

COMPUTER AND INFORMATION SCIENCE

See *Business Office Technology for specific Microsoft applications (Word, Excel, PowerPoint, etc.)*.

CAREER OPPORTUNITIES

Communications Specialist
 Computer Game Programmer
 Computer Hardware Specialist
 Computer Help Desk Technician
 Computer Maintenance Technician
 Computer Software Technician
 Computer Support Specialist
 *Computer Systems Analyst
 *Computing Analyst
 Cyber Security Specialist
 *Database Manager
 Information Specialist
 *Information Systems Programmer
 LAN/WAN Manager
 Manufacturer's Representative
 Network Administrator
 *Network Analyst
 Network Consultant
 Network Control Technician
 Network Training and Support Specialist
 *Programmer Analyst
 Sales and Service
 *Scientific Programmer
 Software Consultant
 *Software Developer
 *Systems Analyst
 *Systems Programmer
 Technical Support Representative
 *Telecommunications Programmer
 Telecommunications Technician
 *Telecommunications Technical Engineer
 Training Specialist
 Web Designer
 Web Developer
 *Bachelor Degree or higher required

Similar Course List:

The following Cuyamaca and Grossmont College courses are considered similar enough to be accepted in the major for local computer science degrees in the district. Modification of Major forms are not required.

<i>Cuyamaca Course</i>	<i>Grossmont Course</i>
CIS 105	CSIS 172
CIS 120.....	CSIS 114
CIS 140.....	CSIS 180
CIS 190	CSIS 112
CIS 191.....	CSIS 113
CIS 211.....	CSIS 132
CIS 213.....	CSIS 133
CIS 215.....	CSIS 135
CIS 240	CSIS 276
CIS 267	CSIS 281, 282
CS 119.....	CSIS 119
CS 181.....	CSIS 296
CS 182.....	CSIS 293
CS 281.....	CSIS 297
CS 282	CSIS 294

I. NETWORKING, SECURITY AND SYSTEM ADMINISTRATION

These degree programs prepare students for careers in computer networking or system administration and related fields. Upon completion, students may find entry level positions as computer support technicians, junior network administrators, junior system administrators, hardware technicians, data/voice/video cabling technicians, network project managers, designers/estimators or technical support personnel. The major prepares students to work as team members in an information technology group which designs, evaluates, tests, installs and maintains corporate networks. Preparation for the following industry certifications: A+, Network+, Security+, Linux+, Microsoft Certified Technician (MCT) in Windows and Windows Server (active directory, network infrastructure and applications infrastructure), Linux Profession Institute Certification Level 2, Certified Wireless Network Administrator (CWNA), Cisco Certified Network Associate (CCNA), Certified Ethical Hacking (CEH).

A. NETWORKING, SECURITY AND SYSTEM ADMINISTRATION - ENTERPRISE NETWORKING

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Install, configure, upgrade, diagnose and troubleshoot a personal computer and its associated networking hardware and software in accordance with industry standards.

Associate in Science Degree Requirements: Core Curriculum:

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 125	Network+ Certification	3
CS 119	Program Design and Development	3
CS 119L	Program Design and Development Lab	1
		13

Area of Emphasis:

CIS 190	Windows Operating System	3
or		
CIS 191	Linux Operating System	3
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
CIS 203	Cisco Networking Academy III	3
CIS 204	Cisco Networking Academy IV	3
CIS 209	Cisco Networking Academy IX	3
or		
CIS 263	Fundamentals of Network Security	3
		18

Select three of the following:

CIS 210	Cisco Networking Academy-Voice	4
CIS 261	NSSA Degree Capstone	2
CIS 262	Wireless Networking	3
CIS 264	Ethical Cybersecurity Hacking	3
CIS 265	Computer Forensics	3
		8-10
	Total Required Including Core Classes	39-41
	Plus General Education Requirements	

Certificate of Achievement

Students who complete only the courses required for the major including an area of emphasis qualify for a Certificate in Networking, Security and System Administration - Enterprise Networking. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

B. NETWORKING, SECURITY AND SYSTEM ADMINISTRATION - ENTERPRISE SYSTEM ADMINISTRATION

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Install, configure, upgrade, test, and troubleshoot a personal computer (hardware, system software, and networking hardware and software) and Linux and Windows servers (directory services, networking, print services, server security, remote access, DNS, DHCP, web server, file server, mail server, FTP server, file systems, partitions, logical volumes, server/network performance, and data backup and recovery).

