

Inver Hills Community College

ITC 2611: Cisco Enterprise Network Core Technologies (CCNP 1)

A. COURSE DESCRIPTION

Credits: 3

Lecture Hours/Week: 2

Lab Hours/Week: 2

OJT Hours/Week: *.*

Prerequisites:

This course requires either of these prerequisites

ITC 2530 - Enterprise Networking, Security, and Automation (Minimum grade: 2.0 GPA Equivalent)

ITC 2535 - Scaling and Connecting Networks (CCNA 3/4)

Corequisites: None

MnTC Goals: None

Explores the core technologies of an enterprise network. Focuses on implementing core enterprise network technologies including dual stack (IPv4 and IPv6) architecture, virtualization, layer 2, 3, and wireless infrastructure, network assurance, security and automation. This is the first of two courses preparing students for the Cisco Certified Network Professional Enterprise certification.

B. COURSE EFFECTIVE DATES: 07/31/2020 - Present

C. OUTLINE OF MAJOR CONTENT AREAS

1. Enterprise Network Architecture 15%
Enterprise Network Virtualization and Assurance 20%
Enterprise Network Infrastructure (Layer 2, Layer 3, Wireless, IP Services) 30%
Enterprise Network Security 20%
Enterprise Network Automation 15%

D. LEARNING OUTCOMES (General)

1. The student will be able to:
 - Explain the different design principles used in an enterprise network
 - Analyze design principles of a WLAN deployment
 - Differentiate between on-premises and cloud infrastructure deployments
 - Explain the working principles of the Cisco SD-WAN solution
 - Explain the working principles of the Cisco SD-Access solution
 - Describe concepts of wired and wireless QoS
 - Differentiate hardware and software switching mechanisms
 - Describe device virtualization technologies
 - Configure and verify data path virtualization technologies
 - Describe network virtualization concepts
2.
 - Troubleshoot static and dynamic 802.1q trunking protocols
 - Troubleshoot static and dynamic EtherChannels
 - Configure and verify common Spanning Tree Protocols (RSTP and MST)
 - Compare routing concepts of EIGRP and OSPF (advanced distance vector vs. linked state, load balancing, path selection, path operations, metrics)
 - Configure and verify simple OSPF environments, including multiple normal areas, summarization, and filtering (neighbor adjacency, point-to-point and broadcast network types, and passive interface)
3.
 - Configure and verify eBGP between directly connected neighbors (best path selection algorithm and neighbor relationships)
 - Describe Layer 1 wireless concepts, such as RF power, RSSI, SNR, interference noise, band and channels, and wireless client devices capabilities
 - Describe AP modes and antenna types
 - Describe access point discovery and join process (discovery algorithms, WLC selection process)
 - Describe the main principles and use cases for Layer 2 and Layer 3 roaming
4.
 - Troubleshoot WLAN configuration and wireless client connectivity issues
 - Describe Network Time Protocol (NTP)
 - Configure and verify NAT/PAT
 - Configure first hop redundancy protocols, such as HSRP and VRRP
 - Describe multicast protocols, such as PIM and IGMP v2/v3
 - Diagnose network problems using tools such as debugs, conditional debugs, trace route, ping, SNMP, and syslog
 - Configure and verify device monitoring using syslog for remote logging
5.
 - Configure and verify NetFlow and Flexible NetFlow
 - Configure and verify SPAN/RSPAN/ERSPAN
 - Configure and verify IPSLA
 - Describe Cisco DNA Center workflows to apply network configuration, monitoring, and management
 - Configure and verify NETCONF and RESTCONF
 - Configure and verify device access control
 - Configure and verify infrastructure security features
 - Describe REST API security
6.
 - Configure and verify wireless security features
 - Describe the components of network security design
 - Interpret basic Python components and scripts
 - Construct valid JSON encoded file
 - Describe the high-level principles and benefits of a data modeling language, such as YANG
 - Describe APIs for Cisco DNA Center and vManage
 - Interpret REST API response codes and results in payload using Cisco DNA Center and RESTCONF
 - Construct EEM applet to automate configuration, troubleshooting, or data collection
 - Compare agent vs. agentless orchestration tools, such as Chef, Puppet, Ansible, and SaltStack

E. Minnesota Transfer Curriculum Goal Area(s) and Competencies

None

F. LEARNER OUTCOMES ASSESSMENT

As noted on course syllabus

G. SPECIAL INFORMATION

None noted