

CCNA 1: Introduction to Networks (ITCC 1314)

Credit: 3 semester credit hours (2 hours lecture, 4 hours lab)



Prerequisite/Co-requisite: None **Course Description**

This course covers networking architecture, structure, and functions; introduces the principles and structure of IP addressing and the fundamentals of Ethernet concepts, media, and operations to provide a foundation for the curriculum.

Required Textbook and Materials

1. *Introduction to Networks Companion Guide (CCNAv7)*, by Cisco Networking Academy, Cisco Press, 2020.
 - a. ISBN number for print book is 978-0-13663-366-2
 - b. ISBN number for print book is 978-0-13663-354-9

Course Objectives

Upon completion of this course, the student will be able to:

1. Build simple LANs.
2. Perform basic configuration on routers and switches.
3. Implement IP addressing schemes.

Course Outline

1. Networking Today
 - a. Networks Affect our Lives
 - b. Network Components
 - c. Network Representations and Topologies
 - d. Common Types of Networks
 - e. Internet Connections
 - f. Reliable Networks
 - g. Network Trends
 - h. Network Security
 - i. The IT Professional

2. Basic Switch and End Device Configuration
 - a. Cisco IOS Access
 - b. IOS Navigation
 - c. The Command Structure
 - d. Basic Device Configuration
 - e. Save Configurations
 - f. Ports and Addresses
 - g. Configure IP Addressing
 - h. Verify Connectivity

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3. Protocols and Models
 - a. The Rules
 - b. Protocols
 - c. Protocol Suites
 - d. Standard Organizations
 - e. Reference Models
 - f. Data Encapsulation
 - g. Data Access
4. Physical Layer
 - a. Purpose of the Physical Layer
 - b. Physical Layer Characteristics
 - c. Copper Cabling
 - d. UTP Cabling
 - e. Fiber-Optic Cabling
 - f. Wireless Media
5. Number Systems
 - a. Binary Number System
 - b. Hexadecimal Number System
6. Data Link Layer
 - a. Purpose of the Data Link Layer
 - b. Topologies
 - c. Data Link Frame
7. Ethernet Switching
 - a. Ethernet Frames
 - b. Ethernet MAC Address
 - c. The MAC Address Table
 - d. Switch Speeds and Forwarding Methods
8. Network Layer
 - a. Network Layer Characteristics
 - b. IPv4 Packet
 - c. IPv6 Packet
 - d. How a Host Routes
 - e. Introduction to Routing
9. Address Resolution
 - a. MAC and IP
 - b. ARP
 - c. IPv6 Neighbor Directory
10. Basic Router Configuration
 - a. Configure Initial Configuration Steps
 - b. Configure Interfaces

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- c. Configure the default gateway
- 11. IPv4 Addressing
 - a. IPv4 Address Structure
 - b. IPv4 Unicast, Broadcast, and Multicast
 - c. Types of IPv4 Addresses
 - d. Network Segmentation
 - e. Subnet an IPv4 Network
 - f. Subnet a Slash 16 and a Slash 8 Prefix
 - g. Subnet to Meet Requirements
 - h. VLSM
 - i. Structured Design
- 12. IPv6 Addressing
 - a. IPv4 Issues
 - b. IPv6 Address Representation
 - c. IPv6 Address Types
 - d. GUA and LLA Static Configuration
 - e. Dynamic Addressing for IPv6 GUAs
 - f. Dynamic Addressing for IPv6 LLAs
 - g. IPv6 Multicast Addresses
 - h. Subnet an IPv6 Network
- 13. ICMP
 - a. ICMP Messages
 - b. Ping and Traceroute Tests
- 14. Transport Layer
 - a. Transportation of Data
 - b. TCP Overview
 - c. UDP Overview
 - d. Port Numbers
 - e. TCP Communication Process
 - f. Reliability and Flow Control
 - g. UDP Communication
- 15. Application Layer
 - a. Application, Presentation, and Session
 - b. Peer-to-Peer
 - c. Web and Email Protocols
 - d. IP Addressing Services
 - e. File Sharing Services
- 16. Network Security Fundamentals
 - a. Security Threats and Vulnerabilities

