EL DORADO UNION HIGH SCHOOL DISTRICT
Educational Services

Course of Study Information Page

Course Title: Cisco Networking 1-2 (#490) & Cisco Networking 3-4 (#491)	
Rationale: A continuum of courses, including advanced classes in technology is needed. At Union Mine, the 4 x 4 schedules create an immediate need for additional elective options. This course provides the opportunity for students to increase their technical skills through a year long (one term) course. In addition, this course offers students the opportunity to explore video production as a possible career option.	
Course Description: This course teaches students to design, build, and maintain computer networks. The curriculum covers a broad range of topics: from basic networking skills such as pulling cable to more complex concepts such as applying advanced troubleshooting tools. Students will be eligible to test for Cisco certification, CCNA (Cisco Certified Network Administrator), at the end of semester 4.	
Length of Course:	Year – UMHS Two semesters – EDHS, PHS, ORHS, IHS
Grade Level:	Grades 10-12
Credit: Number of units: 5 units per semester ❑Meets graduation requirements ❒ Request for UC "a-f" requirements ❒ College Prep ❒ Elective ❒ Vocational	
Prerequisites:	Successful completion of Computer Technology 1/2 and Tech Team
Department(s):	Business
District Sites:	EDHS, ORHS, PHS, UMHS, IHS
Board of Trustees Adoption Date:	January 22, 2002
Textbook(s)/Instructional Materials:	
Date Adopted by the Board of Trustees:	

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Semester 1 - Unit 1: Computer Basics

Goal: Students will be introduced to the components of a computer and the role of computers in a networking system.

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the basic computer hardware components • Understand computer software basics • Understand the binary numbering system • Define networks and networking • Define digital bandwidth	Read Chapter 1 “Computer Basics” Complete Labs 1.1.1 - 1.3.6 Complete Chapter 1 – Computer Basics in the Engineering Journal and Workbook Complete “Check for Understanding” Complete the Practice Quiz online Complete Chapter 1 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 1.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 2: The OSI Model

Goal: Students will understand how the OSI Model and standards ensure greater compatibility and interoperability between various types of network technologies.

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe a general model of communication • Describe the OSI reference model • Compare the OSI model and the TCP/IP model	Read Chapter 2 "The OSI Model" Computer Labs 2.2.5 - 2.3.4 Complete Chapter 2 – The OSI Model in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 2 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5, and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 2.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 3: Local-Area Networks

Goal: Students will be introduced to network topologies, basic LAN devices and the evolution of network devices.

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe network topologies • Describe basic LAN devices • Describe the evolution of network devices • Describe the basics of data flow through LANs • Describe how to build a LAN	Read Chapter 3 "Local Area Networks" Complete Lab 3.4.2 Complete Chapter 3 – Local Area Networks in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 3 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5, and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 3.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 4: Layer 1: Electronics and Signals

Goal: Students will be introduced to the basic theory of electricity, which provides a foundation for understanding networking at the physical layer of the OSI Model

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand the basics of electricity • Understand the basics of digital multimeters • Understand the basics of signals and noise in communications systems • Understand the basics of encoding networking signals	Read Chapter 4 "Layer 1: Electronics and Signals" Complete Labs 1.1.1 - 1.3.6 Complete Chapter 4 – Layer 1: Electronics and Signals in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 4 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 4.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 5: Layer 1: Media, Connections and Collisions

Goal: Students will be introduced to the network functions that occur at the physical layer of the OSI Model

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe LAN media • Understand cable specifications and cable termination • Describe how to make and test cable • Describe LAN technologies • Describe Layer 1 components and devices • Describe the basic topologies used in networking	Read Chapter 5 "Layer 1: Media, Connections and Colllisons" Complete Labs 5.3.1 - 5.3.7 Complete Chapter 5 – Layer 1: Media, Connections and Collisions in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 5 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 5.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 6: Layer 2: Concepts

Goal: Students will be introduced to LAN media and the IEEE model and how the data link layer provides reliable transit of data across the physical link by using the Media Access Control (MAC) addresses

