

COMP 204 Study Guide for FUPE

Format

The exam consists of 8 pages of short answer, essay, and problems for 150 points. Passing is 80%. It is two hours in length and is closed book, and notes. You may bring a calculator for binary/decimal conversions, however. For those students where English is a second language, a translation dictionary may be used.

Notes

This is a difficult exam. You will be expected to do problems related to super and subnet masking, switching, and routing. You should be able to define common terms related to TCP/IP over Ethernet as well as the OSI model. Segmentation, fragmentation, framing, windowing, handshaking, signaling, encoding, collisions, topologies, bandwidth, throughput, and many other topics are all fair game.

Recommended textbook

Dye, M., McDonald, R., & Rufi, A. (2007). Network fundamentals, CCNA exploration companion guide. (2nd ed.). Indianapolis, IN: Cisco Press. ISBN: 9781587132087.

Course Description

Part of the computing infrastructures sequence, this course serves as an introduction to the function, design, administration, and programming of computer networks. Topics include network infrastructure, architecture, protocols, applications, and the OSI networking model.

Course Outcomes

1. Diagram an end-to-end network communication path, describing each intermediate step.
2. Design a small-scale network configuration, including addressing, routing, and switching.
3. Describe the functions of the TCP/IP and Ethernet protocols including select fields, flags, options, headers, and trailers for both.
4. Distinguish between types of data elements (segments, packets, frames, and bits).
5. Map the key elements of the TCP/IP protocol suite to the OSI model.

Weekly Outcomes

Week 1

1. Identify the key components of a data network.
2. Describe the characteristics of network architectures.
3. Assess the value of a layered approach to networking.
4. Compare the layers of the OSI and TCP/IP network models.

Week 2

1. Explain the functions of common TCP/IP application layer programs.
2. Explain how protocols ensure a common language among communications endpoints.
3. Compare and contrast TCP and UDP transport layer protocols.
4. Simulate the key TCP functions of initiation, termination, acknowledgement, and re-transmission.

Week 3

1. Describe IPv4 in terms of addressing, encapsulation, and routing.
2. Describe the interrelationship between IP and both TCP and UDP.
3. Simulate routing between two hosts on diverse networks.

Week 4

1. Convert binary to decimal and decimal to binary to understand subnet masking.
2. Apply bitwise operations to construct sub- and super-nets.
3. Specify a strategy to dividing large networks into smaller versions (CIDR).
4. Distinguish between public, private, and multicast address spaces (RFC1918).

Week 5

1. List and describe several common logical network topologies.
2. Contrast contention strategies in shared media access.
3. Describe methods of encoding bits for physical media.
4. Describe characteristics of common physical media.

Week 6

1. Categorize Ethernet functionality in layers 1 and 2 of the OSI model.
2. Describe the purpose and operation of ARP.
3. Simulate collision resolution on Ethernet.
4. List cabling types, standards, and ports for common physical connections.