
Course Prefix/Number: IST 201
Course Title: Cisco Internetworking Concepts
Lecture Hours/Week: 3.0
Lab Hours/Week: 0.0
Credit Hours/Semester: 3.0

[Distance Learning Attendance/VA Statement](#)
[Textbook Information](#)

COURSE DESCRIPTIONS

This course is a study of current and emerging computer networking technology. Topics covered include safety, networking, network terminology and protocols, network standards, LANs, WANs, OSI models, cabling, cabling tools, Cisco routers, router programming, star topology, IP addressing, and network standards.

COURSE COMPETENCIES

Upon successful completion of this course, the student should be competent to complete the following tasks:

Module 1 – Living in a Network-Centric World

- Describe how networks impact our daily lives.
- Describe the role of data networking in the human network.
- Identify the key components of any data network.
- Identify the opportunities and challenges posed by converged networks.
- Describe the characteristics of network architectures: fault tolerance, scalability, quality of service and security.

Module 2 – Communicating over the Network

- Describe the structure of a network, including the devices and media that are necessary for successful communications.
- Explain the function of protocols in network communications.
- Explain the advantages of using a layered model to describe network functionality.
- Describe the role of each layer in two recognized network models: The TCP/IP model and the OSI model.
- Describe the importance of addressing and naming schemes in network communications.

Module 3 – Application Layer Functionality and Protocols

- Describe how the functions of the three upper OSI model layers provide network services to end user applications.
- Describe how the TCP/IP Application Layer protocols provide the services specified by the upper layers of the OSI model.
- Define how people use the Application Layer to communicate across the information network.
- Describe the function of well-known TCP/IP applications, such as the World Wide Web and email, and their related services (HTTP, DNS, SMB, DHCP, SMTP/POP, and Telnet).
- Describe file-sharing processes that use peer-to-peer applications and the Gnutella protocol.
- Explain how protocols ensure services running on one kind of device can send to and receive data from many different network devices.
- Use network analysis tools to examine and explain how common user applications work.

Module 4 – OSI Transport Layer

- Explain the need for the Transport layer.
- Identify the role of the Transport layer as it provides the end-to-end transfer of data between applications.
- Describe the role of two TCP/IP Transport layer protocols: TCP and UDP.
- Explain the key functions of the Transport layer, including reliability, port addressing, and segmentation.
- Explain how TCP and UDP each handle key functions.
- Identify when it is appropriate to use TCP or UDP and provide examples of applications that use each protocol.

Module 5 – OSI Network Layer

- Identify the role of the Network layer as it describes communication from one end device to another end device.
- Examine the most common Network layer protocol, Internet Protocol (IP), and its features for providing connectionless and best-effort service.
- Group devices into networks based on geography, purpose, and ownership.
- Examine hierarchical addressing of devices and how this allows communication between networks.
- Explain the fundamentals of routes, next-hop addresses, and packet forwarding to a destination network.

Module 6 – Addressing the Network – IPv4

- Explain the structure IP addressing and demonstrate the ability to convert between 8-bit binary and decimal numbers.
- Given an IPv4 address, classify by type and describe how it is used in the network.
- Explain how addresses are assigned to networks by ISPs and within networks by administrators.
- Determine the network portion of the host address and explain the role of the subnet mask in dividing networks.
- Given IPv4 addressing information and design criteria, calculate the appropriate addressing components.
- Use common testing utilities to verify and test network connectivity and operational status of the IP protocol stack on a host.

Module 7 – Data Link Layer

- Explain the role of Data Link layer protocols in data transmission.
- Describe how the Data Link layer prepares data for transmission on network media.
- Describe the different types of media access control methods.
- Identify several common logical network topologies and describe how the logical topology determines the media access control method for that network.
- Explain the purpose of encapsulating packets into frames to facilitate media access.
- Describe the Layer 2 frame structure and identify generic fields.
- Explain the role of key frame header and trailer fields, including addressing, QoS, type of protocol, and Frame Check Sequence.

Module 8 – OSI Physical Layer

- Explain the role of Physical layer protocols and services in supporting communication across data networks.
- Describe the purpose of Physical layer signaling and encoding as they are used in networks.
- Describe the role of signals used to represent bits as a frame is transported across the local media.
- Identify the basic characteristics of copper, fiber, and wireless network media.
- Describe common uses of copper, fiber, and wireless network media.

