

- CSIT 131 Word** (1)  
(Formerly CSIS 127)  
2 hours lecture/laboratory  
**Note:** May be taken 2 times  
**Transfer acceptability:** CSU  
Intended for individuals seeking the fundamental and advanced skills of Microsoft Word word processing software. Prepares individuals who are seeking to become a Microsoft Proficient Specialist and Microsoft Word Expert Specialist.
- CSIT 132 Excel** (1)  
(Formerly CSIS 174)  
2 hours lecture/laboratory  
**Note:** May be taken 2 times  
**Transfer acceptability:** CSU  
Intended for individuals seeking the fundamental and advanced skills of Microsoft Excel spreadsheet software. Prepares individuals who are seeking to become a Microsoft Excel Proficient Specialist and Microsoft Excel Expert Specialist.
- CSIT 133 PowerPoint** (1)  
(Formerly CSIS 185)  
2 hours lecture/laboratory  
**Note:** May be taken 2 times  
**Transfer acceptability:** CSU  
Intended for individuals seeking the fundamental and advanced skills of Microsoft PowerPoint graphics software. Prepares individuals who are seeking to become a Microsoft PowerPoint Expert Specialist.
- CSIT 134 Outlook** (1)  
(Formerly CSIS 188)  
2 hours lecture/laboratory  
**Note:** May be taken 2 times  
**Transfer acceptability:** CSU  
Introduction of fundamental and advanced skills of Microsoft Outlook software. Helps prepare individuals who are seeking to become a Microsoft Outlook Proficient Specialist and Microsoft Outlook Expert Specialist.
- CSIT 135 Access** (1)  
(Formerly CSIS 179)  
2 hours lecture/laboratory  
**Note:** May be taken 2 times  
**Transfer acceptability:** CSU  
Intended for individuals seeking the fundamental and advanced skills of Microsoft Access database software. Helps prepare individuals who are seeking to become a Microsoft Access Proficient Specialist and Microsoft Access Expert Specialist.
- CSIT 170 Visual Basic I** (4)  
(Formerly CSIS 117)  
3 hours lecture-2 hours lecture/laboratory  
**Transfer acceptability:** CSU  
Design, create, test and run computer applications using Visual Basic. Emphasis is on learning the fundamentals of the Visual Basic interface and how to solve problems using structured design logic and the sequence, decision and repetition procedural language control structure. Selected additional features of the Visual Basic interface and procedural language are included to provide a foundation for the study of more advanced courses.
- CSIT 180 C# Programming I** (3)  
(Formerly CSIS 282)  
2 hours lecture-2 hours lecture/laboratory  
**Transfer acceptability:** CSU; UC (pending)  
Provides the knowledge and skills necessary to use the C# programming language in the .NET Framework. Build Windows applications and server-side programs; access data with ADO.NET; use C# with Web Forms and .NET CLR.
- CSIT 197 Topics in Information Technology** (.5-4)  
Units awarded in topics courses are dependent upon the number of hours required of the student. Any combination of lecture, laboratory, or lecture/laboratory may be scheduled by the department. Refer to Class Schedule.
- Note:** May be taken 4 times  
**Transfer acceptability:** CSU  
Topics in Information Technology. See class schedule for specific topic offered. Course title will designate subject covered.
- CSIT 270 Visual Basic II** (4)  
(Formerly CSIS 214)  
3 hours lecture-2 hours lecture/laboratory  
**Prerequisite:** CSIT 170  
**Transfer acceptability:** CSU  
An intermediate-level programming language which provides for building special purpose Windows applications using the Graphical User Interface of Windows. Includes extensive practice using programming logic control structures in designing algorithms and a wide array of Visual Basic objects in implementing the three-step approach to building Windows applications in Visual Basic.
- CSIT 271 Visual Basic III** (4)  
(Formerly CSIS 217)  
3 hours lecture-2 hours lecture/laboratory  
**Prerequisite:** CSIT 270  
**Transfer acceptability:** CSU  
Advanced course in Visual Basic programming. Special emphasis will be placed on the application of the Visual Basic language to solve business problems including requirements definition, design, construction, testing, and documentation. Multiple forms, objects, controls, object linking and embedding (OLE), and the use of the data control object to interface with databases external to Visual Basic will be covered.
- CSIT 280 C# Programming II** (3)  
2 hours lecture-2 hours lecture/laboratory  
**Prerequisite:** CSIT 180  
**Transfer acceptability:** CSU; UC (pending)  
Provides intermediate-level knowledge and skills necessary to use the C# programming language. Topics include language syntax, data types, operators, exception handling, casting, string handling, data structures, collection classes and delegates. Programming of windows-based applications is presented along with object-oriented programming that includes classes, methods, polymorphism and inheritance. Event-driven programming is discussed along with the C# development and execution environment.
- CSIT 290 Systems Analysis and Design** (4)  
(Formerly CSIS 245)  
3 hours lecture-2 hours lecture/laboratory  
**Prerequisite:** CSIT 170 or CSCI 110 or CSCI 220  
**Transfer acceptability:** CSU; UC  
Specific projects, problems, and systems. Application of appropriate programming languages and the use of analytical tools in solving case studies and problems.
- CSIT 295 Directed Study in Information Technology** (1,2,3)  
3, 6, or 9 hours laboratory  
**Prerequisite:** Approval of project or research by department chairperson/director  
**Note:** May be taken 4 times  
**Transfer acceptability:** CSU; UC (pending)  
Designed for the student who has demonstrated a proficiency in Information Technology subjects and the initiative to work independently on a particular sustained project which does not fit into the context of regularly scheduled classes.

