



Clemson University - Center for Corporate Learning
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Education & Training Plan

IT Network Professional with CompTIA Network+ Certificate Program with Externship

Student Full Name: _____

Start Date: _____ End Date: _____

Program includes National Certification & an Externship Opportunity
Mentor Supported

IT Network Professional with CompTIA Network+ Certificate Program with Externship

Course Code: CLEM-IT-CTN
Program Duration: 6 Months
Course Contact Hours: 375
Student Tuition: \$3,999

The IT Network Professional with CompTIA Network+

Computer Technology Industry Association (CompTIA) Network+ training offers midlevel certification to for network professionals. Designed to ensure competency of network technicians in configuring and supporting TCP/IP clients and the OSI model, CompTIA Network+ training and certification ensures students have the skills necessary for hardware setup, network design, cabling, configuration, installation, troubleshooting and support. Earning CompTIA Network+ Certification means that the individual possess the knowledge and skills necessary to be a successful network professional offering a nationally-recognized and industry-recognized credential for experienced network technicians. Indeed, the most widely known technology companies recommend or require CompTIA Network+ Certification for their networking technicians.

The IT Network Professional with CompTIA Network+ Program

The CompTIA Network+ course provides students with the basic knowledge and skills necessary to become an IT network practitioner. This course is designed to fully prepare students to sit for and pass the CompTIA Network+ Certification exam. Students will gain the knowledge and skills necessary to manage, maintain, troubleshoot, install, operate, and configure basic network infrastructure as well as describe networking technologies, understand basic design principles, adhere to wiring standards, and use testing tools. Additional job roles for prospective candidates include network technician, network installer, network administrator, help desk technician and IT cable installer.

Education and National Certifications

- Students should have or be pursuing a high school diploma or GED.
- There are no state approval and/or state requirements associated with this program.
- There are several National Certification exams that are available to students who successfully complete this program:
 - **CompTIA Network+ (N10-005) Certification Exam from CompTIA®**
 - **Microsoft Office Specialist (MOS) Certification Exam.**

Program Objectives

At the conclusion of this program, students will be able to:

- Summarize DNS concepts and its components, and increasingly converged networks
- Explain network structure, end and intermediate devices, and the interconnecting media
- Distinguish between circuit-switched and packet-switched communications
- Describe the role of addressing and naming in network communications
- Explain the purpose and function of protocols and standards in network communications
- Explain how protocols enable communications between different network devices
- Distinguish between networking protocols and networking standards
- Explain the advantages of using a layered model to describe network functionality
- Describe the role of each layer in the OSI reference model and the TCP/IP stack
- Identify virtual network components
- Describe the functions of the three upper OSI model layers
- Describe the function of well-known TCP/IP Application Layer protocols
- Explain the principles of network client–server operation
- Microsoft Office

National Certification

Upon successful completion of this Clemson University program, students would be eligible to sit for the CompTIA Network+ Certification Exam from CompTIA® and the Microsoft Office Specialist (MOS) exam. Although there are no state approval, state registration or other state requirements for this program, students who complete this program at Clemson University will be prepared and are eligible to sit for this national certification exam. Students who complete this program are encouraged to complete the externship option with their program. Students who complete this program can and do sit for the MOS national certification exams and are qualified, eligible and prepared to do so. Clemson University works with each student to complete the exam application and register the student to take their national certification exam.

Externship / Hands on Training / Practicum

Although not a requirement, once students complete the program, they have the ability to participate in an externship and/or hands on practicum so as to practice the skills necessary to perform the job requirements of a professional in this field. Students will be assisted with completing a resume and/or other requirements necessary to work in this field. All students who complete this program are eligible to participate in an externship and will be placed with a participating organization near their location. Clemson University works with national organizations and has the ability to place students in externship opportunities nationwide.

Clemson University contact: If students have any questions regarding this program including national certification and externships, **they should call Juanita Durham of Clemson University at 864.656.3984 or via email at jdrhm@clemsion.edu.**

Note: No refunds can be issued after the start date published in your Financial Award document.



About Clemson University!

Clemson Online, a unit reporting directly to the Provost, works closely with leadership teams across the University to develop, market, and deliver top-quality courses and programs in blended and online formats. The office provides vision, leadership, coordination, and expertise in support of faculty design, delivery, and evaluation of technology-enhanced, blended, and fully online courses and instructional materials. Dynamic, transformative, and unique eLearning opportunities characterize Clemson's approach to online teaching and learning.

Our Mission: Clemson Online provides strategic leadership for online education, emphasizing innovative teaching and superior learning outcomes to maximize student success in 21st-century academic and professional contexts.

Our Vision: Clemson Online will define the public web-grant university through measurable achievements in online education, research, and service.

The office is committed to pursuing strategic opportunities, providing supportive resources, promoting superior educational quality, and ensuring faculty involvement and responsibility in shaping Clemson's online future.



