Cisco Networking Academies Curriculum for Semester I through IV

Cisco Systems

Cisco Networking Academies **Curriculum for Semesters I through IV**

The Cisco Networking Academies program consists of four semesters. The program is designed to teach students The skills needed to design, build, and maintain small to medium-size networks. This provides them with the opportunity to enter the workforce and/or further their education and training in the computer networking field.

Below are the objectives of each of the semesters.

Semester	Objectives
Semester 1	Identify and describe the functions of each of the seven layers of the OSI reference model. Describe data link and network addresses and identify key differences between them. Define and describe the function of a MAC address. List the key internetworking functions of the OSI Network layer. Identify at least three reasons why the industry uses a layered model. Describe the two parts of network addressing, then identify the parts in specific protocol address examples. Identify the functions of each layer of the ISO/OSI reference model. Define and explain the five conversion steps of data encapsulation. Describe the different classes of IP addresses [and subnetting]. Identify the functions of the TCP/IP network-layer protocols.
Semester 2	Examine router elements (RAM, ROM, CDP, show). Describe connection-oriented network service and connectionless network service, and identify their key differences. Define flow control and describe the three basic methods used in networking. Identify the functions of the TCP/IP transport-layer protocols. Manage configuration files from the privileged exec mode. Identify the functions performed by ICMP. Control router passwords, identification, and banner. Identify the main Cisco IOS™ software commands for router startup. Check an initial configuration using the setup command. Log in to a router in both user and privileged modes. Use the context-sensitive help facility. Use the command history and editing features. List the commands to load Cisco IOS software from: flash memory, a TFTP server, or ROM. Prepare to backup, upgrade, and load a backup Cisco IOS software image. Identify the parts in specific protocol address examples. List problems that each routing type encounters when dealing with topology changes, and describe techniques to reduce the number of these problems. Configure IP addresses. Verify IP addresses. Prepare the initial configuration of your router and enable IP. Add the RIP routing protocol to your configuration. Add the IGRP routing protocol to your configuration. Configure standard access lists to figure IP traffic. Monitor and verify selected access list operations on the router. Configure extended access lists to filter IP traffic. Monitor and verify selected access list operations on the router.

Semester	Objectives
Semester 3	List the required IPX™ address and encapsulation type. Configure IPX access lists and SAP filters to control basic Novell traffic. Enable the Novell IPX protocol and configure interfaces. Monitor Novell IPX operation on the router. Describe the advantages of LAN segmentation. Describe LAN segmentation using bridges. Describe LAN segmentation using routers. Describe LAN segmentation using switches. Name and describe two switching methods. Describe full- and half-duplex Ethernet operation. Describe network congestion problem in Ethernet networks. Describe the benefits of network segmentation with bridges. Describe the benefits of network segmentation with routers. Describe the benefits of network segmentation with switches. Describe the features and benefits of Fast Ethernet. Describe the guidelines and distance limitations of Fast Ethernet. Distinguish between cut-through and store-and-forward LAN switching. Describe the operation of the Spanning Tree Protocol and its benefits. Describe the benefits of virtual LANs.
Semester 4	Differentiate between the following WAN services: LAPB, Frame Relay, ISDN/LAPD, HDLC, PPP, and DDR. Recognize key Frame Relay terms and features. List commands to configure Frame Relay LMIs, maps, and subinterfaces. List commands to monitor Frame Relay operation in the router. Identify PPP operations to encapsulate WAN data on Cisco routers. State a relevant use and context for ISDN networking. Identify ISDN protocols, function groups, reference points, and channels. Describe Cisco's implementation of ISDN BRI.

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