## Computer Science and Information Systems - Networking (CSNT)

See also CSIS - Computer Science, CSIS - Database, CSIS - Information Technology, and CSIS - Web Technology

Contact the Computer Science and Information Systems Department for further information.

(760) 744-1150, ext. 2387

Office: ST 6

<http://www.palomar.edu/csis>

**Associate in Arts Degrees -**

AA Degree requirements are listed in Section 6 (green pages).

- Computer Network Administration with Emphasis in Cisco and Linux Management
- Computer Network Administration with Emphasis in Cisco and Microsoft Management
- Computer Network Administration with Emphasis in Microsoft and Linux Management

**Certificates of Achievement -**

Certificate of Achievement requirements are listed in Section 6 (green pages).

- Computer Network Administration with Emphasis in Cisco and Linux Management
- Computer Network Administration with Emphasis in Cisco and Microsoft Management
- Computer Network Administration with Emphasis in Microsoft and Linux Management

**Certificates of Proficiency -**

Certificate of Proficiency requirements are listed in Section 6 (green pages).

- Cisco
- Desktop Support Specialist - MCSA
- Network Engineer - MCSE

**PROGRAMS OF STUDY**

**Cisco**

The Cisco networking program is designed to teach students the skills needed to design, build, and maintain small to medium-sized networks. This provides students the opportunity to enter the workforce and/or further their education and training in the computer-networking field.

**CERTIFICATE OF PROFICIENCY**

Program Requirements		Units
CSNT 160	Cisco Networking Fundamentals	3
CSNT 161	Cisco Router Configuration	3
CSNT 260	Cisco Advanced Routing/Switching	3
CSNT 261	Cisco WAN Design/Support	3

**TOTAL UNITS** 12

**Computer Network Administration with Emphasis in Cisco and Linux Management**

This program prepares the student for employment in the field of Computer Networking. The focus is on developing skills in a combination of the network technologies produced by Cisco and Linux/Unix. Specific learning outcomes include developing team dynamics in the following skills: Network Media Installation, LAN and WAN Design, Network Management, Fundamentals of Networking Devices, Client Hardware Repair, Network Operating Systems Installation and Configuration, Networking Device Operating Systems, Installation and Configuration, Client Operating Systems Installation and Configuration, Network Security, Remote Access, Routing Principles and Configuration, and Maintaining a Corporate Network.

In order to earn a certificate or degree, students must achieve a minimum grade of 'C' in each of the certificate or degree program courses.

