

BILLINGS PUBLIC SCHOOLS
NETWORKING SYSTEMS
Learner Objectives

MISSION STATEMENT

The Cisco Networking Academy Program is designed to empower students to enter employment or further education and training in the computer networking field while also preparing students for both the Cisco Certified Network Associate Exam and the CompTIA Net+ networking certification exam.

PHILOSOPHY

The students enrolled in this course will experience an e-learning model that integrates the multimedia delivery of a networking curriculum with testing, performance-based skills assessment, evaluation, and reporting through a Web interface. The curriculum goes beyond traditional computer-based instruction by helping students develop practical networking knowledge and skills in a hands-on environment. In a lab setting that closely corresponds to a real networking environment, students learn the principles and practices of networking technology.

LEARNING DOMAINS

- I. Students will be able to set up and maintain Cisco routers as well as program routers using the Command Line Interface to communicate with other equipment in a network. (Semester 2 Cisco)**
- II. Students will be able to set up switches in a network and set up Virtual LANs (VLANs). (Semester 3 Cisco)**
- III. Students will be able to provide security for a network by programming Access Control Lists.**
- IV. Students will be able to use various software (network inspector, configmaker, etc.) and hardware (Fluke one-touch) to troubleshoot and repair networks.**
- V. Students will use the OSI model and subnetting techniques to diagram, design, set up, and troubleshoot existing and new networks. (Case Study, Semesters 3 & 4 Cisco)**
- VI. Students will understand and be able to set up point-to-point protocol, ISDN, and frame relay Wide Area Network (WAN) technologies.**
- VII. Students will be able to design, setup, and maintain efficient, stable, and secure small to medium networks.**

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Chapter 16

WANs and Routers

- Describe WAN devices, standards, and technologies
- Describe the function of a router in a WAN

Chapter 17

Router CLI

- Describe user and privileged modes
- Use router help functions
- Use IOS editing commands
- Use IOS command history

Chapter 18

Router Components

- Describe external router configuration sources
- Describe internal router configuration components
- Describe router modes
- Use router **show** commands
- Describe how to access other routers by using the Cisco Discover Protocol
- Use basic network testing commands

Chapter 19

Router Startup and Setup

- Understand router boot sequence
- Understand setup mode
- Use commands related to router startup
- Use the setup command
- Set up global parameters
- Set up script review and use

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Chapter 20

Router configuration 1

- Work with router configuration files
- Use various router configuration modes
- Use various configuration methods

Chapter 21

IOS Images

- 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

Chapter 22

Router Configuration 2

- Configure a router from the CLI after startup config has been erased
- Perform password recovery tasks

Chapter 23

TCP/IP

- Describe the TCP/IP protocol suite
- Describe the TCP/IP Internet layer

Chapter 24

IP Addressing

- Describe IP addressing and subnetting
- Describe IP address configuration
- Verify address configuration
- Assign new subnet numbers to the topology

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Chapter 25

Routing

- 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

Chapter 26

Routing Protocols

- Describe initial router configuration
- Describe interior and exterior routing protocols
- Describe RIP
- Describe IGRP

Chapter 27

Network Troubleshooting

- Describe a general model for troubleshooting
- Describe how to develop a troubleshooting routine

Chapter 28

Introduction to Network Security

- Describe why network security is essential
- Describe network security as a continuous process

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Chapter 29

Net work Management

- 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