

Computer Information Systems

Departments of Applied Technology, CIS/ Electronics, and Administration of Justice

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General Description

Computer information systems is the study of the history, theories, principles, processes, procedures, structures, designs, applications, programs, languages, and management of modern information systems and technology. This department explores computer skills, data entry operations, information manipulation, control and data structures, software capabilities, program development, database management, design processes, Web applications, operating systems, and system analysis.

Career Options

Following is a sample of the career options available for computer information systems majors. Most require an associate in science degree, some require a bachelor's degree, and a few require a graduate-level degree: computer operator, data technician, systems analyst, computer maintenance technician, programmer, systems test engineer, software technician, documentation specialist, local area network (LAN) administrator, personal computer (PC) specialist, Web designer, database designer, and eCommerce technician and administrator positions available in allied professions of computer science, business, and industry.

Degree/Certificate Options

Associate in Arts Degree: Transfer Preparation

Information Systems	01130
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Associate in Science Degree: Career/Technical

CIS—Computer Programming With an Emphasis on Applications	02273
CIS—eCommerce Emphasis	02071
CIS—Internet Emphasis	02083
CIS—Internetwork Technician Emphasis	02088
CIS—Microcomputer Applications Emphasis	02335
CIS—Operations/PC Support Specialist Emphasis	02079
CIS—Systems Programming Emphasis	02090
CIS—Web Flash Developer and Gaming Animator	02129
CIS—Web Site Designer and Developer	02121
CIS—Web Site eCommerce Administrator	02127
Microcomputer Office and Technical Support Skills	02331

Certificates of Achievement

CIS—Computer Programming With an Emphasis on Applications—Basic	02274
CIS—Computer Programming With an Emphasis on Applications—Advanced	02275
CIS—eCommerce Emphasis—Advanced	02073
CIS—Entry-Level Database Administrator	02017
CIS—Internet Emphasis—Advanced	02093
CIS—Internetwork Technician Emphasis—Advanced	02097

CIS—Microcomputer Applications Emphasis—Advanced	02338
CIS—Operations/PC Support Specialist Emphasis—Advanced	02098
CIS—Systems Programming Emphasis	02099
CIS—Web Flash Developer and Gaming Animator	02134
CIS—Web Site Designer and Developer	02122
CIS—Web Site eCommerce Administrator	02128
Microcomputer Office and Technical Support Skills—Advanced	02141

Certificates of Proficiency

CIS—eCommerce Emphasis—Basic	02072
CIS—Internet Emphasis—Basic	02074
CIS—Internetwork Technician Emphasis—Basic	02089
CIS—Microcomputer Applications Emphasis—Basic	02337
CIS—Operations/PC Support Specialist Emphasis—Basic	02082
CIS—Web Database Programmer/Administrator—LAMP (Linux, Apache, MySQL, PHP)	02107
CIS—Web Designer	02108
CIS—Web Flash Designer	02109
C++ Certificate	01064
Microcomputer Office and Technical Support Skills—Basic	02139
Project Management	02276
Software Quality Assurance	02013

Consult with a counselor to develop a Student Education Plan (SEP), which lists the courses necessary to achieve your academic goal.



ASSOCIATE IN ARTS DEGREE



Information Systems

Transfer Preparation * (Major Code: 01130)

Prepares students for many job opportunities needing skills in computer programming, systems analysis, end user application development, and administrative management. There is a demand for computer information system knowledge and skills for positions in finance, accounting and auditing, manufacturing, and marketing.

ACCT 101	Principles of Accounting I	4
ACCT 102	Principles of Accounting II—Managerial	4
BUS 140	Business Law/The Legal Environment of Business	3
BUS 212	Business Communication	3
CIS 101	Introduction to Computers and Information Processing	4
ECON 101	Principles of Economics I	3
ECON 102	Principles of Economics II	3
MATH 119	Elementary Statistics	4
MATH 120	Calculus for Business Analysis	4
Total units		32

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

* Students planning to transfer to a four-year college or university should complete courses specific to the transfer institution of choice. University requirements vary from institution to institution and are subject to change. Therefore, it is important to verify transfer major preparation and general education requirements through consultation with a counselor in either the Counseling Center or Transfer Center. **See catalog TRANSFER COURSES INFORMATION section on page 33 for further information.**

ASSOCIATE IN SCIENCE DEGREE



CIS—Computer Programming With an Emphasis on Applications

Career Technical (Major Code: 02273)

Provides training in the theory and practice of computer programming and software design emphasizing business and computer applications. Prepares students for employment in the programming field and provides a strong foundation for students who desire to transfer to work toward a bachelor's degree in the area of information technology (IT).