**A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT\*\***

Program Requirements		Units
CSNT 110 or R CSIS 155	Hardware and O.S. Fundamentals Computer Technology – Hardware	3
CSNT 111 or CSNT 160 or R CSIS 160	Networking Fundamentals Cisco Networking Fundamentals Introductions to Local Area Networking	3
CSNT 120 or R CSIS 157	Windows Client Windows XP: Professional and Server	3
CSNT 121	Windows Server	3

CSNT 140	Linux Administration	2
CSNT 141	Linux Networking and Security	2
CSNT 161*	Cisco Router Configuration	3
CSNT 180	Wireless Networking	3
CSNT 181 or R CSIS 161	Hacker Prevention/Security PC/Network Security	3
CSNT 260	Cisco Advanced Routing and Switching	3
CSNT 261	Cisco Wide Area Network Design and Support	3
CSCI 105	Survey of Computer Science	4
CSCI 130 or R CSIS 145	Linux Fundamentals Introduction to Linux	2

**TOTAL UNITS** 37 - 38

\* Note: CSNT 160 is a prerequisite for CSNT 161

\*\* Computer Network Administration with Emphasis in Cisco and Linux Management Certificate of Achievement pending approval by the California Community Colleges System Office at the time of catalog publication. A.A. Degree has already been approved.

**Computer Network Administration with Emphasis in Cisco and Microsoft Management**

This program prepares the student for employment in the field of Computer Networking. The focus is on developing skills in a combination of the network technologies produced by Cisco and Microsoft. Specific learning outcomes include developing team dynamics in the following skills: Network Media Installation, LAN and WAN Design, Network Management, Fundamentals of Networking Devices, Client Hardware Repair, Network Operating Systems Installation and Configuration, Networking Device Operating Systems, Installation and Configuration, Client Operating Systems Installation and Configuration, Network Security, Remote Access, Routing Principles and Configuration, and Maintaining a Corporate Network.

In order to earn a certificate or degree, students must achieve a minimum grade of 'C' in each of the certificate or degree program courses.

**A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT\*\***

Program Requirements		Units
CSNT 110 or R CSIS 155	Hardware and O.S. Fundamentals Computer Technology – Hardware	3
CSNT 111 or CSNT 160 or R CSIS 160	Networking Fundamentals Cisco Networking Fundamentals Introductions to Local Area Networking	3
CSNT 120 or R CSIS 157	Windows Client Windows XP: Professional and Server	3
CSNT 121	Windows Server	3
CSNT 161*	Cisco Router Configuration	3
CSNT 180	Wireless Networking	3
CSNT 181 or R CSIS 161	Hacker Prevention/Security PC/Network Security	3
CSNT 221	Windows Infrastructure Administration	3
CSNT 230	Design Windows Active Directory & Infrastructure	2
CSNT 260	Cisco Advanced Routing and Switching	3
CSNT 261	Cisco Wide Area Network Design and Support	3
CSCI 105	Survey of Computer Science	4
CSCI 130 or R CSCI 145	Linux Fundamentals Introduction to Linux	2

**TOTAL** 38 - 39

\* Note: CSNT 160 is a prerequisite for CSNT 161

\*\* Computer Network Administration with Emphasis in Cisco and Microsoft Management Certificate of Achievement pending approval by the California Community Colleges System Office at the time of catalog publication. A.A. Degree has already been approved.

## Computer Network Administration with Emphasis in Microsoft and Linux Management

This program prepares the student for employment in the field of Computer Networking. The focus is on developing skills in a combination of the network technologies produced by Microsoft and Linux/UNIX. Specific learning outcomes include developing team dynamics in the following skills: Network Media Installation, LAN and WAN Design, Network Management, Fundamentals of Networking Devices, Client Hardware Repair, Network Operating Systems Installation and Configuration, Networking Device Operating Systems, Installation and Configuration, Client Operating Systems Installation and Configuration, Network Security, Remote Access, Routing Principles and Configuration, and Maintaining a Corporate Network.

In order to earn a certificate or degree, students must achieve a minimum grade of 'C' in each of the certificate or degree program courses.