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand how LANs operate at the data link layer • Understand hexadecimal numbers • Understand MAC addressing • Describe framing • Describe Media Access Control (MAC) addresses	Read Chapter 6 "Layer 2: Concepts" Complete Chapter 6 – Layer 2: Concepts in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 6 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 6.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 7: Layer 2: Technologies

Goal: Students will be introduced to Ethernet, FDDI and Token Ring, along with the IEEE specifications for each of these technologies

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand Token Ring basics • Understand Fiber Distributed Data Interface (FDDI) basics • Understand Ethernet and IEEE 802.3 • Describe Layer 2 devices • Describe Ethernet LAN segmentation • Understand basic Ethernet 10BaseT troubleshooting	Read Chapter 7 "Layer 2 - Technologies" Complete Labs 7.6.2 - 7.6.4 Complete Chapter 7 – in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 7 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 7.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 8: Design and Documentation

Goal: Students will be introduced to how the network's physical and logical topologies should be designed and documented

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand basic network design and documentation • Describe wiring closet specifications • Identify potential wiring closets • Understand wiring closet selection • Understand horizontal and backbone cabling • Understand electricity and grounding • Describe a wiring plan for an Ethernet star topology LAN • Describe multiple earth ground problems • Describe power line problems • Describe surge suppressors and uninterruptible power supply (UPS) functions	Read Chapter 8 "Design and Documentation" Complete Chapter 8 – Design and Documentation in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 8 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 8.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 9: Structured Cabling Project

Goal: Students will be introduced to the appropriate and recommended techniques for dressing and securing the cable

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand project planning • Describe RJ-45 jack and outlet installation • Understand the basics of cable installation • Describe structured cable run installation • Describe how to string, run, and mount cable • Understand the basics of wiring closets and patch panels • Describe the range of equipment for testing structured cabling projects	Read Chapter 9 “Structured Cabling Projects” Complete Labs 9.2.12 - 9.7.13 Complete Chapter 9 – Structured Cabling Projects in the Engineering Journal and Workbook Complete “Check for Understanding” Complete the Practice Quiz online Complete Chapter 9 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 9.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 10: Layer 3: Routing and Addressing

Goal: Students will be introduced to IP addressing, the three classes of IP networks, subnetworks and subnet masks and their role in IP addressing schemes

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand the importance of the network layer • Describe path determination • Understand Ip addresses • Describe IP address classes • Describe reserved address space • Understand the basics of subnetting • Describe how to create subnets	Read Chapter 10 "Layer 3: Routing and Addressing" Complete Labs 10.4.1 - 10.7.7 Complete Chapter 10 – Layer 3: Routing and Addressing in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 10 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 10.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 11: Layer 3: Protocols

Goal: Students will be introduced to how routers use a Layer 3 addressing scheme and routing tables to make forwarding decisions

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand Layer 3 basics • Describe methods for assigning an IP address • Understand advanced ARP concepts • Explain routed vs. routing protocols • Describe connectionless, non-reliable network services and connection-oriented, reliable network services • Describe ARP tables • Understand Interior Gateway Protocols (IGPs) and Exterior Gateway Protocols (EGPs)	Read Chapter 11 "Layer 3: Protocols" Complete Labs 11.9.1 - 12.4.1 Complete Chapter 11 – Layer 3: Protocols in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 11 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 11.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 12: Layer 4: The Transport Layer

Goal: Students will be introduced to how the transport layer regulates the flow of information from source to destination reliably and accurately

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the transport layer functions • Understand TCP and the TCP/IP protocol stack • Understand Layer 4 protocols • Describe TCP connection methods	Read Chapter 12 “Layer 4: The Transport Layer” Complete Chapter 12 – Layer 4: The Transport Layer in the Engineering Journal and Workbook Complete “Check for Understanding” Complete the Practice Quiz online Complete Chapter 12 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 12.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 13: Layer 5: The Session Layers

Goal: Students will be introduced to how end-to-end connections at the transport layer are turned into sessions by implementing various control mechanisms including accounting, conversion control and session parameter negotiation

