Course Description

Examination of data communications fundamentals including the transmission and reception of data signals, networking and network architecture, and communications protocols. Provides a baseline level of knowledge for success in industry and preparation for networking certifications, including the Network+, MCSA, MCSE, CNA and CCNA designations.

Course Textbook


Course Learning Objectives

Upon completion of this course, students should be able to:

1. Describe and discuss data networking standards, recalling names, and order of the seven layers of the OSI reference model and the TCP/IP protocol stack.
2. Discuss the different protocols that make up the TCP/IP suite, including: IP, TCP, UDP, ARP, and RARP, as well as support protocols DNS, BOOTP, TFTP, DHCP, ICMP, SMTP, HTTP, HTTPS, and NTP.
3. List network topologies, both standard and proprietary, and recall common network hardware and utilities used for troubleshooting.
4. Explain how Microsoft Windows network communication protocols are implemented in a TCP/IP network.
5. Relate the differences between switching and routing and explain how switches and routers are used in LANs and WANs.
6. Illustrate hardware configurations in token ring and Ethernet implementations.
7. Prepare network diagrams for both bus and ring network designs.

Credits

Upon completion of this course, the students will earn three (3) hours of college credit.

Course Structure

1. **Unit Learning Objectives:** Each unit contains Unit Learning Objectives that specify the measurable skills and knowledge students should gain upon completion of the unit.
2. **Written Lectures:** Each unit contains a Written Lecture, which discusses lesson material.
3. **Reading Assignments:** Each unit contains Reading Assignments from one or more chapters from the textbook. Units I-II and IV-VII contain Supplemental Readings to aid students in their course of study.
4. **Key Terms:** Key Terms are intended to guide students in their course of study. Students should pay particular attention to Key Terms as they represent important concepts within the unit material and reading.
5. **Learning Activities (Non-Graded):** At the end of each unit, textbook review questions are recommended as non-graded Learning Activities to reinforce the student’s assimilation of the material presented in the textbook.
6. **Discussion Boards:** Discussion Boards are a part of all CSU term courses. Information and specifications regarding these assignments are provided in the Academic Policies listed in the Course Menu bar.
7. **Unit Assessments:** This course contains seven unit assessments, one to be completed at the end of Unit I-VII.
8. **Unit Assignments:** Students are required to submit for grading Unit Assignments in Units I-V and VIII. Specific information and instructions regarding these assignments are provided below.
9. **Ask the Professor:** This communication forum provides you with an opportunity to ask your professor general or course content related questions.

10. **Student Break Room:** This communication forum allows for casual conversation with your classmates.

## Unit Assignments

### Unit I Assignment

**Describe the OSI Reference Model**

List the seven layers of the OSI model. Number your paper from 7-1. Write the name of the layer next to the number to which it corresponds. Describe the function of each layer, purpose of each layer, and what hardware resides at each layer within at least one paragraph for each layer. Note that only the first four layers of the OSI model have hardware associated with them.

**Example:**

- **Layer 7. Application Layer** – Tell me the function of, the purpose of, and what hardware, if any, resides at this layer.
- **Layer 6.
- **Layer 5.
- **Layer 4.
- **Layer 3.
- **Layer 2.
- **Layer 1. Physical layer** – Tell me the function of, the purpose of, and what hardware, if any, resides at this layer.

This assignment must contain an introduction and a conclusion, be a minimum two-page paper, and be appropriately cited using APA style writing.

### Unit II Assignment

**Network Topologies**

Write a paper detailing the advantages and disadvantages of the three main topologies: Ring, Bus, and Star.

Include the following in your paper:

1. Write a paragraph about each topology.
2. List the advantages and disadvantages of the type of topology and how it can be applied to the realm of data communication.
3. List the wiring types associated with the topology, and describe how they can be used.
4. Post a diagram of each topology.

Do this for each of the three types of topologies: Ring, Bus, and Star. Your response should be a minimum two-page paper with tables, graphs, and appendices appropriately cited using APA style writing.