BUS 120	Introduction to Business	
OR		
BUS 134	eBusiness I: Principles of Electronic Commerce	3
BUS 142	Business Ethics—Corporate and Personal	1
BUS 183	Business Mathematics	3
BUS 211	Communication in Business and Industry	
OR		
BUS 212	Business Communication	3
CIS 101	Introduction to Computers and Information Processing	4
CIS 106	Programming Logic and Design	3
CIS 115	Introduction to Programming Using C++	4
CIS 130	Microcomputer Disk Operating System	1
CIS 146	Introduction to Structured Query Language (SQL)	2
CIS 167	Quality Assurance and Software Testing	3
CIS 226	Operating Systems and Command Languages	3
CIS/BUS 239	Project Management	3
CIS 290–291	Work Experience CIS Applications I–II (2–4)	2–4

Plus Group A and Group B 22

Group A—Open Source (10)

CIS 108	PHP (Personal Home Page) and MySQL (6)
CIS 153	Internet Programming Using Java/J++ (4)

Group B: Microsoft (12)

CIS 117	Windows Programming Using Visual BASIC (4)
CIS 139	Windowing Environments (1)
CIS 166	C# Programming (3)

Total units 57–59

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

Computer Information Systems

Career/Technical

Common Core

BUS 211	Communication in Business and Industry	3
OR		
BUS 212	Business Communication	
BUS 290–293	Work Experience in Business I–IV (2–4)	2–4
CIS/ELEC 10A	Microcomputer Repair and Service	2
CIS 101	Introduction to Computers and Information Processing	4
CIS 130	Microcomputer Disk Operating System	1
CIS 139	Windowing Environments	1
CIS 150	Introduction to Telecommunications and the Internet	1
CIS 226	Operating Systems and Command Languages	3
Total units		17–19

Plus at least one emphasis below

CIS—eCommerce Emphasis

Career/Technical (Major Code: 02071)

The objective of the eCommerce curriculum is to prepare students for entry-level employment in the eCommerce industry. The curriculum is designed to provide students with basic and advanced eCommerce knowledge, along with the skills necessary to design, maintain, and administer a Web-based eCommerce site.

Students will understand the complexities of the marketplace for eCommerce and will become familiar with the legal and regulatory issues that affect eCommerce. Students will gain an understanding of the issues surrounding privacy, security, and the protection of intellectual property.

BUS 134	eCommerce I: Principles of Electronic Commerce	3
CIS 146	Introduction to Structured Query Language (SQL)	2
CIS 103A	eCommerce IIIa—Miva Merchant Online Stores Using Fireworks (4)	
OR		3–4
CIS 104	eCommerce IV—Beginning ColdFusion (3)	
Plus Common Core courses for Computer Information Systems		17–19
Total units		25–28

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

CIS—Internet Emphasis

Career/Technical (Major Code: 02083)

Designed to provide students with a fundamental understanding of Web pages for the Internet.

The objective of the curriculum is to prepare students for employment as Internet specialists, by learning how Internet technology can be used to re-engineer business processes. Students will gain programming, art, and telemedia skills using applications that are geared for designing World Wide Web pages. The Internet specialist designs a plan that specifies how a Web site integrates with a company's existing infrastructure, and is also well versed in developing and managing sophisticated Web projects.

ART 192	Introduction to Digital Imaging	3
CIS/LIB 151	Research Using the Internet	1
CIS 152	Using XHTML and CSS to Create Web Pages	1
CIS 158	Imaging for the World Wide Web (Photoshop and ImageReady)	3
TELE/ART 131	Introduction to Video and Film Production	3
TELE 163	Video Post-production and Special Effects	3
Plus Common Core courses for Computer Information Systems		17–19

Total units **34–36**

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

CIS—Internetwork Technician Emphasis

Career/Technical (Major Code: 02088)

Provides intensive training in the theory and practice of the operation and maintenance of internetworking with special emphasis on switches, routers, and other specialized equipment. The objectives of the curriculum are to prepare students for employment as certified level technicians in the Internetworking industry.