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the session layer • Understand dialog control • Understand dialog separation • Identify layer 5 protocols	Read Chapter 13 "Layer 5: The Session Layers" Complete Chapter 13 – Layer 5: The Session Layers in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 13 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 13.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 14: Layer 6: The Presentation Layer

Goal: Students will be introduced to how the presentation layer provides code formatting and conversion, which is used to make sure that applications have meaningful information to process

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the presentation layer functions and standards • Describe file formats handled by the presentation layer • Understand data encryption and compression functions at the presentation layer	Read Chapter 14 "Layer 6: The Presentation Layer" Complete Chapter 14 – Layer 6: The Presentation Layer in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 14 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 14.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 1 - Unit 15: Layer 7: The Application Layer

Goal: Students will be introduced to how the application layer deals with data packets from client/server applications, domain name services, and network applications by examining the following elements: client/server, redirectors, DNS, email, telnet, FTP and HTTP

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand application layer basics • Describe the Domain Name System • Describe network applications • Provide application layer examples	Read Chapter 15 "Layer 7: The Application Layer" Complete Chapter 15 – Layer 7: The Application Layer in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 15 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 15.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 16: WANS and Routers

Goal: Students will be introduced to WAN devices, technologies and standards, as well as the functions of a router in a WAN

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe WAN devices, standards and technologies • Describe the function of a router in a WAN	Read Chapter 16 "WANS and Routers" Complete Chapter 16 – WANS and Routers in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 16 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 16.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 17: Router Command-line Interface (CLI)

Goal: Students will be introduced to the Cisco Internetwork Operating System (IOS) and the Cisco Command-line Interface (CLI)

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe user and privileged modes • Use router help functions • Use IOS editing commands • Use IOS command history	Read Chapter 17 "Router Command-line Interface" Complete Labs 3.2.1 - 3.2.2 Complete Chapter 17 – Router Command-line Interface in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 17 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 17.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 18: Router Components

Goal: Students will be introduced to the correct procedures and commands to access a router, examine and maintain its components, and test its network connectivity

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe external router configuration sources • Describe internal route configuration components • Describe router modes • Use router **show** commands • Describe how to access other routers by using the Cisco Discovery protocol • Use basic network testing commands	Read Chapter 18 "Router Components" Complete Labs 4.4.4 - 4.5.1 Complete Chapter 18 – Router Compnents in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 18 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 18.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 19: Router Startup and Setup

Goal: Students will be introduced to how to start a router for the first time by using the correct commands and startup sequence to do an initial configuration of the router and to create the startup file

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand router boot sequence • Understand setup mode • Use commands related to router startup • Use the **setup** command • Set up global parameters • Set up interface parameters • Set up script review and use	Read Chapter 19 "Router Startup and Setup" Complete Labs 5.2.3 - 5.3.1 Complete Chapter 19 – Router Startup and Setup in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 19 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 19.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 20: Router Configuration 1

Goal: Students will be introduced to how to use router modes and configuration methods to update a router's configuration file using current and older versions of Cisco Internetwork Operating System (IOS) software

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Work with router configuration files • Use various router configuration modes • Use various configuration methods	Read Chapter 20 "Router Configuration 1" Complete Labs 6.1.2 - 6.4.3 Complete Chapter 20 – Router Configuration 1 in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 20 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 20.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 21: IOS Images

Goal: Students will be introduced to a variety of Cisco IOS software source options, execute commands to load Cisco IOS software onto the router, maintain backup files, and upgrade Cisco IOS software

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the process used to locate Cisco Internetwork Operating System (IOS) software • Identify the commands to locate information about Cisco IOS software • Describe bootstrap options in Cisco IOS software • Describe the process and commands for creating and loading a software image backup • Describe Cisco IOS naming conventions	Read Chapter 21 "IOS Images" Complete Labs 7.1.3 - 7.3.5 Complete Chapter 21 – IOS Images in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 21 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 21.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 22: Router Configuration 2

Goal: Students will be introduced to router configuration and practice router configuration

