Computer Integration (CPMT 2333)

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

Prerequisite/Co-requisite: None

Course Description

Integration of hardware, software, and applications. Customization of computer systems for specific applications such as engineering, multimedia, or data acquisition.

Required Textbook and Materials

West, Dean, Andrews, CompTIA® Network+ Guide to Networks, 8th Edition**. Cengage, ISBN-13: 9781337569330**

a. How to buy your Course Materials Step 1: Sign into **Blackboard** and click on **this course** Step 2: Click on the Cengage link: **Getting Started** in the *Getting Started with Cengage MindTap* section. Step 3: Create or sign into your Cengage account to access or purchase the materials for this course.

NOTE: If you are taking additional courses that use Cengage materials, you can save by purchasing a Cengage Unlimited plan, which gives you access to all Cengage eTextbooks and online homework platforms for one price. Visit cengage.com/unlimited or your campus bookstore to learn more.
b. Beware of sites that are selling discounted codes. These sources are likely unauthorized sellers who have acquired access codes illegally, and transactions with such sources may pose a risk to your personal information.
c. Need help? Visit startstrong.cengage.com for step-by-step registration instructions and videos.

Course Objectives

Knowing how to install, configure, and troubleshoot a computer network is a highly marketable and exciting skill. This course first introduces the fundamental building blocks that form a modern network, such as protocols, media, topologies, and hardware. It then provides in depth coverage of the most important concepts in contemporary networking, such as TCP/IP, Ethernet, wireless transmission, virtual networks, security, and troubleshooting. After completing this course and completing the exercises, you will be prepared to select the best network design, hardware, and software for your environment. You will also have the skills to build a network from scratch and maintain, upgrade, troubleshoot, and manage an existing network. Finally, you will be well-prepared to pass CompTIA's Network+ N10-007 certification exam.

Specific topic coverage includes:

- Introduction to Networking
- Network Infrastructure and Documentation
- Addressing on Networks
- Network Protocols and Routing
- Network Cabling
- Wireless Networking

- Virtualization and Cloud Computing
- Subnets and VLANs
- Network Risk Management
- Security in Network Design
- Network Performance and Recovery
- Wide Area Networks

Course Outline

1. Introduction to Networks
   a. Network Models
   b. Client-Server Applications
   c. Network Hardware
   d. The Seven-Layer OSI Model
   e. Safety Procedures and Policies
   f. Troubleshooting Network Problems
2. Network Infrastructure and Documentation
   a. Components and Structured Cabling
   b. Network Documentation
   c. Change Management
3. Addressing on Networks
   a. MAC addresses
   b. IP addresses
   c. Ports and Sockets
   d. Domain Names and DNS
   e. Troubleshooting Address Problems
4. Network Protocols and Routing
   a. TCP/IP Core Protocols
   b. Routers and How They Work
   c. Troubleshooting Route Issues
5. Network Cabling
   a. Transmission Basics
   b. Copper Cable
   c. Fiber Optic Cable
   d. Troubleshooting Tools
6. Wireless Networks
   a. Characteristics of Wireless Transmissions
   b. Wireless Standard for the IoT
   c. 802.11 Frames
   d. 802.11 Innovations
   e. Implementing a Wi-Fi Network
   f. Wi-Fi Network Security
   g. Troubleshooting Wi-Fi Networks
7. Review
   a. Midterm
8. Virtualization and Cloud Computing
   a. Virtualization
   b. Cloud Computing
   c. Encryption Protocols
   d. Remote Access
9. Subnets and VLANs
   a. Network Segmentation
   b. Subnets
   c. VLANs
10. Network Risk Management

        a. Security Risks
        b. Security Assessment
        c. Physical Security
        d. Device Hardening
        e. Certification, Security Policies for Users

11. Security in Network Design
        a. Network Security Devices
        b. Switch Management
        c. Authentication, Authorization, and Accounting
        d. Access Control Technologies
        e. Wireless Network Securities

12. Network Performance and Discovery
        a. Collecting Network Data
        b. Managing Network Traffic
        c. Network Availability
        d. Response and Recovery

13. Wide Area Networks
        a. WAN Essentials
        b. Layer 1 WAN Technologies
        c. Layer 2 WAN Technologies
        d. Wireless WANs

14. Review
        a. Final Exam

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%
Chapter Tests	30%
Final Exam	30%

Course Policies

1. 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.
2. If you wish to drop a course, the student is responsible for initiating and completing the drop process. If you stop participating in the course and fail to drop the course, you will earn an 'F' in the course.
3. A grade of 'C' or better must be earned in this course for credit toward degree requirement.
4. 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)

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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/Learn/Student/Getting_Started/Browser_Support/Browser_Checker.
A functional broadband internet connection, such as DSL, cable, or Wi-Fi 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.

Starfish

LIT utilizes an early alert system called Starfish. Throughout the semester, you may receive emails from Starfish regarding your course grades, attendance, or academic performance. Faculty record student attendance, raise flags and kudos to express concern or give praise, and you can make an appointment with faculty and staff all through the Starfish home page. You can also login to Blackboard or MyLIT and click on the Starfish link to view academic alerts and detailed information. It is the responsibility of the student to pay attention to these emails and information in Starfish and consider taking the recommended

actions. Starfish is used to help you be a successful student at LIT. For more information: https://www.lit.edu/step/starfish.

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
- CompTIA Linux+ Certification

This course covers the material to prepare for CompTIA's Network+ certification, exam number N10-007. 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 https://certification.comptia.org/certifications/network.