuickBooks 3
ACCT120   Computerized Accounting - QuickBooks 3

CHOOSE ONE:
ACCT103 or   General Office Accounting. 3
ACCT105 or   Payroll Accounting 3
ACCT111   Introduction to Income Tax . . . .

Programming for the Internet
A.S. DEGREE: 60 units
CERTIFICATE OF ACHIEVEMENT: 19-20 units

DESCRIPTION

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

Upon successful completion of this program, students 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.

REQUIREMENTS: (19 - 20 UNITS)
CSIS6 or	Webpage Authoring	3
DM6	Webpage Authoring	3
CSIS51	Visual Basic Programming	4
CSIS54	Perl Programming	3
CSIS54L	Perl Programming Lab	1
CSIS84	JavaScript Programming	2

CHOOSE ONE: (3 UNITS)
CSIS5	C++ Scientific Programming	3
CSIS45	C++ Programming I	3

CHOOSE COURSES FOR AT LEAST 4 UNITS:
CSIS7 or	Web Page Authoring II	2
DM7	Web Page Authoring II	2
CSIS75 or	Photoshop I - Adobe Photoshop	3
DM75	Photoshop I - Adobe PhotoShop	3
DM85 or	Web Development and Design	3
CSIS85	Web Development and Design	3
DM110 or	Interactive Animation: Flash	3
CSIS110	Interactive Animation: Flash	3
CSIS78	Web Sites with SOL and PHP	4

RECOMMENDED ELECTIVE:
MATH233	Intermediate Algebra	5

FOR ASSOCIATE DEGREE, COMPLETE
GENERAL EDUCATION REQUIREMENTS (35-39 UNITS)

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 a counselor for details.

NOTE: A course may be used to satisfy both general educationand major courses. See"Double Counting Rule".
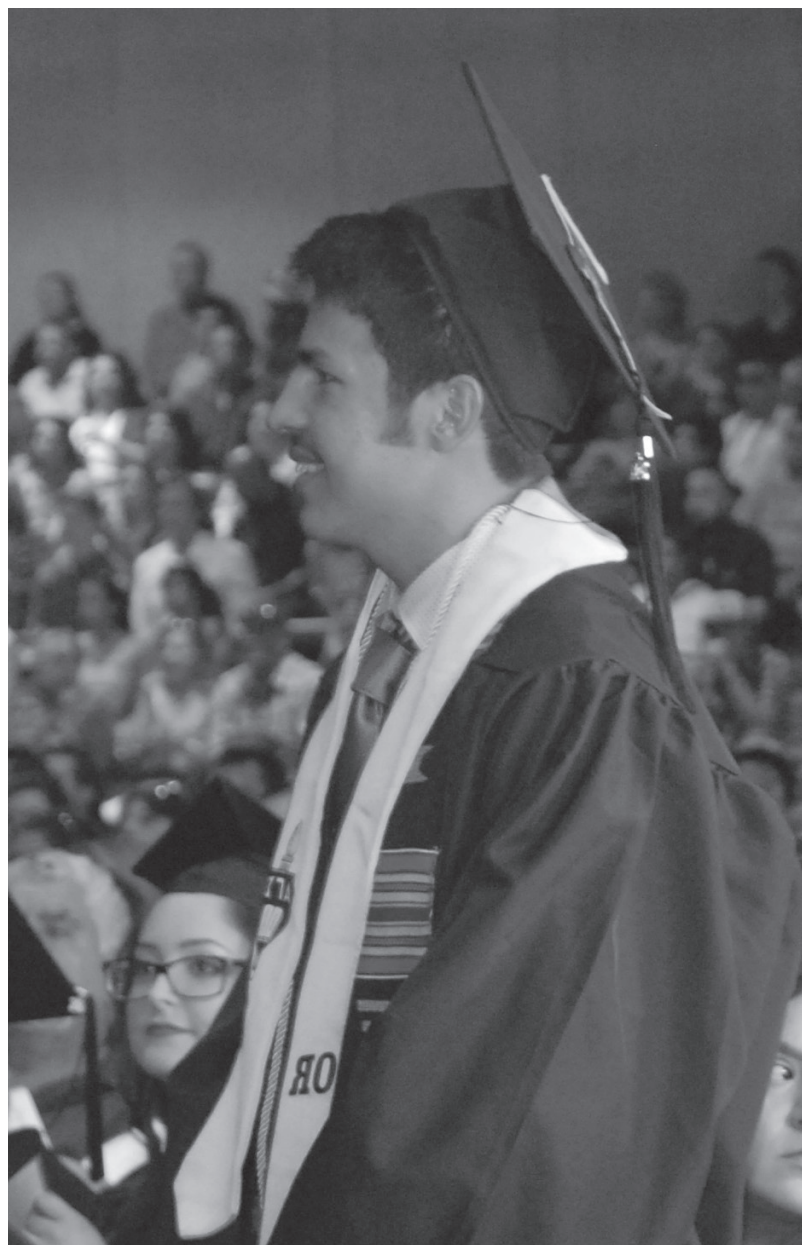
COMPUTER SCIENCE AND INFORMATION SYSTEMS

Scientific Programming
A.S. DEGREE: 60 units
CERTIFICATE OF ACHIEVEMENT: 25 - 28 units

DESCRIPTION

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

Upon successful completion of this program, students 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.

REQUIREMENTS: (25 - 28 UNITS)
CSIS46	C++ Programming II	3
MATH1A	Single-Variable Calculus and Analytic Geometry	4

CHOOSE ONE:
CSIS5	C++ Scientific Programming	3
CSIS45	C++ Programming I	3

CHOOSE TWO:
CSIS24	Java Programming I	3
CSIS47	Visual C++ Programming	3
CSIS51	Visual Basic Programming	4
CSIS54	Perl Programming	3
CSIS54L	Perl Programming Lab	1

CHOOSE TWO:
MATH1B	Single-Variable Calculus and Analytic Geometry	4
MATH5	Introduction to Statistics	3
MATH7	Finite Mathematics	3
CSIS26	Discrete Structures	3

FOR ASSOCIATE DEGREE, COMPLETE 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 a counselor for details.

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

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UNIX Operating System
A.S. DEGREE: 60 units
CERTIFICATE OF ACHIEVEMENT: 23 - 24 units

DESCRIPTION

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, *CIC++* programming.

PROGRAM LEARNING OUTCOMES

Upon successful completion of this program, students 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.

REQUIREMENTS : (23-24 UNITS)
CSIS48	UNIX/Linux Operating System	4
CSIS49	UNIX/Linux Shell Programming	4

CHOOSE ONE:
CSIS18	UNIX/C++ Programming	3
CSIS18L	UNIX/C++ Programming Lab	1
CSIS45	C++ Programming I	3
CSISS	C++ Scientific Programming	3

CHOOSE TWO:
CSIS24	Java Programming I	3
CSIS46	C++ Programming II	3
CSIS54	Perl Programming	3
CSIS54L	Perl Programming Lab	1

FOR ASSOCIATE DEGREE, COMPLETE 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 a counselor for details.

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

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