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Configure a router from the CLI after startup config has been erased • Perform password recovery tasks	Read Chapter 22 "Router Configuration 2" Complete Labs 8.1.2 - 8.2.1 Complete Chapter 22 – Router Configuration 2 in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 22 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 22.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 23: TCP/IP

Goal: Students will be introduced to the Cisco Internetwork Operating System (IOS) and the Cisco Command-line Interface (CLI)

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the TCP/IP protocol suite • Describe the TCP/IP Internet layer	Read Chapter 23 "TCP/IP" Complete Labs 9.2.4.1 - X.X.X.X Complete Chapter 23 – TCP/IP in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 23 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 23.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 24: IP Addressing

Goal: Students will review the details of IP address classes, network and node addresses and subnet masking and how to configure an IP address on a router

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe IP addressing and subnetting • Describe IP address configuration • Verify address configuration • Assign new subnet numbers to the topology	Read Chapter 24 "IP Addressing" Complete Labs 10.1.4 - 10.4.1 Complete Chapter 24 – IP Addressing in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 24 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 24.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 25: Routing

Goal: Students will be introduced to the router's use and operations in performing the key internetworking function of the Open System Interconnection (OSI) reference model's network layer, layer 3, review the difference between routing and routed protocols and how routers track distance between locations, and distance-vector, link-state and hybrid routing approaches and how each resolves common routing problems

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Understand routing basics • Describe why routing protocols are necessary • Describe distance-vector routing • Describe link-state routing • Understand how to use different routing protocols in context	Read Chapter 25 "Routing" Complete Chapter 25 – Routing in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 25 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 25.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 26: Routing Protocols

Goal: Students will be introduced to the initial configuration of the router to enable the IP routing protocols of the Routing Information Protocol (RIP) and the Interior Gateway Routing Protocol (IGRP) and how to monitor IP routing protocols.

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe initial router configuration • Describe interior and exterior routing protocols • Describe RIP • Describe IGRP	Read Chapter 26 "Routing Protocols" Complete Labs 12.1.5 - 12.5.3 Complete Chapter 25 – Routing in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 26 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 26.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 27: Network Troubleshooting

Goal: Students will be introduced to troubleshooting using the language of the OSI model to put troubleshooting in perspective as it relates to Semester 2 router labs and use a general problem-solving approach for networking

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the general model for troubleshooting • Describe how to develop a troubleshooting routine	Read Chapter 27 "Network Troubleshooting" Complete Lab 13.1.6 Complete Chapter 27 – Troubleshooting in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 27 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 27.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 28: Introduction to Network Security

Goal: Students will be introduced to why network security is essential, primary threats to network security and the different types of network attacks.

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe why network security is essential • Describe network security as a continuous process	Read Chapter 24 “IP Addressing” Complete Labs 10.1.4 - 10.4.1 Complete Chapter 24 – IP Addressing in the Engineering Journal and Workbook Complete “Check for Understanding” Complete the Practice Quiz online Complete Chapter 24 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 28.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 2 - Unit 29: Network Management

Goal: Students will be introduced to managing a network by using such techniques as documenting, auditing, monitoring, and evaluating

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Identify the functions of various types of audits • Identify the purpose of a network map • Identify network software management tools and their functions • Identify characteristics and functions of SNMP and CMIP • Identify methods needed to troubleshoot a network • Identify the purpose of network performance evaluation	Read Chapter 29 “Network Management” Complete Chapter 29 – Network Management in the Engineering Journal and Workbook Complete “Check for Understanding” Complete the Practice Quiz online Complete Chapter 29 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 29.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

EL DORADO UNION HIGH SCHOOL DISTRICT
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Semester 2 - Unit 30: Introduction to Residential Networking

Goal: Students will be introduced to the emerging home network integration industry and explore the evolution of the subsystems in the home as individual networks into an integrated home network

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe home network integration market drivers • Describe the home network architecture • Describe home network subsystems	Read Chapter 30 "Introduction to Residential Networking" Complete Chapter 30 – Introduction to Residential Networking in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Practice Quiz online Complete Chapter 30 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 30.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 1: Review: The OSI Reference Model and Routing

