MIS 251: Networking Fundamentals

(Fall 2020, CRN: 10762, Section: 01W)

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Course Overview

Introduction to voice and data networking concepts and technologies, including network types, common network standards, network interface cards, wired and wireless network components, IP addressing and subnetting, network protocols, basic network security, and troubleshooting basic network issues.

Prerequisites

- MIS 145 – Introduction to PC Hardware/Software (C or better)

Textbook(s) / Learning Resources(s)

(1.) **(REQUIRED)** CompTIA Network+ Certification All-in-One Exam Guide, Seventh Edition
Author: Mike Meyers
Published: June 26, 2018
ISBN-10: 1-2601-2238-7
ISBN-13: 978-1-2601-2238-1

(2.) **(OPTIONAL)** Networking for Systems Administrators
Author: Michael W. Lucas
Published: 2014
ISBN-10: 0-6923-7694-1
ISBN-13: 978-0-6923-7694-2
Tilted Windmill Press: https://www.tiltedwindmillpress.com

Grades

Your course grade will be calculated based on the scores in each of these weighted categories:

Activity	
Discussions	10%
Quizzes	20%
Assignments & Labs	50%
Final Exam	20%

Letter grades will be assigned based on the following scale:
90%-100% = A, 80%-89% = B, 70%-79% = C, 60%-69% = D, <60% = F

Due Dates

All assignment and quiz due dates are posted on Canvas. Ample time is given for each assignment. Assignments are typically due seven calendar days after they are originally assigned.

Late Policy

Assignments need to be completed in a timely manner, turned in via Canvas prior to their respective due date. Without prior instructor approval, I will accept late homework the following week for 80% credit. Any work submitted 7+ days past the original due is gradable at my discretion.

Learning Outcomes

After successful completion of this course you should be able to:

Cables and Connectors

Identify network cables by sight or name (twisted pair, coaxial, straight-through, crossover, console). Identify network cable speed capabilities by name (10BaseT, 100BaseT, 1000BaseT, 10GBaseT). Identify network connectors by sight or name (RJ11, RJ45, F-type, serial). Given a scenario and networking requirements, select and install cables for communication between computers and networking devices. Troubleshoot issues with networking media.

Networking Devices

Identify network interface cards and motherboard expansion slots by name or sight. Given a scenario where a new networking card is required in a new or existing computer, select and install the appropriate networking card. Identify networking and internetworking devices by name or sight (adapters, hubs, bridges, routers, switches). Given a scenario with one or more wired networks, select and install the appropriate networking or internetworking device(s). Given a scenario where a VoIP implementation exists, select and install the appropriate networking devices and cables.

Ethernet

Given a scenario with specific Ethernet specifications, select and install appropriate network devices. Given a scenario with network devices that need to be connected, select the appropriate Ethernet cable(s). Given a scenario where network devices cannot communicate, troubleshoot and resolve physical connectivity.

IP Configuration

Identify and select valid IP addresses and subnet masks for network connections. Given a Windows system, configure static IPv4 or IPv6 address information on a network connection. Given a Windows system, configure the network connection to communicate outside of the local network. Given a Windows system, configure the network connection to use DHCP for IP configuration. Given a Windows server, authorize, configure, and activate DHCP services for a network subnet. Given a Windows system, configure the network connection to query DNS servers. Given a Windows system, configure an alternate IP configuration on a network connection. Given a scenario where Windows systems cannot connect to the network or the Internet, troubleshoot and resolve IP configuration and communication issues. Given a scenario where a Windows system cannot communicate with network hosts by name, troubleshoot and resolve name resolution issues.

Wireless Networking

Given a scenario where computers must communicate within a home wireless network, select and install the appropriate networking devices. Given a wireless access point for a home network, perform configuration tasks to customize settings and enable security. Given a Windows system, configure a wireless network connection to use the same encryption standard and authentication as configured on a wireless access point. Given a Windows system, configure a wireless profile to automatically connect to a wireless network. Given a scenario and a Windows system, prioritize wireless profiles to meet end user requirements. Implement and secure an enterprise wireless network. Given a scenario, troubleshoot and resolve wireless network problems.

Network Security

Given a scenario and a Windows system, configure a basic host firewall. Given a scenario, respond to social engineering exploits. Given a scenario and security requirements, configure a server and remote devices to create and use a VPN connection.

Network Management

Given a scenario, perform data and server backup tasks. Given a Windows system, enable and configure Remote Desktop to meet end user requirements.

Course Outline

Module	Topic	Activities & Assignments
1	Introduction: OSI & TCP/IP Models, Network Topologies	• Read: Chapter 1 • Discussion: Introduction • Quiz 01
2	Infrastructure: cabling, copper/fiber, connector types, standards, Ethernet	• Read: Chapters 2 & 3 • Learning Cisco Packet Tracer • Quiz 02
3	Routing & Switching	• Read: Chapter 5 • Discussion: Managed Network Devices • Getting Started with Cisco IOS
4	Protocols & Ports	• Read: Chapter 6 • Examining Packet with Wireshark • Quiz 03
5	IP Addressing & Subnetting	• Read: Chapter 6 • Discussion: Implementation of IPv6 • Addressing Assignment • Quiz 04
6	Wireless Technologies	• Read: Chapter 4 • Discussion: WiFi 6 & WPA3 • Troubleshooting Wireless • Quiz 05
7	Network Services & WAN Technologies	• Read: Chapter 10 • Discussion: DNS Vulnerabilities • Configuring Network Services • Quiz 06
8	Hardware, Software, and CLI Tools	• Read: Chapter 11 • Networking Commands • Quiz 07
9	Advanced network devices, placement of devices, Network Security	• Read: Chapter 12 • Network Diagram Assignment • Quiz 08
10	Cloud Computing & Virtualization	• Discussion: Networking in Cloud Computing • Troubleshooting with Wireshark
11	Review & Final Exam	• Final Exam

General Course Policy Statements

Changes to Syllabus and Course Schedule

This syllabus serves as a general set of guidelines for the delivery of this course. The instructor reserves the right to adjust course topics, scheduled activities and assignments as needed to best facilitate the course objectives.

Incomplete Grades

In order to be eligible for an “Incomplete” grade, Oregon Tech policy requires that students must have completed 80% of all course work by the time grades are due at the end of finals week. An Incomplete is not automatic and are arraigned at the discretion of the instructor. If you have a personal matter preventing you from completing the course and have successfully completed most of the course work, please contact me as soon as possible.