### A.A. DEGREE MAJOR OR CERTIFICATE OF ACHIEVEMENT\*

Program Requirements	Units	
CSNT 110 or R CSIS 155	Hardware and O.S. Fundamentals Computer Technology – Hardware	3
CSNT 111 or CSNT 160 or R CSIS 160	Networking Fundamentals Cisco Networking Fundamentals Introductions to Local Area Networking	3
CSNT 120 or R CSIS 157	Windows Client Windows XP: Professional and Server	3
CSNT 121	Windows Server	3
CSNT 140	Linux Administration	2
CSNT 141	Linux Networking and Security	2
CSNT 180	Wireless Networking	3
CSNT 181 or R CSIS 161	Hacker Prevention/Security PC/Network Security	3
CSNT 221	Windows Infrastructure Administration	3
CSNT 224	Active directory Services Administration	3
CSCI 105	Survey of Computer Science	4
CSCI 130 or R CSIS 145	Linux Fundamentals Introduction to Linux	2 3
<b>Group One Electives (Select 2 courses)</b>		
CSNT 222	Managing a Windows Infrastructure	2
CSNT 230	Design Windows Active Directory & Infrastructure	2
CSNT 231	Design Windows Network Security	2
<b>Group Two Electives (Select 1 course)</b>		
CSNT 235	Microsoft Exchange Server	2
CSDB 120	SQL Database Design	2
CSDB 210	SQL Server Administration	2
<b>TOTAL UNITS</b>		<b>38 - 40</b>

Note: By adding CSNT 161, CSNT 260 and CSNT 261 to your Microsoft and Linux Management Emphasis you can also earn a Certificate of Proficiency in Cisco in addition to your Computer Network Administration A.A. Degree.

\* Computer Network Administration with Emphasis in Microsoft and Linux Management Certificate of Achievement pending approval by the California Community Colleges System Office at the time of catalog publication. A.A. Degree has already been approved.

## Desktop Support Specialist - MCSA

Desktop support specialists are qualified to successfully troubleshoot, repair and upgrade the desktop computer including hardware and software in a Windows networked environment. The courses in this certificate help prepare students to take the Microsoft exams to earn a MCSA.

## CERTIFICATE OF PROFICIENCY

Program Requirements	Units	
CSNT 110	Hardware and O.S. Fundamentals	3
CSNT 111	Networking Fundamentals	3
CSNT 120	Windows Client	3
CSNT 121	Windows Server	3
<b>Electives (Select 1 course)</b>		
CSNT 140	Linux Administration	2
CSNT 222	Managing a Windows Infrastructure	2
<b>TOTAL UNITS</b>		<b>14</b>

## Network Engineer - MCSE

Network Engineers are qualified to effectively plan, implement, maintain, troubleshoot and support networks in a wide range of computing environments using Microsoft Windows. The courses in this certificate help students prepare to take the Microsoft exams to earn an MCSE.

### CERTIFICATE OF PROFICIENCY

Program Requirements	Units	
CSNT 121	Windows Server	3
CSNT 221	Windows Infrastructure Administration	3
CSNT 224	Active Directory Services Administration	3
<b>Group One Electives (Select 1 course)</b>		
CSNT 230	Design Windows Active Directory & Infrastructure	2
CSNT 231	Design Windows Network Security	2
<b>Group Two Electives (Select 2 courses)</b>		
CSNT 141	Linux Networking and Security	2
CSNT 222	Managing a Windows Infrastructure	2
CSNT 230	Design Windows Active Directory & Infrastructure	2
CSNT 231	Design Windows Network Security	2
CSNT 235	Microsoft Exchange Server	2
CSDB 210	SQL Server Administration	2
CSDB 220	SQL Server Programming	3
<b>TOTAL UNITS</b>		<b>15 - 16</b>