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- b. Network Attacks
- c. Network Attack Mitigations
- d. Device Security
- 17. Build a Small Network
 - a. Devices in a Small Network
 - b. Small Network Application and Protocols
 - c. Scale to Larger Networks
 - d. Verify Connectivity
 - e. Host and IOS Commands
 - f. Troubleshooting and Methodologies
 - g. Troubleshooting Scenarios

Grade Scale

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

Course Evaluation

Final grades will be calculated according to the following criteria:

Labs	30%
Study Guides	10%
Module Tests	30%
Final Exam	30%

Course Policies

1. No food, drinks, or use of tobacco products in class.
2. Electronic devices not being used for the class, such as phones and headphones, must be turned off while in class.
3. Do not bring children to class.
4. Certification: If a student passes the certification test that is associated with this class, you will receive an “A” on the final exam and credit for 25% of your labs. If you have missed a previous test, you must still take the final exam to substitute for that grade.
5. Attendance Policy: Three absences are allowed. If a student is tardy to class or departs early three (3) times, it will be equal to one (1) absence. Each absence beyond three absences will result in a 2 point deduction from your final grade.
6. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop coming to class and fail to drop the course, you will earn an ‘F’ in the course.
7. Tools: Return all tools and/or software to their designated place.

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8. A grade of 'C' or better must be earned in this course for credit toward degree requirement.
9. Additional course policies, as defined by the individual course instructor, will be outlined in the course addendum and provided by the instructor.

Disabilities Statement

The Americans with Disabilities Act of 1990 and Section 504 of the Rehabilitation Act of 1973 are federal anti-discrimination statutes that provide comprehensive civil rights for persons with disabilities. LIT provides reasonable accommodations as defined in the Rehabilitation Act of 1973, Section 504 and the Americans with Disabilities Act of 1990, to students with a diagnosed disability. The Special Populations Office is located in the Eagles' Nest Room 129 and helps foster a supportive and inclusive educational environment by maintaining partnerships with faculty and staff, as well as promoting awareness among all members of the Lamar Institute of Technology community. If you believe you have a disability requiring an accommodation, please contact the Special Populations Coordinator at (409)839-2018. You may also visit the online resource at [Special Populations - Lamar Institute of Technology \(lit.edu\)](http://Special Populations - Lamar Institute of Technology (lit.edu))

Technical Requirements (for courses using Blackboard)

The latest technical requirements, including hardware, compatible browsers, operating systems, software, Java, etc. can be found online at:

https://help.blackboard.com/en-us/Learn/9.1_2014_04/Student/015_Browser_Support/015_Browser_Support_Policy

A functional broadband internet connection, such as DSL, cable, or WiFi is necessary to maximize the use of the online technology and resources.

Student Code of Conduct Statement

It is the responsibility of all registered Lamar Institute of Technology students to access, read, understand and abide by all published policies, regulations, and procedures listed in the LIT Catalog and Student Handbook. The LIT Catalog and Student Handbook may be accessed at www.lit.edu or obtained in print upon request at the Student Services Office. Please note that the online version of the LIT Catalog and Student Handbook supersedes all other versions of the same document.

Certification Requirement

CNTT majors are required to earn certification in one of the following areas prior to graduation.

- Cisco Certified Network Associate (CCNA)
- CompTIA A+ Certification
- CompTIA Network + Certification
- CompTIA Security+ Certification
- Microsoft Certified Solutions Associate (MCSA)

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This course covers part of the material to prepare for the Cisco Certified Network Associate (CCNA) certification. All three Cisco courses must be completed to cover the material for the CCNA exam. The CCNA credential can be earned by taking the 200-301 CCNA exam.

Students are responsible for scheduling and paying for the certification through the LIT Testing Center. More information about the certification can be found online at [CCNA - Training & Certifications - Cisco](#).