Module 9 – Ethernet

- Describe the evolution of Ethernet.
- Explain the fields of the Ethernet Frame.
- Describe the function and characteristics of the media access control method used by Ethernet protocol.
- Describe the Physical and Data Link layer features of Ethernet.
- Compare and contrast Ethernet hubs and switches.
- Explain the Address Resolution Protocol (ARP).

Module 10 – Planning and Cabling Networks

- Identify the basic network media required to make a LAN connection.
- Identify the types of connections for intermediate and end device connections in a LAN.
- Identify the pinout configurations for straight-through and crossover cables.
- Identify the different cabling types, standards, and ports used for WAN connections.
- Define the role of device management connections when using Cisco equipment.
- Design an addressing scheme for an internetwork and assign ranges for hosts, network devices, and the router interface.
- Compare and contrast the importance of network designs.

Module 11 – Configuring and Testing your Network

- Define the role of the Internetwork Operating System (IOS).
- Define the purpose of a configuration file.
- Identify several classes of devices that have the IOS embedded.
- Identify the factors contributing to the set of IOS commands available to a device.
- Identify the IOS modes of operation.
- Identify the basic IOS commands.
- Compare and contrast the basic show commands.

MINIMAL STANDARDS

Minimal standards of performance on all course competencies for receiving credit for the course and indicated by 60% overall accuracy on evaluation instruments that address the course competencies listed above. Required standards of performance on all course competencies for enrollment in subsequent higher-level computer technology courses are indicated by 70% overall accuracy on evaluation instruments that address the course competencies listed above.

COURSE REQUIREMENTS

Students are responsible for attending all schedule class meetings until they have completed all course requirements. Students are responsible for all material covered and for all assignments made in all classes. Any student caught cheating or involved in other academic dishonesty will be given a grade of zero and will be subject to further disciplinary action.

ATTENDANCE POLICY

The attendance policy as stated in the York Technical College Handbook will be enforced. Makeup tests will not be given for theory tests. If a student must miss a theory test, he/she will get a zero for that test. However, students have the option of taking the comprehensive final. The student's grade on the comprehensive final will replace his/her lowest theory test grade. It is the student's responsibility to schedule a time for a make-up hands-on test with his/her instructor.

EVALUATION STRATEGIES/GRADING

Students must pass the skills-based test that will be given at the end of the semester. They must also score 70% on the final exam in order to earn credit for the course. If these two criteria are met, the course grade will be comprised of the following:

Module 1 (8% total) Test – 4% of final average Lab(s) – 4% of final average	Module 2 (8% total) Test – 4% of final average Lab(s) – 4% of final average	Grading Scale	
		90-100	A
Module 3 (8% total) Test – 4% of final average Lab(s) – 4% of final average	Module 4 (8% total) Test – 4% of final average Lab(s) – 4% of final average	89-89	B
		70-79	C
Module 5 (8% total) Test – 4% of final average Lab(s) – 4% of final average	Module 6 (8% total) Test – 4% of final average Lab(s) – 4% of final average	60-69	D
		Below 60	F
Module 7 (8% total) Test – 4% of final average Lab(s) – 4% of final average	Module 8 (8% total) Test – 4% of final average Lab(s) – 4% of final average		
Module 9 (8% total) Test – 4% of final average Lab(s) – 4% of final average	Module 10 (8% total) Test – 4% of final average Lab(s) – 4% of final average		
Module 11 (8% total) Test – 4% of final average Lab(s) – 4% of final average	Final Exam (12% total)		

ENTRY LEVEL SKILLS

The student must possess basic computer skills in a Windows operating system environment.

PREREQUISITES

ENG 031 or equivalent, MAT 032 or equivalent, and RDG 031 with minimum grades of SC or equivalent

CO-REQUISITES

None

Disabilities Statement

Any student who feels s/he may need an accommodation based on the impact of a disability should contact the Special Resources Office (SRO) at 803-327-8007 in the 300 area of Student Services. The SRO coordinates reasonable accommodations for students with documented disabilities.