CIS/ELEC 142	Networking Academy Fundamentals (Cisco Certification Preparation)	3
CIS 144A	Routers and Internetwork Fundamentals (Cisco Certification Preparation)	3
CIS 144B	Advanced Routers and LAN Networking	3
CIS 144C	Wide Area Networks Implementation and Support	3
CIS 147	Network Security	3
ELEC 15	Data, Voice, and Video Cable Installation	2
ELEC 260	Microcomputer Systems and A+ Certification	4
ELEC 266	Network Management for Technicians	4
Plus Common Core courses for Computer Information Systems		17–19

Total units **46–48**

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.



Some courses within this program may require additional coursework that must be completed prior to enrollment in those courses. Please consult the individual course listings for prerequisites and any other limitations on enrollment.

CIS—Microcomputer Applications Emphasis

Career/Technical (Major Code: 02335)

Designed for those students with no prior computer experience who want to learn how to use the computer as a business and personal tool. Some vocational opportunities are accounting clerk, data entry clerk, bookkeeper, administrative assistant, general office clerk, and small office data processor.

Students will gain computer skills such as using appropriate office applications software, programming, and familiarity with information systems concepts in a microcomputer environment. Students should have typing skills or should complete *BUS 70 Keyboarding I, as their first course of the program.

BUS 120	Introduction to Business	3
CIS/ ELEC 10B	Microcomputer Hardware and Software Upgrade	2
CIS 121B	Word Processing—Microsoft Word	1
CIS 122B	Spreadsheet Software—Excel	1
CIS 133	Advanced Microcomputer Spreadsheets Software	1
CIS 134	Microcomputer Database Software—Access	1
CIS 137	Advanced Word Processing Software	1
CIS 146	Introduction to Structured Query Language (SQL)	2
Plus Common Core courses for Computer Information Systems		17–19
Total units		29–31

Recommended Electives: ACCT 12, 101; * BUS 70; CIS 115, 117.

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

* Students should have typing skills or should complete BUS 70 Keyboarding I, as their first course of the program.

CIS—Operations/PC Support Specialist Emphasis

Career/Technical (Major Code: 02079)

Designed for strong background in micro and supermini computer operations and support. Students will learn hardware and software installation, the maintenance and repair of PCs and peripherals, and local area networking. Vocational opportunities include, but are not limited to, entry-level PC support specialist, computer operations, and network operations.

ELEC 109/ CIS 119	Office Support and Network Technician (6)	
OR		6
CIS/ELEC 10B	Microcomputer Hardware and Software Upgrade (2)	
CIS/ELEC 14	Office Automation Equipment Repair (2)	
ELEC 15	Data, Voice, and Video Cable Installation (2)	
CIS/ELEC 142	Networking Academy Fundamentals (Cisco Certification Preparation)	3
ELEC 260	Microcomputer Systems and A+ Certification	4
Plus Common Core courses for Computer Information Systems		17–19
Total units		30–32

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

CIS—Systems Programming Emphasis

Career/Technical (Major Code: 02090)

Provides training in the theory and practice of computer programming emphasizing industrial, business, and scientific applications. Prepares students for employment as entry-level programmers, system level software integrators (mini/micro environments), or software error recovery test and acceptance personnel using a variety of system software resources and associated techniques.

CIS 106	Programming Logic and Design	3
CIS 115	Introduction to Programming Using C++	4
CIS 117	Windows Programming Using Visual BASIC	4
CIS 153	Internet Programming Using Java/J++	4
Plus Common Core courses for Computer Information Systems		17–19
Total units		36–38

Recommended Electives: CIS 133, 137; MATH 140.

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

CIS—Web Flash Developer and Gaming Animator

Career/Technical (Major Code: 02129)

Prepares students to work in a computer animation studio, Web design firm, gaming firm, or to work independently as a freelance animator. Students will create interactive video games and Web sites using Flash ActionScript.