### COURSE OFFERINGS

<b>CSNT 110</b>	<b>Hardware and O.S. Fundamentals</b>	<b>(3)</b>
(Formerly CSIS 108)		
<i>1 1/2 hours lecture-3 hours lecture/laboratory</i>		
<b>Transfer acceptability:</b> CSU		
Provides the knowledge and skills necessary to build a foundation in computer hardware and operating systems. Includes P.C. hardware and operating system fundamentals; installation, configuration and upgrading; diagnosing and troubleshooting; preventative maintenance; motherboards, processors, and memory; printers; and basic networking including network operating systems.		
<b>CSNT 111</b>	<b>Networking Fundamentals</b>	<b>(3)</b>
(Formerly CSIS 111)		
<i>1 1/2 hours lecture-3 hours lecture/laboratory</i>		
<b>Transfer acceptability:</b> CSU		
Provides the knowledge and skills necessary to build a solid foundation in computer networking. Includes networking fundamentals, the OSI model, subnetting, features and functions of networking components, and the skills needed to install, configure, and troubleshoot basic networking hardware peripherals and protocols.		
<b>CSNT 120</b>	<b>Windows Client</b>	<b>(3)</b>
(Formerly CSIS 162)		
2 hours lecture-2 hours lecture/laboratory		
<b>Note:</b> May be taken 4 times		
<b>Transfer acceptability:</b> CSU		

Provides the knowledge and skills necessary to install and configure Microsoft Windows Client on stand-alone computers and on client computers that are part of a workgroup or a domain.

**CSNT 121 Windows Server (3)**  
(Formerly CSIS 163)

2 hours lecture-2 hours lecture/laboratory

**Prerequisite:** CSNT 120 and Completion of, or concurrent enrollment in CSNT 110 and CSNT 111

**Note:** May be taken 4 times

**Transfer acceptability:** CSU

Provides the knowledge and skills necessary to install, configure, and administer a Microsoft Windows Server in a Network. Typical network services and applications include file and print, database, messaging, proxy server or firewall, dial-in server, desktop management, and Web hosting.

**CSNT 140 Linux Administration (2)**  
(Formerly CSIS 227)

4 hours lecture/laboratory

**Prerequisite:** CSCI 130

**Transfer acceptability:** CSU

A hands on/theory introduction to UNIX System Administration including system start up and shutdown, administration files, system security, backup procedures, and user registration. Course will cover terminal and printer administration.

**CSNT 141 Linux Networking and Security (2)**  
(Formerly CSIS 228)

4 hours lecture/laboratory

**Prerequisite:** CSNT 140

**Transfer acceptability:** CSU

A hands-on/theory introduction to important administration activities required to manage a Linux network configuration. Course will cover topics configuring TCP/IP, DNS, PPP, send mail, Apache Web Server and the firewall.

**CSNT 160 Cisco Networking Fundamentals (3)**  
(Formerly CSIS 130)

1 ½ hours lecture-3 hours lecture/laboratory

**Note:** May be taken 3 times

**Transfer acceptability:** CSU

Emphasis on the OSI model and industry standards. Includes network topologies, IP addressing, subnet masks, basic network design and cable installation. This 70 hour course of instruction prepares the student for Cisco certification examination.

**CSNT 161 Cisco Router Configuration (3)**  
(Formerly CSIS 131)

1 ½ hours lecture-3 hours lecture/laboratory

**Prerequisite:** CSNT 160

**Note:** May be taken 3 times

**Transfer acceptability:** CSU

Development of knowledge and skills to install, configure, customize, maintain and troubleshoot Cisco routers and components. This 70-hour course of instruction prepares the student for Cisco certification examination.

**CSNT 180 Wireless Networking (3)**  
(Formerly CSIS 135)

1 ½ hours lecture-3 hours lecture/laboratory

**Prerequisite:** CSNT 110, and CSNT 111 or CSNT 160

**Transfer acceptability:** CSU

Provides a hands-on guide to planning, designing, installing and configuring wireless LANs that prepares students for the Certified Wireless Network Administrator (CWNA) certification. In-depth coverage of wireless networks with extensive step-by-step coverage of IEEE 802.11 b/a/g/pre-n implementation, design, security, and troubleshooting. Material is reinforced with hands-on projects at the end of each chapter from two of the principal wireless LAN vendors, Cisco and Linksys.

