



ENLIGHTIUM ACADEMY

Ignitia™ Career and Technical Education
Electives

Introduction to Network Systems Design

Enlightium Academy invites you to open the door to career and college readiness with Career and Technical Education (CTE) courses from Alpha Omega Publications - Ignitia™.

These rigorous, hands-on courses for grades 7-12 promote critical thinking, emphasize problem solving, and encourage students to take responsibility for their own learning. With 24 CTE courses divided into six clusters, these courses put students on practical paths to post-graduate success.

Should you have any questions about the curriculum, please contact support@enlightiumacademy.com or call Enlightium Academy Customer Support at (866) 488-4818 ext. 2017.

If you have questions about technical support or product configuration, please see the information below for Alpha Omega Publications.

Alpha Omega Publications Technical Support

Alpha Omega Publications' technical support is Ignitia™'s full-service technical support system. We exist to promote and preserve our customers' satisfaction. Our services include:

- Technical Support
- Product Configuration and Update Management

Please use the following information to contact Alpha Omega Publications' technical support:

Online:

Access our helpful Technical Support website simply by clicking on the life preserver located in the upper-right corner of any screen in our program!

Telephone:

Toll Free: 1-877-251-6662
Monday –Friday 7 a.m. to 5 p.m. (CT)

NETWORK SYSTEM DESIGN

COURSE OVERVIEW

The Network System Design course will provide students with an understanding of computer networks and how they operate, as well as a basic understanding of how to manage and maintain computer networks. These skills will provide students with the ability to design, configure, and troubleshoot networks of all sizes.

Students will learn the basics of network design, including how to identify network requirements and determine the proper network architecture. They will be instructed on the requirements of network models, as well as be introduced to local area networks. Students will also learn about Internet Protocol and the basics of routing data on a network.

Students will be introduced to wide area networks and network security issues. In addition, students will learn about network management, including monitoring and troubleshooting. Last, students will learn about network operating systems and their role in connecting computers and facilitating communications.

Objectives

- Understand computer networks and their functions, as well as know how to analyze business and technical goals of a network to effectively meet customer needs.
- Identify requirements to successfully support network users, applications, and devices. They will also understand network architecture and topology, protocols, and services of local and wide area networks.
- Identify principles and operation of equipment like wire and circuits, as well as of standards such as open system interconnection, TCP/IP, and high-speed networking.
- Demonstrate knowledge of security requirements and data protection on a network, as well as the role of security tools such as routers, firewalls, and virtual private networks.
- Understand network operating systems and be able to support computer networks.

For topics in this course, it is helpful for students to be familiar with the basics of computer hardware (desktop and laptop), as well as desktop operating systems.

If students are not familiar with these topics, it is recommended, though not required, that they be introduced to computer hardware and desktop or workstation operating systems before starting this course. That includes examining hardware devices such as motherboards, hard drives, and processing chips and exploring the features and functions of a workstation operating system.

NETWORK SYSTEM DESIGN	
UNIT 1: INTRODUCTION TO NETWORK DESIGN	
Assignment Titles	
1. Course Overview	10. Logical Network Design – Addressing and Routing Protocols
2. Customer Needs and Goals	11. Project: Exploring Higher Math
3. Project: Designing a Business Network	12. Network Architectural Models – Topologies and Classifications
4. Network Design: Network Infrastructure	13. Quiz 2: Network Architecture
5. Network Design: Physical and Functional Network Requirements	14. Project: Special Project
6. Project: Office Planning	15. Unit 1 Test
7. Quiz 1: Network Requirements	16. Course Project Part 1: Physical and Functional Requirements of a Network
8. Network Architecture Components – Physical and Functional	17. Glossary and Credits
9. Project: Connecting Physical to Function	

NETWORK SYSTEM DESIGN
UNIT 2: NETWORKING MODELS AND LOCAL AREA NETWORKS

Assignment Titles

- | | |
|---------------------------------------------------------|-----------------------------------------------------------------------------------|
| 1. The Network Reference Models | 9. Project: State Your Case, Argue For Each |
| 2. Project: Port Sniffing | 10. Wireless LANs and Security |
| 3. The OSI Networking Model | 11. Project: Playing With Wireless |
| 4. The TCP/IP Networking Model | 12. Quiz 2: Local Area Networks – Topologies, Transmission Media and Technologies |
| 5. Project: Researching TCP/IP | 13. Project: Special Project |
| 6. Quiz 1: TCP/IP and OSI Networking – The Fundamentals | 14. Unit 2 Test |
| 7. LAN Fundamentals: Media, Topologies and Protocols | 15. Course Project Part 2: Local Area Network |
| 8. LAN Technologies: Ethernet | 16. Glossary and Credits |

NETWORK SYSTEM DESIGN
UNIT 3: INTERNET PROTOCOL (IP): ADDRESSING AND ROUTING

Assignment Titles

- | | |
|--------------------------------------------------------|--------------------------------------------------|
| 1. Addressing Fundamentals | 8. IP Routing Protocols: Distance Vector Routing |
| 2. IP Address: Classful Addressing | 9. Project: Routing Tables |
| 3. Project: IP Address Ranges and Subnetting | 10. IP Routing Protocols: Link State Routing |
| 4. Subnetting, Supernetting and Classless Addressing | 11. Project: Router Security |
| 5. Project: Researching Classless Inter-Domain Routing | 12. Quiz 2: IP Routing |
| 6. Quiz 1: IP Addressing | 13. Project: Special Project |
| 7. Routing Basics | 14. Unit 3 Test |
| | 15. Course Project Part 3: Internet Protocol |
| | 16. Glossary and Credits |

NETWORK SYSTEM DESIGN
UNIT 4: WIDE AREA NETWORKS AND NETWORK SECURITY

Assignment Titles

- | | |
|-------------------------------------------------|---------------------------------------------|
| 1. WAN Concepts | 9. Network Security Threats |
| 2. WAN Technologies | 10. Network Security Techniques |
| 3. Project: Connecting to the Internet Backbone | 11. Project: Analyzing Network Security |
| 4. WAN Configuration | 12. Quiz 2: Network Security |
| 5. Project: What Do All These Boxes Look Like? | 13. Project: Special Project |
| 6. Quiz 1: Wide Area Networks | 14. Unit 4 Test |
| 7. Understanding Network Security | 15. Course Project Part 4: Network Security |
| 8. Project: Creating a Network Security Policy | 16. Glossary and Credits |

NETWORK SYSTEM DESIGN
UNIT 5: NETWORK MANAGEMENT AND NETWORK OPERATING SYSTEMS

Assignment Titles

- | | |
|-----------------------------------------------------|---------------------------------------------------------|
| 1. Network Management Design | 9. The Windows Server |
| 2. Project: Designing a Network Management Plan | 10. The Linux Operating System |
| 3. Network Management Architecture | 11. Project: Installing and Using Linux OS |
| 4. Network Management Tools and Protocols | 12. Quiz 2: Network Operating Systems |
| 5. Project: Using Network Troubleshooting Tools | 13. Project: Special Project |
| 6. Quiz 1: Network Management Strategies and Design | 14. Unit 5 Test |
| 7. Network Operating Systems | 15. Course Project Part 5: Network Management Protocols |
| 8. Project: Researching Network Operating Systems | 16. Glossary and Credits |

NETWORK SYSTEM DESIGN
UNIT 6: COURSE REVIEW, AND EXAM

Assignment Titles

- | | |
|--------------------------------------------------|---------|
| 1. Course Project Part 6: Network Administration | 3. Exam |
| 2. Review | |