BUS 134	eBusiness I: Principles of Electronic Commerce	3
BUS 211	Communication in Business and Industry	3
CIS 124	Web Imaging With Fireworks	6
CIS 125	Flash Motion Graphics	6
CIS 126	Advanced Flash ActionScript	6
CIS 162	Web Site Universal Design	2
CIS 290–291	Work Experience CIS Applications I–II (2–4)	2–4
Total units		28–30

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

CIS—Web Site Designer and Developer

Career/Technical (Major Code: 02121)

Prepares students to work in web design studios, computer firms, or as independent freelance Web designers or search engine marketers. Creates dynamic Web sites using Dreamweaver with Cascading Style Sheets (CSS) and open-source shopping cart software. Develops maximum search engine visibility. Formats web sites for computer and portable devices.

BUS 134	eBusiness I: Principles of Electronic Commerce	3
BUS 211	Communication in Business and Industry	3
CIS 123	Web Publishing With Dreamweaver	6
	OR	
CIS 108	PHP (Personal Home Page) and MySQL	6
CIS 124	Web Imaging With Fireworks	
CIS 162	Web Site Universal Design	2
CIS 255	Web Search Engine Visibility	2
CIS 256	Web Shopping Cart With Advanced Dreamweaver	3
CIS 290–293	Work Experience CIS Applications I–IV (2–4)	2–4
Total units		27–29

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

CIS—Web Site eCommerce Administrator

Career/Technical (Major Code: 02127)

Designed to prepare students to work as a Web site eCommerce administrator installing and implementing eCommerce software using open source and Macromedia/Miva implementations.

BUS 134	eBusiness I: Principles of Electronic Commerce	3
BUS 211	Communication in Business and Industry	3
CIS 108	PHP (Personal Home Page) and MySQL	6
CIS 109	Linux Operating System and Apache Web Server	6
CIS 123	Web Publisher With Dreamweaver	6
CIS 162	Web Site Universal Design	2
Total units		26

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.

Microcomputer Office and Technical Support Skills

Career Technical (Major Code: 02331)

Trains students for positions as computer and technical support specialists to work in today's highly technical office environment.

BUS 120	Introduction to Business	3
	OR	
BUS 134	eBusiness I: Principles of Electronic Commerce	1
BUS 142	Business Ethics—Corporate and Personal	
BUS 183	Business Mathematics	3
BUS 211	Communication in Business and Industry	3
	OR	
BUS 212	Business Communication	2
CIS/ELEC 10A	Microcomputer Repair and Service	
CIS/ELEC 10B	Microcomputer Hardware and Software Upgrade	2
CIS 101	Introduction to Computers and Information Processing	4
CIS 117	Windows Programming Using Visual BASIC (4)	2–4
	OR	
CIS 146	Introduction to Structure Query Language (SQL) (2)	1
CIS 133	Advanced Microcomputer Spreadsheets Software	
CIS 139	Windows Environments	1
CIS 150	Introduction to Telecommunications and the Internet	1
CIS 152	Using XHTML and CSS to Create Web Pages	1
CIS 165	JavaScript Programming	3
CIS 290–291	Work Experience CIS Applications I–II (2–4)	2–4
Total units		29–33

To earn an associate degree, additional general education and graduation requirements must be completed. See page 51.



Some courses within this program may require additional coursework that must be completed prior to enrollment in those courses. Please consult the individual course listings for prerequisites and any other limitations on enrollment.

CERTIFICATES

CIS—Computer Programming With an Emphasis on Applications—Basic

Certificate of Achievement

Career/Technical (Major Code: 02274)

Provides training in the theory and practice of computer programming emphasizing business and computer applications. Prepares students for employment as entry-level programmers or programmer aides and provides a foundation for students who wish to prepare for a career in the field of information technology.

BUS 70	Keyboarding I	1
CIS 101	Introduction to Computers and Information Processing	4
CIS 106	Programming Logic and Design	3
CIS 115	Introduction to Programming Using C++	4
CIS 130	Microcomputer Disk Operating System	1
CIS 146	Introduction to Structure Query Language (SQL)	2
CIS 167	Quality Assurance and Software Testing	3
CIS 226	Operating Systems and Command Languages	3
Total units		21

CIS—Computer Programming With an Emphasis on Applications—Advanced

Certificate of Achievement

Career/Technical (Major Code: 02275)

Provides training in the theory and practice of computer programming emphasizing business and computer applications. Prepares students for employment as beginning- to intermediate-level programmers and provides a foundation for students who wish to transfer to a four-year university to study for a career in informational technology (IT).