**CSNT 181 Hacker Prevention/Security (3)**  
(Formerly CSIS 136)

1 ½ hours lecture-3 hours lecture/laboratory

**Prerequisite:** CSNT 110, and CSNT 111 or CSNT 160

**Transfer acceptability:** CSU

In-depth analysis and hands-on experience in PC and network security concepts specific to Microsoft, Unix-based and Cisco systems. Various topics including hacker prevention and intrusion detection, firewall installation and configuration, wireless network security, disaster recovery, access control lists, identification of malicious code, cryptography and forensics. Team dynamics in a lab environment, planning, installing, and configuring various network security elements regarding hardware, software, and media. Understand and demonstrate proper planning and implementation of a secure network, document and offer training to end-users, executives, and human resources on the proper maintenance of a secure network.

**CSNT 221 Windows Infrastructure Administration (3)**  
(Formerly CSIS 164)

2 hours lecture-2 hours lecture/laboratory

**Prerequisite:** CSNT 121

**Note:** May be taken 4 times

**Transfer acceptability:** CSU

Provides the knowledge and skills necessary to install, configure, manage, and support a network infrastructure that uses the Microsoft Windows Server products.

**CSNT 222 Managing a Windows Infrastructure (2)**  
(Formerly CSIS 176)

1 ½ hours lecture-1 hour lecture/laboratory

**Prerequisite:** CSNT 221

**Transfer acceptability:** CSU

Provides the knowledge and skills necessary to administer, support, and troubleshoot networks that incorporate Microsoft Windows.

**CSNT 224 Active Directory Services Administration (3)**  
(Formerly CSIS 165)

2 hours lecture-2 hours lecture/laboratory

**Prerequisite:** CSNT 121

**Note:** May be taken 4 times

**Transfer acceptability:** CSU

Provides the knowledge and skills necessary to install, configure, and administer Microsoft Windows Active Directory Services. Also focuses on implementing Group Policy and understanding the Group Policy tasks required to centrally manage users and computers.

**CSNT 230 Design Windows Active Directory & Infrastructure (2)**  
(Formerly CSIS 166/167)

1 ½ hours lecture-1 hour lecture/laboratory

**Prerequisite:** CSNT 221, 222, and 224

**Transfer acceptability:** CSU

Provides the knowledge and skills necessary to design a Microsoft Windows directory services infrastructure in an enterprise network.

**CSNT 231 Design Windows Network Security (2)**  
(Formerly CSIS 168)

1 ½ hours lecture-1 hour lecture/laboratory

**Prerequisite:** CSNT 221, 222, and 224

**Transfer acceptability:** CSU

Provides the knowledge and skills necessary to design a security framework for small, medium, and enterprise networks using Microsoft Windows technologies.

**CSNT 235 Microsoft Exchange Server (2)**  
(Formerly CSIS 177)

1 ½ hours lecture-1 hour lecture/laboratory

**Prerequisite:** CSNT 121, 221, and 224

**Transfer acceptability:** CSU

Provides the knowledge and skills necessary to implement, administer, and troubleshoot information systems that incorporate Microsoft Exchange Server.

**CSNT 260 Cisco Advanced Routing and Switching (3)**

(Formerly CSIS 132)

1½ hours lecture-3 hours lecture/laboratory

**Prerequisite:** CSNT 161**Note:** May be taken 3 times**Transfer acceptability:** CSU

Development of knowledge and skills to configure advanced routing protocols, Local Area Networks (LANs), and LAN switching. Design and management of advanced networks. This 70-hour course of instruction prepares the student for Cisco certification examination.

**CSNT 261 Cisco Wide Area Network Design and Support (3)**

(Formerly CSIS 133)

1½ hours lecture-3 hours lecture/laboratory

**Prerequisite:** CSNT 260**Note:** May be taken 3 times**Transfer acceptability:** CSU

Development of knowledge and skills to design and configure advanced Wide Area Network (WAN) projects using Cisco IOS command set. This 70-hour course of instruction prepares the student for Cisco certification examination.