Associate in Science Degree Requirements:

Core Curriculum:

<i>Course</i>	<i>Title</i>	<i>Units</i>
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 125	Network+ Certification	3
CS 119	Program Design and Development	3
CS 119L	Program Design and Development Lab	1
		13

Area of Emphasis:

CIS 190	Windows Operating System	3
CIS 191	Linux Operating System	3
CIS 290	Windows Server-Installing and Configuring	2
CIS 291	Linux System Administration	3
CIS 293	Windows Server-Administering	2
CIS 294	Windows Server-Advanced Configuration	2
		15

Select four of the following:

CIS 140	Databases	3
CIS 162	Technical Diagramming Using Microsoft Visio	2
CIS 261	NSSA Degree Capstone	2
CIS 263	Fundamentals of Network Security	3
CIS 264	Ethical Cybersecurity Hacking	3
CIS 265	Computer Forensics	3
CIS 295	VMware Certified Professional	3
		10-12

Total Required Including Core

Classes 38-40
 Plus General Education Requirements

Certificate of Achievement

Students who complete only the courses required for the major including an area of emphasis qualify for a Certificate in Networking, Security and System Administration - Enterprise System Administration. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

II. WEB DEVELOPMENT

This degree program equips students with the essential coding, programming, and design skills needed to build websites and applications for desktop and mobile platforms. Students gain practical experience using state of the art web development technology to prepare for entry-level positions as web developers. The curriculum is continually updated to respond to rapidly changing industry trends.

Program Learning Outcomes

Upon successful completion of this program, students will be able to:

- Develop attractive, usable, mobile-friendly websites using current development

technologies such as HTML/CSS, JavaScript, PHP/MySQL, frameworks, and content management systems.

Associate in Science Degree Requirements:

Course	Title	Units
CIS 140	Databases	3
CIS 211	Web Development I	3
CIS 213	Web Development II	3
CIS 215	JavaScript Web Programming	3
CIS 219	PHP/MySQL Dynamic Web-Based Applications	3
CS 119	Program Design and Development	3
CS 119L	Program Design and Development Lab	1
GD 105	Fundamentals of Digital Media	3
		<u>22</u>

Select one of the following:

CIS 225	Web Development Capstone	3
CIS 267	Directed Work Experience in CIS	1-4
		<u>1-4</u>

Select two of the following:

CIS 110	Principles of Information Systems	4
CIS 191	Linux Operating System	3
CS 182	Introduction to Java Programming	4
GD 126	Adobe Photoshop Digital Imaging	3
GD 130	Professional Business Practices	3
GD 217	Web Graphics	3
GD 222	Web Animation	3
		<u>6-8</u>
	Total Required	29-34
	Plus General Education Requirements	

Certificate of Achievement

Students who complete only the major requirements above qualify for a Certificate in Web Development. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

CERTIFICATES OF SPECIALIZATION:

These certificates offer specific training for either entry-level positions or to augment related programs such as Network Administration, Web Development, Business Office Technology or Graphic Design. The certificates are designed to demonstrate a relatively narrow expertise or skill area that may be used to attain a computer industry "niche" job.

Students who complete the requirements below qualify for a certificate in that area of emphasis. An official request must be filed with the Admissions and Records Office prior to the deadline as stated in the Academic Calendar.

I. CISCO CERTIFIED NETWORK ASSOCIATE

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Plan, design, configure, test, and troubleshoot network topologies consisting of routers, switches, wireless routers, and PCs using: the Cisco IOS CLI; ip addressing; interior gateway protocols; HDLC, PPP and Frame-Relay WAN protocols; VLANs; NAT; DHCP; router and switch security techniques.