BUS 210	Business English	
OR		3
BUS 211	Communication in Business and Industry	
OR		
BUS 212	Business Communication	
CIS 101	Introduction to Computers and Information Processing	4
CIS 106	Programming Logic and Design	3
CIS 115	Introduction to Programming Using C++	4
CIS 130	Microcomputer Disk Operating System	1
CIS 146	Introduction to Structured Query Language (SQL)	2
CIS 167	Quality Assurance and Software Testing	3
CIS 226	Operating Systems and Command Languages	3
CIS/BUS 239	Project Management	3
CIS 290–291	Work Experience CIS Applications I–II (2–4)	2–4

Complete one of the following groups:

Group A—Open Source (10)

CIS 108 PHP (Personal Home Page) and MySQL (6)

CIS 153 Internet Programming Using Java/J++ (4)

OR

10–12

Group B—Microsoft (12)

CIS 117 Windows Programming Using Visual BASIC (4)

CIS 139 Windowing Environments (1)

CIS 166 C# Programming (3)

Total units

38–42

CIS—eCommerce Emphasis—Basic

Certificate of Proficiency

Career/Technical (Major Code: 02072)

BUS 134	eBusiness I: Principles of Electronic Commerce	3
CIS 146	Introduction to Structured Query Language (SQL)	2
CIS 103A	eCommerce IIIa—Miva Merchant Online Stores Using Fireworks (4)	4
Total units		9

CIS—eCommerce Emphasis—Advanced

Certificate of Achievement

Career/Technical (Major Code: 02073)

BUS 134	eCommerce I: Principles of Electronic Commerce	3
CIS 146	Introduction to Structured Query Language (SQL)	2
CIS 103A	eCommerce IIIa—Miva Merchant Online Stores Using Fireworks (4)	4
Plus Common Core courses for Computer Information Systems		17–19
Total units		26–28

CIS—Entry-Level Database Administrator

Certificate of Achievement

Career/Technical (Major Code: 02071)

Prepares students to work as a first-level database administrator within mainframe or distributed computing environments (Oracle Academy hosted).

BUS 96	Customer Service and Communication Techniques	1
BUS 290–293	Work Experience in Business I–IV (2–4)	2–4
CIS 168A	Database Design	5
CIS 168B	Database Programming with SQL	5
CIS 168C	Database Programming with PL/SQL	5
Total units		18–20

CIS—Internet Emphasis—Basic

Certificate of Proficiency

Career/Technical (Major Code: 02074)

CIS/LIB 151	Research Using the Internet	1
CIS 152	Using XHTML and CSS to Create Web Pages	1
CIS 158	Imaging for the World Wide Web (Photoshop and ImageReady)	3
Total units		5

CIS—Internet Emphasis—Advanced

Certificate of Achievement

Career/Technical (Major Code: 02093)

ART 192	Introduction to Digital Imaging	3
CIS/LIB 151	Research Using the Internet	1
CIS 152	Using XHTML and CSS to Create Web Pages	1
CIS 158	Imaging for the World Wide Web (Photoshop and ImageReady)	3
TELE/ART 131	Introduction to Video and Film Production	3
TELE 163	Video Post-production and Special Effects	3
Plus Common Core courses for Computer Information Systems		17–19
Total units		31–33

CIS—Internetwork Technician Emphasis—Basic

Certificate of Proficiency

Career/Technical (Major Code: 02089)

CIS/ELEC 142	Networking Academy Fundamentals (Cisco Certification Preparation)	3
CIS 144A	Routers and Internetwork Fundamentals (Cisco Certification Preparation)	3
CIS 144B	Advanced Routers and LAN Networking	3
CIS 144C	Wide Area Networks Implementation and Support	3
Total units		12

CIS—Internetwork Technician Emphasis—Advanced

Certificate of Achievement

Career/Technical (Major Code: 02097)

CIS/ELEC 142	Networking Academy Fundamentals (Cisco Certification Preparation)	3
CIS 144A	Routers and Internetwork Fundamentals (Cisco Certification Preparation)	3
CIS 144B	Advanced Routers and LAN Networking	3
CIS 144C	Wide Area Networks Implementation and Support	3
CIS 147	Network Security	3
ELEC 15	Data, Voice and Video Cable Installation	2
ELEC 260	Microcomputer Systems and A+ Certification	4
ELEC 266	Network Management for Technicians	4
Plus Common Core courses for Computer Information Systems		17–19
Total units		42–46



Some courses within this program may require additional coursework that must be completed prior to enrollment in those courses. Please consult the individual course listings for prerequisites and any other limitations on enrollment.

