

Teacher Assessment Blueprint

Computer Networking Fundamentals



Test Code: 5910 / Version: 01

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General Assessment Information

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Test Type: The Computer Networking Fundamentals assessment is included in NOCTI's Teacher assessment battery. Teacher assessments measure an individual's technical knowledge and skills in a proctored proficiency examination format. These assessments are used in a large number of states as part of the teacher licensing and/or certification process, assessing competency in all aspects of a particular industry. NOCTI Teacher tests typically offer both a written and performance component that must be administered at a NOCTI-approved Area Test Center. Teacher assessments can be delivered in an online or paper/pencil format.

Revision Team: The assessment content is based on input from subject matter experts representing the following states: California, Georgia, Michigan, Missouri, New Jersey, New York, Oklahoma, and Pennsylvania.



11.0901- Computer Systems
Networking and
Telecommunications



Career Cluster 11-
Information Technology



15-1151.00- Computer
User Support Specialists



NATIONAL COLLEGE CREDIT RECOMMENDATION SERVICE
University of the State of New York - Regents Research Fund

In the lower division
baccalaureate/associate degree
category, 3 semester hours in
Computer Networking
Fundamentals, Computer Science,
or Computer Information Systems

Written Assessment

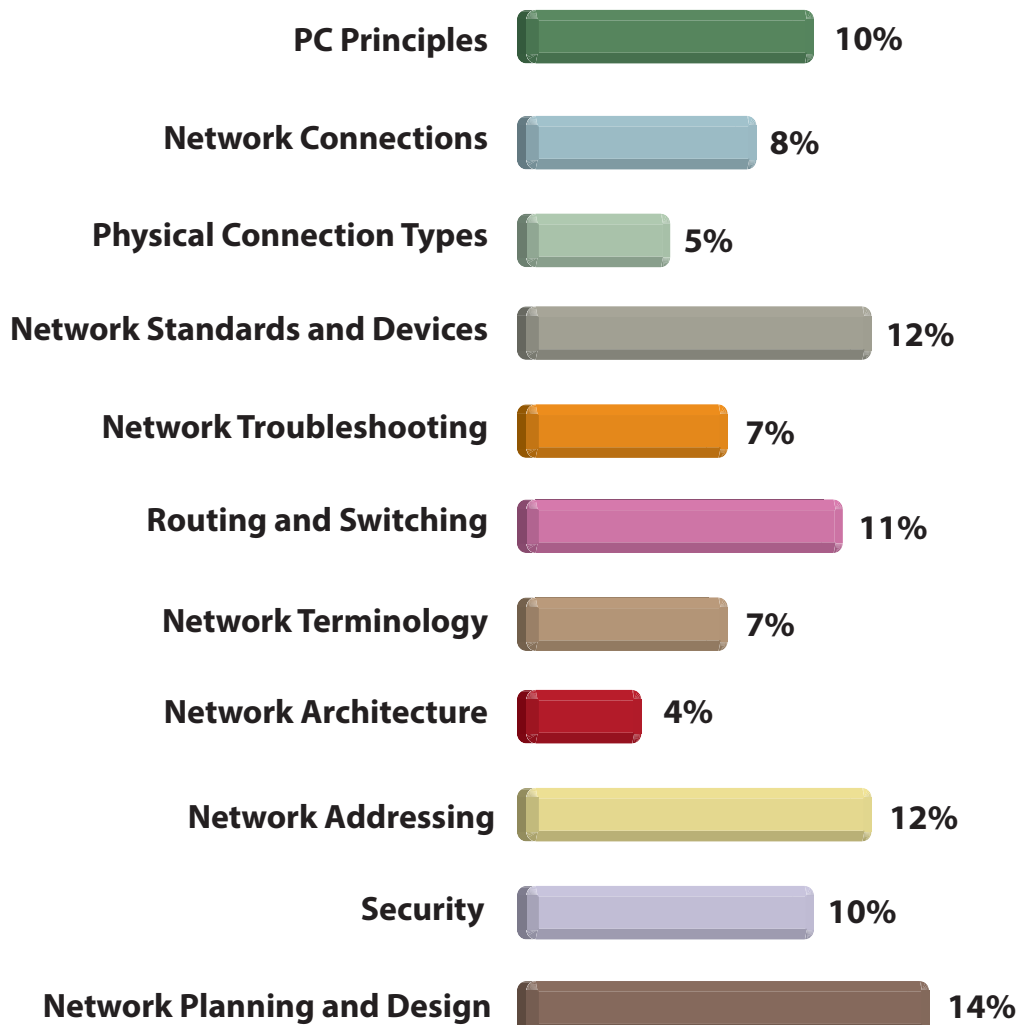
NOCTI written assessments consist of questions to measure an individual's factual theoretical knowledge.

Administration Time: 3 hours

Number of Questions: 179

Number of Sessions: This assessment may be administered in one, two, or three sessions.