Goal: Students will review the Open System Interconnection (OSI) reference model and an overview of network planning and design considerations related to routing

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the overall function of the OSI reference model and the problems it solves • Describe the characteristics of the physical layer of the OSI reference model • Describe the characteristics of the data link layer of the OSI reference model • Describe the characteristics of the network layer of the OSI reference model • Describe the characteristics of the transport layer of the OSI reference model • Describe the function of routing in networks • Understand the different classes of routing protocols	Read Chapter 1 "Review: The OSI Reference Model and Routing" Complete Chapter 1 – Review: The OSI Reference Model and Routing in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the chapter's e-lab activities (1.1 - 1.3), view the chapter's movies on the companion CD-ROM (Movie 1.1 - 1.15) Complete the Skill Builders listed in the chapter Complete the Practice Quiz online Complete Chapter 1 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 31.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 2: LAN Switching

Goal: Students will be introduced to problems in a local-area network and possible solutions that can improve LAN performance

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the various LAN communication problems, such as: collisions, CSMA/CD, demands of multimedia applications on the network, normal latency, distance and repeaters and excessive broadcasts • Describe full-duplex transmitting and the Fast Ethernet standard as two methods to improve LAN performance • Describe the effects of LAN segmentation with bridges, routers and switches • Describe switching • Describe the operation and benefits of LAN switching • Describe the Spanning-Tree Protocol • Describe the benefits of VLANs	Read Chapter 2 "LAN Switching" Complete Chapter 2 – LAN Switching in the Engineering Journal and Workbook Complete "Check for Understanding" View the chapter's movies on the companion CD-ROM (Movie 2.1 - 2.11) Complete the Skill Builders listed in the chapter Complete the Practice Quiz online Complete Chapter 2 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 32.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 3: VLANs

Goal: Students will be introduced to VLANs and switched internetworking, the differences between traditional shared LAN configurations with switched LAN configurations and the benefits of using a switched VLAN architecture

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Explain what VLANs are • Name reasons to create VLANs and describe the benefits of VLANs • Describe the role that switches play in the creation of VLANs • Describe VLAN frame filtering, frame identification, and frame tagging • Describe how switches can be used with hubs • Name and describe the three methods of VLAN implementation	Read Chapter 3 "VLANs" Complete Chapter 3 – VLANs in the Engineering Journal and Workbook Complete "Check for Understanding" View the chapter's movies on the companion CD-ROM (Movie 3.1) Complete the Skill Builders listed in the chapter Complete the Practice Quiz online Complete Chapter 3 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 33.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 4: LAN Design

Goal: Students will be introduced to an overview of the LAN design process and students will begin the process of designing a LAN for a sample school district WAN, the Washington School District WAN

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Explain LAN design goals • Identify LAN design issues • Explain network design methodology • Describe how to gather and analyze network equipment • Identify layer 1 (media and topology) design issues • Identify Layer 3 (routing) design issues • Describe the physical and logical network implementation documentation	Read Chapter 4 "LAN Design" Complete Chapter 4 – LAN Design in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 4 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 34.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 5: Routing Protocols: IGRP

Goal: Students will be introduced to how routers can be used to connect two or more networks and how they are used to pass data packets between networks based on network protocol information

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the routing functions of the network layer and how these functions relate to path determination in a router • Describe routed and routing protocols • Describe interior and exterior protocols • Describe routing protocol characteristic and configuration • Describe IGRP features, operation and configuration tasks	Read Chapter 5 "Routing Protocols: IGRP" Complete Chapter 5 – Routing protocols in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the chapter's e-lab activities (5.1 - 5.5) View the chapter's movies on the companion CD-ROM (Movie 5.1 - 5.6) Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 5 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 35.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 6: ACLs

Goal: Students will be introduced to how to use standard and extended ACLs as a means to control network traffic and how ACLs are used as part of a security solution

