

Northwest Arkansas Community College
Business and Computer Information Systems Division

Discipline Code

NTWK

Course Number

2014

Course Title

Networking and Information Systems

Catalog Description

This course provides an introduction to networking and information systems. Topics include: Router and switch hardware and software; networks; IPv4 subnetting; IPv6; cabling; the OSI model and protocols commonly used in the networking environment. Students will gain hands-on experience in the installation of a local area network including initial router setup. Students completing this course will be the preparation necessary for success in the following industry-recognized certifications: Cisco CCNA, Cisco Devnet+, CCNA Security, CCNA CyberOps, Cisco certified Design Associate (CCDA) and CompTIA Network+. This course is the 1st semester of preparation for CCNA and certification mentioned above. Preparation for the CCNA certification exam should include the following courses for CCNA training (NTWK 2014, NTWK 2084, NTWK 2214, NTWK 2224). Outside Lab time will be required.

Prerequisites

Credit Hours

4

Contact hours

60

Load hours

4

Semesters Offered

Fall, Spring, On Demand

ACTS Equivalent

N/A

Grade Mode

A-F

Learning Outcomes

Students will:

- Explain the importance of and advances in modern networking technologies that support business communications and daily operations
- Explain how network communication works in data networks and the Internet
- Describe modern networking concepts like SDN, Intent based networking, IAAS, NAAS
- Recognize the devices and services that are used to support communications across an Internetwork
- Use network models to explain the layered communication model in data networks
- Describe the importance of addressing and naming schemes at various layers of data networks
- Describe the protocols and services provided by the application layer in the OSI and TCP/IP models and describe how this layer operates in various networks
- Analyze the operations and features of transport and network layer protocols and services and explain the fundamental concepts of routing
- Design, calculate, and apply subnet masks and addresses to fulfill given requirements
- Explain fundamental Ethernet concepts such as media, services, and operation
- Build a simple Ethernet network using routers and switches and use Cisco command-line interface (CLI) commands to perform basic router and switch configuration and verification
- Analyze and compare the operations and features of common application layer protocols such as HTTP, Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), Simple Mail Transfer Protocol (SMTP), Telnet, and FTP
- Utilize common network utilities to verify small network operations and analyze data traffic

General Education Outcomes Supported

- Students can write clear, coherent, well-organized documents, substantially free of errors.
- Students will demonstrate technological fluency..
- Students demonstrate information literacy.

Standard Practices

Topics list

- Number systems; decimal, binary, and hexadecimal systems Cisco IOS (Internetwork Operating System) on network routers and switches including initial settings including passwords, IP addressing, and default gateway parameters.
- Explain how TCP/IP suite layered protocols, services, and network media support communications across data networks for end to end connectivity.

- Network protocols
- HTTP, DNS, DHCP, SMTP, SSH, FTP
- ARP, NDP, MAC, DLL
- Networking Standards and Suites ISO, TIA/EIA,
- Network segmentation using an IPv4 subnetting scheme to efficiently segment your network
- IPv6 addressing scheme
- Network tools to test and monitor network connectivity and security (Wireshark)
- Device hardening features to enhance security on networking devices.
- Troubleshooting connectivity in a small network.

Learning Activities

- This course requires some in class, hands-on work and also additional hands-on work in a virtual or on-campus computer lab.
- Lab Assignments using Lab routers and Switches and Virtual NetLab
- Cisco Packet Tracer Activities
- Hands-on activities
- Quizzes
- Final Exam

Assessments

- On-line chapter Exams in Netacad
- Hands-on lab assignments
- Packet Tracer Activities
- Hands on final Skill Based Assessment
- Comprehensive online final exam

Grading guidelines

Overall Score will be based on the grading scale below.

A = 90-100

B = 80-89

C = 70-79

D = 60-69

F = 59 & below

In addition, students will demonstrate proficiency by scoring 70% or above on The Final Skill Based Assessment to pass the class.

Revision Date

April 6, 2023