### Unit III Assignment

**Testing Your Bandwidth**

The Internet provides a lot of different sites to test your bandwidth. Such sites include [speedtest.net](http://speedtest.net), [toast.net](http://toast.net), and [testmy.net](http://testmy.net). Find your preferred broadband testing website, and perform the following test:

1. Test your current bandwidth, and write down the results. Compare your results against national averages (where applicable). How did your bandwidth perform? Do you have the fastest Internet available from your Internet Service Provider (ISP)?
2. Reset your modem or Internet connection along with your internal router and switch (if you have one). Test your bandwidth again. Post your results to this assignment, and answer the following questions:
   a. Were you surprised at the results?
   b. Why is it important to know how to check your bandwidth?
3. Discuss how a bandwidth is defined within the realm of IT and what factors may affect the speed of your Internet.
Your assignment should be a minimum two-page paper with any graphs, tables, or appendices appropriately cited using APA style writing.

Unit IV Case Project

Review Case Project 10-2 on page 327 of the textbook. After carefully examining Figure 10-21 and cross-referencing it against the concepts in Chapter 10, answer questions one through eight. Create any tables or graphs as you see fit, and properly re-name them according to the associated question. For example, question one asks you to create a detailed table; this should be named CaseProject10_2_Question1.

Your assignment should be a minimum two pages with any graphs, tables, or appendices appropriately cited using APA style writing.

Unit V Case Project

Review Case Project 12-1 on page 419 of the textbook. After reading through this Case Project and reviewing the concepts throughout Chapter 12, write one to two paragraphs on each topic below, and describe how it applies to the realm of data communication. Also discuss what type of damage these computer infections can do to data in a computer.

1. Virus
2. Trojan
3. Worm
4. Rootkit

Your assignment does not have a specific minimum, but each topic should be thoroughly discussed with any graphs, tables, or appendices appropriately cited using APA style writing.

Unit VIII Reflection Paper

For this assignment, you are asked to prepare a Reflection Paper. Now that you have finished all of the reading assignments for this course, reflect on three of the major concepts discussed in the reading, and write about those concepts. How do those concepts relate to the subject of data communication? How have those concepts affected data communication in the past? How will the concepts affect data communication in the future? Will these concepts affect you in your career? Why, or why not?

The purpose of this assignment is to provide you with an opportunity to reflect on the material that you have read and to expand on your reading.

The writing that you submit must meet the following requirements:

- Be at least two pages in length
- Include your thoughts about the major concepts that you select
- Explain how the concepts impact data communication
- Explain how the concepts apply to your career

You may only use your textbook as a reference. All paraphrased and quoted material from the textbook must be properly cited.

Submitting Course Papers/Projects

Once you have completed your papers/projects, submit your completed papers/projects by uploading through the “view/complete” link under the Assignment tab in each unit. Do not e-mail your paper directly to your professor. By using the Assignment tab, your university record will automatically be updated to indicate you have submitted your papers/projects and the assignment will be provided to your professor for grading. Instructions for submitting your assignment can be found under the Assignment tab in each unit.

APA Guidelines

CSU requires that students use the APA style for papers and projects. Therefore, the APA rules for formatting, quoting, paraphrasing, citing, and listing of sources are to be followed. A document titled “APA Guidelines Summary” is available.
for you to download from the APA Guide Link, found in the Learning Resources area of the myCSU Student Portal. It may also be accessed from the Student Resources link on the Course Menu. This document provides links to several internet sites that provide comprehensive information on APA formatting, including examples and sample papers.

**CSU Grading Rubric for Papers/Projects**

The course papers will be graded based on the CSU Grading Rubric for all types of papers. In addition, all papers will be submitted for electronic evaluation to rule out plagiarism. Course projects will contain project specific grading criteria defined in the project directions. To view the rubric, click the Academic Policies link on the Course Menu, or by accessing the CSU Grading Rubric link, found in the Learning Resources area of the myCSU Student Portal.

**Communication Forums**

These are non-graded discussion forums that allow you to communicate with your professor and other students. Participation in these discussion forums is encouraged, but not required. You can access these forums with the buttons in the Course Menu. Instructions for subscribing/unsubscribing to these forums are provided below.

[Click here for instructions on how to subscribe/unsubscribe and post to the Communication Forums.](#)

**Ask the Professor**

This communication forum provides you with an opportunity to ask your professor general or course content questions. Questions may focus on Blackboard locations of online course components, textbook or course content elaboration, additional guidance on assessment requirements, or general advice from other students.