Areas Covered



Specific Standards and Competencies Included in this Assessment

PC Principles

- Identify physical and equipment safety principles/practices
- Demonstrate understanding of storage methods
- Exhibit understanding of memory
- Demonstrate uses of eSATA, Bluetooth, and USB
- Identify different types and standards of processors

Network Connections

- Demonstrate understanding of Network Interface Cards (NIC)
- Identify different physical and logical characteristics of network connections
- Demonstrate use of remote access: Windows terminal services, Telnet, terminal emulation software, VPN, telephony connections, etc.
- Exhibit understanding of all types of wired and wireless communications

Physical Connection Types

- Identify cable components and uses, including twisted pair, coaxial, and fiber
- Demonstrate understanding of signal characteristics and transmission among various media types



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Specific Standards and Competencies (continued)

Network Standards and Devices

- Demonstrate understanding of OSI model layers
- Demonstrate familiarity with TCP/IP model
- Identify IEEE, EIA/TIA standards and common Port numbers
- Distinguish various types and uses of network devices

Network Troubleshooting

- Utilize ping, ipconfig, tracert, and netstat commands
- Utilize a CLI (command line interface)
- Maintain and troubleshoot cabling
- Perform local and remote loopback

Routing and Switching

- Explain the difference between static, dynamic, default, and gateway routes
- Recognize and implement basic router operations and configurations
- Implement basic switch operations and configurations
- Compare and contrast routed vs. routing protocols
- Differentiate between a collision domain and a broadcast domain

Network Terminology

- Demonstrate familiarity with various protocols and architecture terminology
- Identify various network operating systems (e.g., Windows, Linux)
- Identify various network types

Network Architecture

- Exhibit understanding of various network architectures (e.g., access, core, distribution)
- Exhibit understanding of various LAN, MAN, and WAN topologies

(Continued on the following page)

Specific Standards and Competencies (continued)

Network Addressing

- Exhibit knowledge of IP network addressing (e.g., IPv4 and IPv6)
- Differentiate between classful and classless IP addressing
- Demonstrate understanding of Media Access Control (MAC) addressing
- Convert binary, hexadecimal, and decimal numbering systems
- Create subnets from a network address

Security

- Identify and troubleshoot basic organizational/acceptable use policies
- Identify and troubleshoot network security attacks and breaches
- Identify and troubleshoot viruses, worms, and other forms of malware
- Install and maintain appropriate firewalls including NAT
- Explain general cryptography concepts

Network Planning and Design

- Exhibit understanding of analysis and planning concepts
- Compare and contrast principles of logical and physical design
- Install, maintain, and troubleshoot physical networks according to design specifications
- Describe various access methods (e.g., ISP, DSL, Broadband/ Cable, Satellite, Wireless, Mobile)
- Explain the principles of virtualization
- Configure DHCP and DNS



Sample Questions

What component connects the PC to the network?

- A. video card
- B. NIC
- C. CPU
- D. parallel port

A Virtual Private Network (VPN)

- A. uses the public Internet to create a private tunnel to connect two computers
- B. is used to create a Personal Wireless Home Network (PWHN)
- C. uses the data link layer of the TCP/IP networking model to connect calls to a landline telephone
- D. is created when a network technician calls for technical support from customer services

Fiber optic cable allows _____ waves to propagate down its length from end to end.

- A. light
- B. radio
- C. electrical
- D. sonic

IEEE 802.11 standards specify

- A. token ring
- B. wireless networks
- C. FDDI
- D. multicasting

Performing a loopback test on a router can be used to check the

- A. total number of packets sent
- B. total number of packets lost
- C. WAN interface operability
- D. IP address of the LAN interface

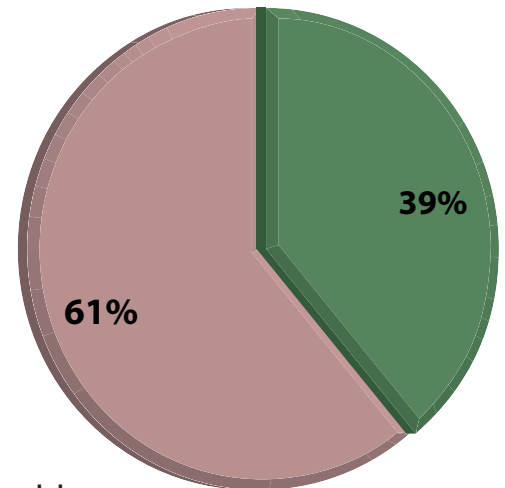
Performance Assessment

NOCTI performance assessments allow individuals to demonstrate their acquired skills by completing actual jobs using the tools, materials, machines, and equipment related to the technical area.

Administration Time: 2 hours

Number of Jobs: 2

Areas Covered:



39% Select and Connect Equipment to Set Up a Simple LAN with Two Workstations

Select the appropriate equipment to perform Job 1, create a simple LAN with two workstations, configure IP address, record information (first workstation), record information (second workstation), verify IP connectivity using a command line utility, leave IP connectivity results on screen for evaluator review, and time to complete Job 1.

61% Set Up a Workgroup, Create Users, Create Shares and Install a Printer

Name the two workstations, set up a workgroup named NOCTI, create User1 and User2 on both WS1 and WS2, create private and public folders/directories at the file structure root of WS1, create a share for the private folder/directory, on WS1, grant full control permissions on private folder/directory for User1, create a share for the public folder/directory, on WS1, grant full control permissions on public folder/directory for everyone, from WS2, verify User1 access to private folder/directory on WS1, from WS2, verify User2 access to public folder/directory on WS1, from WS2, verify User 2 is denied access to private folder on WS1, on WS1, install HP LaserJet 4100 Series printer, name printer share WS1_printer, assign only User2 printing rights to printer on WS1, and time to complete Job 2.

Sample Job

Select and Connect Equipment, to Set Up a Simple LAN with Two Workstations

Maximum Time: 1 hour

Participant Activity: The participant will select the appropriate equipment and use it to create a simple LAN with two workstations and a switch or hub, assign a private Class C address and subnet mask to the two workstations, record the results for both workstations, verify IP connectivity from each using a command line, verify the network is correctly set up according to specifications, and leave results for the evaluator.