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Define and describe the purpose and operation of ACLs • Explain the processes in testing packets with ACLs • Describe ACL configuration commands, global statements, and interface commands • Define and explain the function and operation of wildcard masks bits and the wildcards any and host • Describe standard ACLs • Describe extended ACLs • Describe named ACLs • Monitor and verify selected ACL operations on the router	Read Chapter 6 "ACLs" Complete Chapter 6 – ACLs in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the chapter's e-lab activities (6.1 - 6.9) Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 6 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 36.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 7: Novell IPX

Goal: Students will be introduced to Novell's IPX protocols, operation and configuration

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Explain how Cisco routers are used in NetWare networks • Describe the Novell NetWare protocol suite • Describe Novell IPX addressing • Describe Novell encapsulation • Explain how Novell uses RIP for routing • Describe Service Advertising Protocol • Configure both the router Ethernet and serial interfaces with IPX addresses • Describe how to discover IPX addresses on remote routers • Describe how to verify IPX operation and connectivity between routers • Explain troubleshooting in IPX operations	Read Chapter 7 "Novell IPX" Complete Chapter 7 – Novell IPX in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the chapter's e-lab activities (7.1 - 7.11) View the chapter's movies on the companion CD-ROM (Movie 7.1 - 7.4) Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 7 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 37.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 3 - Unit 8: Network Management, Part 1

Goal: Students will be introduced to network management, which involves many different areas, such as: network documentation, network security, network maintenance, server administration and server maintenance

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Network documentation • Network security • Environmental factors • Network performance • Server administration • Network troubleshooting	Read Chapter 8 "Network Management, Part 1" Complete Chapter 8 – Network Management, Part 1, in the Engineering Journal and Workbook Complete "Check for Understanding" Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 8 test online with a passing score of at least 70% Complete Semester 3 Exam with a passing score of at least 80%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 38.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 9: WANs

Goal: Students will be introduced to the various protocols and technologies used in wide-area network (WAN) environments

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the purpose and function of WANs • Describe the various WAN devices • Describe WAN operation • Understand WAN encapsulation formats • Understand WAN link options	Read Chapter 9 "WANs" Complete Chapter 9 – WANs in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 9 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 39.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 10: WAN Design

Goal: Students will be introduced to the various methodologies utilized to design WANs

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe WAN communication • Describe the process and considerations for designing a WAN • Describe the process for gathering user requirements for WAN design • Describe the benefits of using a hierarchical design model, and identify and describe the three layers of the hierarchical model • Describe the placement of ISDN and Frame Relay • Describe how placement of enterprise servers and workgroup servers affect traffic patterns across the WAN • Describe the backbone service requirements • Describe the benefits of switches and layer 2 services • Describe the benefits of routers and layer 3 services • Describe multiple- and single-protocol routing • Identify and describe WAN reliability options	Read Chapter 10 "WAN Design" Complete Chapter 10 – WAN Design in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 10 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 40.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 11: PPP

Goal: Students will be introduced to the basic components, processes and operations that define Point-to-Point protocol (PPP) communication

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Identify and describe the basic components defining PPP communication • Define and describe the use of LCP and NCP frames in PPP • Understand the process for configuring and verifying PPP • Describe and explain PPP authentication • Define and describe the use of CHAP	Read Chapter 11 "PPP" Complete Chapter 11 – PPP in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the chapter's e-lab activities (11.1 - 7.5) View the chapter's movies on the companion CD-ROM (movie 11.1 - 11.6) Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 11 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 41.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 12: ISDN

Goal: Students will be introduced to the services, standards, components, operation and configuration of Integrated Services Digital Network (ISDN) communication

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe ISDN and its components • Describe ISDN standards • Describe ISDN encapsulation • Describe ISDN uses • Describe BRI and PRI • Describe ISDN configuration tasks • Describe dial-on-demand routing	Read Chapter 12 "ISDN" Complete Chapter 12 – ISDN in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the chapter's e-lab activities (12.1 - 12.5) View the chapter's movies on the companion CD-ROM (Movie 12.1) Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 12 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 42.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 13: Frame Relay

Goal: Students will be introduced to Frame Relay, which can be implemented to solve connectivity issues for users who need access to geographically distant locations