Questions that are specific in nature, such as inquiries regarding assessment/assignment grades or personal accommodation requests, are NOT to be posted on this forum. If you have questions, comments, or concerns of a non-public nature, please feel free to email your professor. Responses to your post will be addressed or emailed by the professor within 48 hours.

Before posting, please ensure that you have read all relevant course documentation, including the syllabus, assessment/assignment instructions, faculty feedback, and other important information.

**Student Break Room**

This communication forum allows for casual conversation with your classmates. Communication on this forum should always maintain a standard of appropriateness and respect for your fellow classmates. This forum should NOT be used to share assessment answers.

**Grading**

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<tr>
<th>Component</th>
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<tr>
<td>Discussion Boards (8 @ 2%)</td>
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<td>Assessments (7 @ 3%)</td>
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<td>Assignments (3 @ 6%)</td>
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<td>Reflection Paper</td>
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**Course Schedule/Checklist (PLEASE PRINT)**

The following pages contain a printable Course Schedule to assist you through this course. By following this schedule, you will be assured that you will complete the course within the time allotted.
By following this schedule, you will be assured that you will complete the course within the time allotted. Please keep this schedule for reference as you progress through your course.

### Unit I: Networking Essentials

**Review:**
- Unit Study Guide
- **Learning Activities:** See Study Guide

**Read:**
- Chapter 1: What is a Computer Network?
- Chapter 2: Network Topology
- Chapter 3: Networking Hardware
- **Supplemental Reading:** See Study Guide

**Discuss:**
- Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)

**Submit:**
- Assessment by Tuesday, Midnight (Central Time)
- Assignment by Tuesday, Midnight (Central Time)

**Notes/Goals:**

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### Unit II: LAN Technologies

**Review:**
- Unit Study Guide
- **Learning Activities:** See Study Guide

**Read:**
- Chapter 4: Ethernet Technology
- Chapter 5: Token-Ring, FDDI, and Other LAN Technologies
- **Supplemental Reading:** See Study Guide

**Discuss:**
- Discussion Board Response: Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- **Discussion Board Comment:** Comment on another student’s Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- Assessment by Tuesday, Midnight (Central Time)
- Assignment by Tuesday Midnight (Central Time)

**Notes/Goals:**
## ITC 3450, Introduction to Data Communication

### Course Schedule

#### Unit III: Network Design, Troubleshooting, and Protocols

**Review:**
- Unit Study Guide
- **Learning Activities:** See Study Guide

**Read:**
- Chapter 6: Network design and Troubleshooting Scenarios
- Chapter 7: Low-level Protocols
- Chapter 8: The TCP/IP Protocols

**Discuss:**
- **Discussion Board Response:** Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- **Discussion Board Comment:** Comment on another student's Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- Assessment by Tuesday, Midnight (Central Time)
- Assignment by Tuesday, Midnight (Central Time)

#### Unit IV: Switching, Routing, and Security

**Review:**
- Unit Study Guide
- **Learning Activities:** See Study Guide

**Read:**
- Chapter 10: Switching and Routing
- Chapter 11: Network Management and Security

**Discuss:**
- **Discussion Board Response:** Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- **Discussion Board Comment:** Comment on another student's Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- Assessment by Tuesday, Midnight (Central Time)
- Case Project by Tuesday, Midnight (Central Time)

Notes/Goals:
## Unit V: E-mail, FTP, and Telnet

**Review:**
- Unit Study Guide
- **Learning Activities:** See Study Guide

**Read:**
- Chapter 12: Electronic Mail
- Chapter 13: FTP and Telnet

**Discuss:**
- **Discussion Board Response:** Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- **Discussion Board Comment:** Comment on another student's Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- Assessment by Tuesday, Midnight (Central Time)
- Case Project by Tuesday, Midnight (Central Time)

## Unit VI: Multimedia and the Internet

**Review:**
- Unit Study Guide
- **Learning Activities:** See Study Guide

**Read:**
- Chapter 14: Multimedia Networking
- Chapter 15: The Internet

**Discuss:**
- **Discussion Board Response:** Submit your response to the Discussion Board question by Saturday, Midnight (Central Time)
- **Discussion Board Comment:** Comment on another student’s Discussion Board response by Tuesday, Midnight (Central Time)

**Submit:**
- Assessment by Tuesday, Midnight (Central Time)

Notes/Goals:
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