CIS—Microcomputer Applications Emphasis—Basic

Certificate of Proficiency

Career/Technical (Major Code: 02337)

BUS 70	Keyboarding I *	1
BUS 120	Introduction to Business	3
CIS/ ELEC 10A	Microcomputer Repair and Service	2
CIS 121B	Word Processing—Microsoft Word	1
CIS 122B	Spreadsheet Software—Excel	1
CIS 133	Advanced Microcomputer Spreadsheets Software	1
CIS 134	Microcomputer Database Software—Access	1
CIS 137	Advanced Word Processing Software	1
CIS 139	Windowing Environments	1
CIS 150	Introduction to Telecommunications and the Internet	1
Total units		13

* Students who know touch-typing do not need to take BUS 70.

CIS—Microcomputer Applications Emphasis—Advanced

Certificate of Achievement

Career/Technical (Major Code: 02338)

BUS 120	Introduction to Business	3
CIS/ ELEC 10B	Microcomputer Hardware and Software Upgrade	2
CIS 121B	Word Processing—Microsoft Word	1
CIS 122B	Spreadsheet Software—Excel	1
CIS 133	Advanced Microcomputer Spreadsheets Software	1
CIS 134	Microcomputer Database Software—Access	1
CIS 137	Advanced Word Processing Software	1
CIS 146	Introduction to Structured Query Language (SQL)	2
Plus Common Core courses for Computer Information Systems		17–19
Total units		29–31

CIS—Operations/PC Support Specialist Emphasis—Basic

Certificate of Proficiency

Career/Technical (Major Code: 02082)

ELEC 109/ CIS 119	Office Support and Network Technician (6)	
OR		6
CIS/ELEC 10A Microcomputer Repair and Service (2)		
CIS/ELEC 10B Microcomputer Hardware and Software Upgrade (2)		
CIS/ELEC 14 Office Automation Equipment Repair (2)		
ELEC 15	Data, Voice, and Video Cable Installation (2)	
CIS 139	Windowing Environments	1
CIS/ ELEC 142	Networking Academy Fundamentals (Cisco Certification Preparation)	3
CL 120	Computer Literacy	1
ELEC 260	Microcomputer Systems and A+ Certification	4
Total units		15

CIS—Operations/PC Support Specialist Emphasis—Advanced

Certificate of Achievement

Career/Technical (Major Code: 02098)

ELEC 109/ CIS 119	Office Support and Network Technician (6)	
OR		6
CIS/ELEC 10B Microcomputer Hardware and Software Upgrade (2)		
CIS/ELEC 14 Office Automation Equipment Repair (2)		
ELEC 15	Data, Voice, and Video Cable Installation (2)	
CIS/ELEC 142	Networking Academy Fundamentals (Cisco Certification Preparation)	3
ELEC 260	Microcomputer Systems and A+ Certification	4
Plus Common Core courses for Computer Information Systems		17–19
Total units		30–32

CIS—Systems Programming Emphasis

Certificate of Achievement

Career/Technical (Major Code: 02099)

CIS 106	Programming Logic and Design	3
CIS 115	Introduction to Programming Using C++	4
CIS 117	Windows Programming Using Visual BASIC	4
CIS 153	Internet Programming Using Java/J++	4
Plus Common Core courses for Computer Information Systems		17–19
Total units		32–34

Recommended Electives: CIS 133, 137; MATH 140.

CIS—Web Database Programmer/Administrator—LAMP (Linux, Apache, MySQL, PHP)

Certificate of Proficiency

Career/Technical (Major Code: 02107)

Designed to prepare students to work as a first-level Database/Web Administrator support specialists installing and implementing the Linux, Apache, MySQL, PHP (LAMP) open source software platform.

