IT C128: COMPUTER NETWORKING PRINCIPLES (NETWORK+)

Item	Value
Curriculum Committee Approval Date	10/27/2023
Top Code	070810 - Computer Networking
Units	3 Total Units
Hours	72 Total Hours (Lecture Hours 54; Lab Hours 18)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

Formerly: CST C128. This course introduces the architecture, structure, functions, components, and models of the Internet and other computer networks. The principles and structure of IP (Internet Protocol) addressing and the fundamentals of Ethernet concepts, media, and operations are surveyed to provide a foundation for further study of computer networks. This course uses the OSI (Open Systems Interconnection) and TCP (Transmission Control Protocol) layered models to examine the nature and roles of protocols and services at the application, network, data link, and physical layers. Hands-on exercises help students develop skills to prepare for careers such as Network Engineer or Network Administrator. Helps students gain knowledge in preparation for the CompTIA Network+ certification exam. ADVISORY: IT C104. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Describe and differentiate the devices and services used to support communications in data networks and the Internet.
2. Design, calculate, and apply subnet masks and addresses to fulfill given requirements using alphanumeric addressing methods.
3. Describe the role of protocol layers in data networks.

Course Objectives

• 1. Explain basic computer networking concepts.
• 2. Describe the Open Systems Interconnection (OSI) model and the protocols used at each layer.
• 3. Develop computer networking policies and procedures.

Lecture Content

Networking Concepts Ports and protocols OSI layers Routing and switching IP addressing components Network topologies, types, and technologies Wireless technologies and configurations Cloud concepts and their purpose Network services Infrastructure Cabling solutions Placement of networking devices Use cases for advanced networking devices Virtualization and network storage technologies WAN technologies Network Operations Documentation and diagrams to manage the network Business continuity and disaster recovery concepts Scanning, monitoring, and patching processes Remote access methods Policies and best practices Network Security Physical security devices Authentication and access controls Basic wireless network security Common networking attacks Network device hardening Mitigation techniques Network Troubleshooting and Tools Network troubleshooting methodology Hardware and software troubleshooting tools Troubleshooting wired connectivity and performance issues Troubleshooting common wireless connectivity and performance issues Troubleshooting common network service issues

Lab Content

Identify layers of the Open Systems Interconnection (OSI) model. Perform network management tasks. Configure the appropriate IP addressing components. Implement the appropriate wireless technologies and configurations. Use remote access methods. Implement network device hardening. Troubleshoot common network service issues. Capture and analyze a UDP diagram.

Method(s) of Instruction

• Lecture (02)
• DE Live Online Lecture (02S)
• DE Online Lecture (02X)
• Lab (04)
• DE Live Online Lab (04S)
• DE Online Lab (04X)

Instructional Techniques

This course will utilize a combination of lecture, remote virtual machine assignments, classroom/discussion student interactions, problem-solving, quizzes, tests, and troubleshooting assignments to achieve the goals and objectives of this course. All instructional methods are consistent across all modalities.

Reading Assignments

A. Read and research the configuration and management of common network devices. B. Read how to properly maintain network documentation. C. Read computer networking best practices.

Writing Assignments

A. Complete documentation of purpose and use of proxy servers.B. Compare and contrast business continuity and disaster recovery concepts.C. Identify policies and best practices for computer networking.

Out-of-class Assignments

A. Complete hands-on lab to setup and configure a network.B. Complete hands-on lab to setup peripheral devices on a laptop or personal computer.C. Research based on a given scenario to find a solution using the troubleshooting methodology.

Demonstration of Critical Thinking

Troubleshoot connectivity issues using appropriate hardware and software tools.

Required Writing, Problem Solving, Skills Demonstration

Mathematical Problem-Solving Exercises - Simple TCP/IP subnet addressesNon-Mathematical Problem-Solving Exercises - Scenario based

problem-solving exercises.Skills Demonstration - Using simulations in a remote lab environment.

Eligible Disciplines

Computer service technology: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience. Computer service technology: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience. Computer service technology: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Textbooks Resources

1. Required West, J.; Andrews, J.; Dean, T. Network+ Guide to Networks, 9th ed. Boston, MA: Cengage Learning, 2021 Rationale: -

Other Resources

1. Coastline Library 2. IT white papers are available at no charge to all IT students through the Microsoft IT Academy website.