Certificate Requirements:

Course	Title	Units
CIS 201	Cisco Networking Academy I	3
CIS 202	Cisco Networking Academy II	3
CIS 203	Cisco Networking Academy III	3
CIS 204	Cisco Networking Academy IV	3
CIS 209	Cisco Networking Academy IX	3
	Total Required	<u>15</u>

II. CISCO NETWORK PROFESSIONAL

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Configure, diagnose, and troubleshoot complex enterprise router and switch networking solutions including: network performance; advanced routing protocols; VPNs; IPv6; advanced VLAN topologies; high availability and redundancy protocols; and LAN security.

Certificate Requirements:

Course	Title	Units
CIS 205	Implementing Cisco IP Routing (Route)	3
CIS 206	Cisco Networking Academy VI	3
CIS 207	Cisco Networking Academy VII	3
CIS 208	Cisco Networking Academy VIII	3
	Total Required	<u>12</u>

III. COMPUTER PROGRAMMING

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Be proficient in at least one high-level programming language and an ability to use that language to implement software solutions in a variety of settings following the systems development life cycle (SDLC).

Certificate Requirements:

Course	Title	Units
CS 119	Program Design and Development	3
CS 119L	Program Design and Development Lab	1
CS 181	Introduction to C++ Programming	4
	or	
CS 182	Introduction to Java Programming	4
CS 281	Intermediate C++ Programming and Fundamental Data Structures	4
	or	
CS 282	Intermediate Java Programming and Fundamental Data Structures	4
	Total Required	<u>12</u>

IV. COMPUTER SUPPORT TECHNICIAN

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Describe and demonstrate the ability to install, configure, upgrade, diagnose and troubleshoot a personal computer and its associated networking hardware and system software.

Certificate Requirements:

Course	Title	Units
CIS 120	Computer Maintenance and A+ Certification	3
CIS 121	Network Cabling Systems	3
CIS 125	Network+ Certification	3
CIS 190	Windows Operating System	3
CIS 191	Linux Operating System	3
	Total Required	<u>15</u>

V. CYBER SECURITY SPECIALIST

Program Learning Outcomes

Upon completion of this certificate, students will be able to:

- Perform system scan and reconnaissance to determine vulnerabilities, then create a report showing vulnerabilities and recommendations for rectifying the cited weaknesses.

Certificate Requirements

Course	Title	Units
CIS 125	Network+ Certification	3
CIS 190	Windows Operating System	3
	or	
CIS 191	Linux Operating System	3
CIS 209	Cisco Networking Academy IX	3
	or	
CIS 263	Fundamentals of Network Security	3
CIS 264	Ethical Cybersecurity Hacking	3
CIS 265	Computer Forensics Fundamentals	3
	Total Required	<u>15</u>

VI. WEB DESIGN

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Develop attractive, usable, mobile-friendly websites using current development technologies such as HTML/CSS, frameworks, and content management systems.

Certificate Requirements:

Course	Title	Units
CIS 211	Web Development I	3
CIS 213	Web Development II	3
CIS 225	Web Development Capstone	3
GD 126	Adobe Photoshop Digital Imaging	3
GD 217	Web Graphics	3
	Total Required	<u>15</u>

VI. WEB PROGRAMMING

Program Learning Outcomes

Upon successful completion of this certificate, students will be able to:

- Develop attractive, usable, mobile-friendly websites using current development technologies such as HTML/CSS, JavaScript, PHP/MySQL, frameworks, and content management systems.

Certificate Requirements:

Course	Title	Units
CIS 211	Web Development I	3
CIS 213	Web Development II	3
CIS 215	JavaScript Web Programming	3
CIS 219	PHP/MySQL Dynamic Web-Based Applications	3
CS 119	Program Design and Development	3
CS 119L	Program Design and Development Lab	1
	Total Required	<u>16</u>