CIS 108	PHP (Personal Home Page) and MySQL	6
CIS 109	Linux Operating System and Apache Web Server	6
CIS 162	Web Site Universal Design	2
Total units		14

CIS—Web Designer

Certificate of Proficiency

Career/Technical (Major Code: 02108)

Prepares students to work in an Internet Web design studio or to work independently as a freelance project consultant. Students receive training in creating, designing, testing, uploading, and maintaining multimedia Web sites.

CIS 123	Web Publishing with Dreamweaver	6
CIS 124	Web Imaging with Fireworks	6
CIS 162	Web Site Universal Design	2
Total units		14

CIS—Web Flash Designer

Certificate of Proficiency

Career/Technical (Major Code: 02109)

Designed to prepare students to work in computer-animation studios, Web design firms, or to work independently as freelance project consultants. Students will learn to create basic vector and raster images for the Web.

CIS 125	Flash Motion Graphics	6
CIS 126	Advanced Flash ActionScript	6
CIS 162	Web Site Universal Design	2
Total units		14

CIS—Web Flash Developer and Gaming Animator

Certificate of Achievement

Career/Technical (Major Code: 02134)

Prepares students to work in a computer animation studio, Web design firm, gaming firm, or to work independently as a freelance animator. Students will create interactive video games and Web sites using Flash ActionScript.

BUS 134	eBusiness I: Principles of Electronic Commerce	3
BUS 211	Communication in Business and Industry	3
CIS 124	Web Imaging With Fireworks	6
CIS 125	Flash Motion Graphics	6
CIS 126	Advanced Flash ActionScript	6
CIS 162	Web Site Universal Design	2
CIS 290–291	Work Experience CIS Applications I–II (2–4)	2–4
Total units		28–30

CIS—Web Search Engine Marketer

Certificate of Achievement

Career/Technical (Major Code: 02334)

Builds a marketing strategy to ensure top placement of a website in web searches. Provides hands-on introduction to search engine visibility, including optimization techniques, keywords, trends, and measuring tools. Includes designing for portable devices and using social media.

CIS 123	Web Publishing with Dreamweaver	6
OR		
CIS 108	PHP (Personal Home Page) and MySQL	6
CIS 124	Web Imaging with Fireworks	6
CIS 152	Using XHTML and CSS to Create Web Pages	2
CIS 162	Web Site Universal Design	2
CIS 255	Web Search Engine Visibility	2
Total units		18

CIS—Web Shopping Cart Developer

Certificate of Achievement

Career/Technical (Major Code: 02333)

Builds dynamic multimedia websites with shopping cart. Uses open-source software to build an online storefront and catalog. Uses effective business practices and design techniques, follows accessibility standards to sell products online to target consumer audiences. Provides hand-on instruction with multimedia equipment, uploading to the web, and quality control testing.

CIS 123	Web Publishing with Dreamweaver	6
CIS 124	Web Imaging with Fireworks	6
CIS 152	Using XHTML and CSS to Create Web Pages	2
CIS 162	Web Site Universal Design	2
CIS 256	Web Shopping Cart with Advanced Dreamweaver	3
Total units		19



Some courses within this program may require additional coursework that must be completed prior to enrollment in those courses. Please consult the individual course listings for prerequisites and any other limitations on enrollment.

CIS—Web Site Designer and Developer

Certificate of Achievement

Career/Technical (Major Code: 02122)

BUS 134	eBusiness I: Principles of Electronic Commerce	3
BUS 211	Communication in Business and Industry	3
CIS 123	Web Publishing With Dreamweaver	
OR		6
CIS 108	PHP (Personal Home Page) and MySQL	
CIS 124	Web Imaging With Fireworks	6
CIS 152	Using XHTML and CSS to Create Web Pages	2
CIS 162	Web Site Universal Design	2
CIS 255	Web Search Engine Visibility	2
CIS 256	Web Shopping Cart With Advanced Dreamweaver	3
CIS 290–293	Work Experience CIS Applications I–IV (2–4)	2–4
Total units		29–31

CIS—Web Site eCommerce Administrator

Certificate of Achievement

Career/Technical (Major Code: 02128)

BUS 134	eBusiness I: Principles of Electronic Commerce	3
BUS 211	Communication in Business and Industry	3
BUS 290–293	Work Experience in Business I–IV (2–4)	2–4
CIS 108	PHP (Personal Home Page) and MySQL	6
CIS 109	Linux Operating System and Apache Web Server	6
CIS 123	Web Publisher With Dreamweaver	6
CIS 162	Web Site Universal Design	2
Total units		28–30

C++ Certificate

Certificate of Proficiency

Career/Technical (Major Code: 01064)

Provides training in the C++ programming language to prepare for employment in the software industry.