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the operation of Frame Relay • Describe the functions of DLCIs in Frame Relay • Describe Cisco's implementation of Frame Relay • Describe the process for configuring and verifying Frame Relay • Describe the Frame Relay subinterfaces • Describe how Frame Relay uses subinterfaces to solve the problem of split horizon	Read Chapter 13 "Frame Relay" Complete Chapter 13 – Frame Relay in the Engineering Journal and Workbook Complete "Check for Understanding" Complete the chapter's e-lab activities (13.1 - 13.9) View the chapter's movies on the companion CD-ROM (Movie 13.1) Complete the Skill Builders listed in the chapter Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 13 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 43.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 14: Network Management, Part II

Goal: Students will expand their knowledge of managing a network using techniques such as documenting, monitoring, and troubleshooting

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe the administrative side of network management • Describe how to monitor a network • Describe how to troubleshoot a network	Read Chapter 14 "Network Management, Part II" Complete Chapter 14 – Network Management, Part II, in the Engineering Journal and Workbook Complete "Check for Understanding" Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 14 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 44.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 15: Network+ Certification Exam Review

Goal: Students will review the topics that they need to know to successfully pass the network+ certification exam

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe basic networking • Describe the physical layer • Describe the data link layer • Describe the network layer • Describe the transport layer • Describe TCP/IP fundamentals • Describe TCP/IP suite utilities • Describe Remote connectivity • Describe proper security procedures • Describe the process for installation of a network • Describe how to maintain and support a network • Describe the process for troubleshooting the network	Read Chapter 15 "Network+ Certification Exam Review" Complete Chapter 15 – Network+ Certification Exam Review in the Engineering Journal and Workbook Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 15 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 45.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Course Title: Cisco Networking 1-4

Semester 4 - Unit 16: CCNA Certification Exam Review

Goal: Students will review and prepare for the CCNA certification exam

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Explain the OSI model • Explain subnet creation • Explain router commands • Complete a skills-based sample scenario	Read Chapter 16 "CCNA Certification Exam Review" Complete Chapter 16 – CCNA Certification Exam Review in the Engineering Journal and Workbook Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 16 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 46.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 17: Remote Access Technologies

Goal: Students will be introduced to an overview of remote access technologies

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Explain wireless remote technologies • Discuss the pros and cons of accessing the internet via cable modems, wireless connections and digital subscriber lines (xDSL)	Read Chapter 17 "Remote Acess Technologies" Complete Chapter 17 – Remote Access Technologies in the Engineering Journal and Workbook Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 17 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 1.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 19: Virtual Private Networks

Goal: Students will be introduced to the characteristics of virtual private networks

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe VPN operation • Describe VPN implementation • Describe Cisco Systems VPNs • Describe tunneling • Describe Cisco's L2F implementation • Describe the end-to-end virtual dial-up process • Describe highlights of the virtual dial-up service	Read Chapter 18 "virtual Private Networks" Complete Chapter 18 – Virtual Private Networks in the Engineering Journal and Workbook Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 18 test online with a passing score of at least 70%

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 2.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications

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Semester 4 - Unit 19: Developing Network Security and Network Management

Goal: Students will be introduced to working with a network design customer to develop effective security strategies, and how to select the right tools and products to implement the strategies

OBJECTIVES The student will:	SUGGESTED ACTIVITIES
• Describe network security design • Describe security mechanisms • Select security solutions	Read Chapter 19 "Developing Network Security and Network Managements Strategies" Complete Chapter 19 – Developing Network Security and Network Managements Strategies Technologies in the Engineering Journal and Workbook Update your Washington School District Project notes Complete the Practice Quiz online Complete Chapter 19 test online with a passing score of at least 70% Pass all of the CCNA certification assessments with a score of 80% or better

Content Area Standards (Please identify the source)
National Technology Standards: 1, 2, 4, 5 and 6
EDCOE Technology Standards and Competencies: Basics and Research
National Business Education Standards: Communication, Computation, and Information Technology
California Business Education Standards: 3.0 Business Core 1.6 Information Technologies 4.0 Computer Science and Information Technology 4.1 Computer Science and Information Technology 4.5 Telecommunications