## Computer Science and Information Systems - Web Technology (CSWB)

See also CSIS - Computer Science, CSIS - Database, CSIS - Information Technology, and CSIS - Networking

Contact the Computer Science and Information Systems Department for further information.

(760) 744-1150, ext. 2387

Office: ST 6

<http://www.palomar.edu/csib>**Certificates of Proficiency -**

Certificate of Proficiency requirements are listed in Section 6 (green pages).

- Web Developer with Emphasis in Java/Open Source
- Web Developer with Emphasis in Windows
- Web Server Administrator with Emphasis in Linux
- Web Server Administrator with Emphasis in Windows

**PROGRAMS OF STUDY**

### Web Developer with Emphasis in Java/Open Source

This program includes the Web page design and programming languages that allow a developer to build dynamic Web applications with emphasis in the Java/Open Source platform.

**CERTIFICATE OF PROFICIENCY**

Program Requirements	Units
CSWB 110/	
R CSIS 110 Web Site Development with XHTML	2
CSWB 120 JavaScript	3
CSWB 150 PHP with MySQL	3
CSWB 170 Java for Information Systems	3
CSWB 220 Advanced JavaScript and XML (AJAX)	3
<b>Electives (Select 1 course)</b>	
CSWB 130 Advanced Web Site Development	3
CSWB 160 Perl and CGI Scripting	3
CSWB 180 Python Programming	3
CSWB 270 Java Servlets and JSPs	3
CSDB 110 Introduction to SQL	3
CSDB 140 Introduction to Oracle	3
GCMW/	
R GCMW 102 Web Page Layout I	3
GCMW 140 Web Graphics	3
<b>TOTAL UNITS</b>	<b>17</b>

### Web Developer with Emphasis in Windows

This program includes the Web page design and programming languages that allow a developer to build dynamic Web applications with emphasis in the Java/Open Source platform.

**CERTIFICATE OF PROFICIENCY**

Program Requirements	Units
CSWB 110/	
R CSIS 110 Web Site Development with XHTML	2
CSWB 120 JavaScript	3
CSWB 130 Advanced Web Site Development	3
CSWB 210 Active Server Pages	3
CSIT 180 C# Programming I	3
<b>Electives (Select 1 course)</b>	
CSWB 170 Java for Information Systems	3
CSWB 270 Java Servlets and JSPs	3
CSDB 220 SQL Server Programming	3
GCMW 102/	
R GCMW 102 Web Page Layout I	3
GCMW 140 Web Graphics	3
<b>TOTAL UNITS</b>	<b>17</b>

### Web Server Administrator with Emphasis in Linux

This program includes the use and implementation of web-networked environments for the purpose of administering Internet/Intranet applications. Strong emphasis is placed on hands-on server administration, networking, supplemented with web development and design.

**CERTIFICATE OF PROFICIENCY**

Program Requirements	Units
CSWB 110/	
R CSIS 110 Web Site Development with XHTML	2
CSWB 160 Perl and CGI Scripting	3
CSCI 130 Linux Fundamentals	2
CSNT 140 Linux Administration	2
CSNT 141 Linux Networking and Security	2
<b>Electives (Select 1 course)</b>	
CSWB 290 Implementing and Administering Web Servers	2.5
CSCI 132 Linux Shell Scripting	2
GCMW 217 Online Store Design I	3
<b>TOTAL UNITS</b>	<b>13 - 14</b>

### Web Server Administrator with Emphasis in Windows

This program includes the use and implementation of web-networked environments for the purpose of administering Internet/Intranet applications. Strong emphasis is placed on hands-on server administration, networking, supplemented with web development and design.

**CERTIFICATE OF PROFICIENCY**

Program Requirements	Units
CSWB 110/	
R CSIS 110 Web Site Development with XHTML	2
CSDB 210 SQL Server Administration	2
CSNT 120 Windows Client	3
CSNT 121 Windows Server	3
<b>Electives (Select 1 course)</b>	
CSWB 290 Implementing and Administering Web Servers	2.5