CIS 106	Programming Logic and Design	3
CIS 115	Introduction to Programming Using C++	4
CIS 167	Quality Assurance and Software Testing	3
Total units		10

Microcomputer Office and Technical Support Skills—Basic

Certificate of Proficiency

Career/Technical (Major Code: 02139)

Designed to provide entry-level computer support skills for the automated office environment.

CIS/ ELEC 10A	Microcomputer Repair and Service	2
CIS/ ELEC 10B	Microcomputer Hardware and Software Upgrade	2
CIS 92	Microsoft Office Suite (3)	
OR		3–4
CIS 101	Introduction to Computers and Information Processing (4)	
CIS 139	Windowing Environments	1
CIS 150	Introduction to Telecommunications and the Internet	1

Total units **9–10**

Microcomputer Office and Technical Support Skills—Advanced

Certificate of Achievement

Career/Technical (Major Code: 02141)

Covers advanced computer and technical skills required to support new technologies in today's business office environment.

BUS 210	Business English	
OR		3
BUS 211	Communication in Business and Industry	
OR		
BUS 212	Business Communication	
CIS 117	Windows Programming Using Visual BASIC (4)	
OR		2–4
CIS 146	Introduction to Structure Query Language (SQL) (2)	
CIS 133	Advanced Microcomputer Spreadsheets Software	1
CIS 152	Using XHTML and CSS to Create Web Pages	1
CIS 165	JavaScript Programming	3
CIS 290–291	Work Experience CIS Applications I–II (2–4)	2–4
Plus completion of the courses required for the Microcomputer Office and Technical support—Basic		9–10

Total units **21–26**

Project Management

Certificate of Proficiency

Career/Technical (Major Code: 02276)

Provides training that includes the application of project management skills for employment in industry.

BUS 211	Communication in Business and Industry	
	OR	3
BUS 212	Business Communication	
CIS 167	Quality Assurance and Software Testing	3
CIS 106	Programming Logic and Design (3)	
	OR	3
BUS/CIS 239	Project Management (3)	
Total units		9

Software Quality Assurance

Certificate of Proficiency

Career/Technical (Major Code: 02013)

Provides software quality assurance training and industry software testing techniques to prepare for employment in the software development industry.

CIS 106	Programming Logic and Design	3
CIS 167	Quality Assurance and Software Testing	3
BUS 211	Communication in Business and Industry	
	OR	3
BUS 212	Business Communication	
Total units		9

Computer Science

School of Mathematics, Science, and Engineering

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Department Chair Alexander Juden, M.S.

General Description

Computer science is the youngest of the sciences and focuses on the study of computer software, architecture, theory, and applications. This discipline explores computing theory and symbolic computation, the nature of computer architecture and operating systems, data communications, graphics, software engineering, mathematical applications, robotics, artificial intelligence, and system software.

There are many curriculum choices open to students interested in the science of computers. Students interested in the hardware aspect of computers should look at the vocational and transfer courses offered in engineering and electronics programs. Students interested in the operations aspect of computers should review the programs offered in computer information systems and computer literacy courses.

The Computer science program at SWC focuses on the programming or software aspect of computer science and offers three academic pathways from which to choose:

- * Transfer preparation associate degree for students who plan to transfer and major in computer science
- * Career/Technical associate degree for students seeking employment at the technician level in science or mathematics fields
- * Career/Technical certificate

Career Options

Below is a sample of the career options available for the computer science major. A few of these require an associate in arts degree, most require a bachelor's degree, and some require a graduate-level degree: computer scientist, systems analyst, computer service coordinator, software engineer, computer graphic specialist, high school or college teacher, data base administrator, researcher, program analyst, teleprocessing coordinator, knowledge engineer, technical control specialist, systems manager, data processing application programmer, information specialist and positions available in allied professions of business, industry, and scientific technology.



Some courses within this program may require additional coursework that must be completed prior to enrollment in those courses. Please consult the individual course listings for prerequisites and any other limitations on enrollment.