Clemson University and Pearson Education

The Clemson University's Office of Professional and Continuing Education eLearning programs were developed in partnership with Pearson Education to produce the highest quality, best-in-class content and delivery necessary to enhance the overall student learning experience, boost understanding and ensure retention. Pearson Education is the premier content and learning company in North America offering solutions to the higher education and career training divisions of colleges and universities across the country aimed at driving quality education programs to ensure student success. Please visit us at www.pearson.com.

About Pearson Education

Welcome to Pearson. We have a simple mission: to help people make more of their lives through learning. We are the world's leading learning company, with 40,000 employees in more than 80 countries helping people of all ages to make measurable progress in their lives. We provide a range of education products and services to institutions, governments and direct to individual learners, that help people everywhere aim higher and fulfil their true potential. Our commitment to them requires a holistic approach to education. It begins by using research to understand what sort of learning works best, it continues by bringing together people and organizations to develop ideas, and it comes back round by measuring the outcomes of our products.

IT Network Professional with CompTIA N+ Program Detailed Student Objectives:

COMPUTER NETWORKING OVERVIEW

- Summarize DNS concepts and its components
- Identify the benefits and challenges of increasingly converged networks
- Describe the role and impact of networks on daily business and work
- Explain the structure of a network, including end devices and intermediate devices, and the interconnecting media
- Distinguish between circuit-switched and packet-switched communications
- Describe the role of addressing and naming in network communications
- Explain the purpose/ function of protocols and standards in network communications
- Explain how protocols enable communications between completely different network devices
- Distinguish between networking protocols and networking standards
- Explain the advantages of using a layered model to describe network functionality
- Describe the role of each layer in the OSI reference model and the TCP/IP stack
- Identify virtual network components
- Describe the functions of the three upper OSI model layers
- Describe the function of well-known TCP/IP Application Layer protocols and their related services
- Explain the principles of network client–server operation

THE TRANSPORT LAYER

- Explain the operation of TCP
- Describe network applications that use TCP
- Explain the segmentation, port addressing, and reliability functions of the Transport Layer
- Describe the use of port numbers in client-server communications
- Identify the port numbers of well-known network applications
- Explain the operation of UDP
- Describe network applications that use UDP

THE NETWORK LAYER

- Describe the role of the Network Layer in enabling communication from one end device to another end device
- Explain how to group connected devices into networks, internetworks, or subnetworks
- Describe the function and features of the Internet Protocol
- Explain the function of gateways in enabling communication into and out of a local network
- Describe how to apply the hierarchical addressing feature of the Network Layer in allowing communication between networks
- Describe the function of routers in enabling internetworking
- Explain the features of static routing
- Describe the advantages and disadvantages of static routing
- Explain the operation of dynamic routing
- Describe the features of distance vector and link state routing protocols

IP ADDRESSING

- Describe the structure and features of IPv6 addresses
- Calculate an IPv4 addressing scheme given the relevant information and design criteria
- Explain the use of subnet masks in dividing networks and determining the network and host portions of an IPv4 address range

- Convert between 8-bit binary and decimal numbers
- Explain the structure and features of IPv4 addresses
- Describe the types and purposes of different IPv4 addresses
- Describe the properties of IPv4 address classes
- Explain how network devices are assigned IPv4 addresses
- Describe the purpose and operation of network address translation
- Explain the use of Internet Control Messaging Protocol utilities to test and verify network operation

THE DATA LINK LAYER

- Explain the role of the TCP/IP Network Access Layer in data transmission
- Describe different types of media access controls
- Describe how the Data Link Layer prepares data for transmission on network media
- Explain the process of encapsulating packets into frames to facilitate media access
- Describe the Data Link Layer and Physical Layer features of the Ethernet standard
- Explain the functions of the fields of the Ethernet frame
- Describe the features and operation of Ethernet media access control
- Explain Address Resolution Protocol
- Explain the Ethernet switch frame-forwarding process
- Describe the purpose and features of virtual local area networks
- Describe the purpose and operation of Spanning Tree Protocol
- Describe wide area network technologies

THE PHYSICAL LAYER

- Describe the configuration and operation of a wireless network
- Differentiate between logical network topologies and physical network topologies
- Describe the purpose of Physical Layer encoding and how signaling enables bits to be transmitted across the local media
- Explain how data transfer rates are measured
- Identify components of network cabling distribution
- Identify cabling types, standards, and ports used for network connections
- Identify the characteristics of copper network media
- Describe common uses of copper network media
- Identify the characteristics of fiber network media
- Describe common uses of fiber network media
- Identify the characteristics of wireless network media
- Describe common uses of wireless network media
- Describe the components of a wireless local area network
- Compare wireless standards

NETWORK SECURITY

- Describe the requirements of a basic firewall to control specified network access
- Identify common security threats to computer networks
- Describe methods to mitigate security threats to computer networks
- Describe methods to control access to a network
- Explain methods of user authentication
- Describe various types of network security appliances and methods
- Explain the implementation of appropriate wireless network security measures

MOBILE APPLICATIONS

- Plan a basic network in accordance with requirements
- Explain the purpose of network design documentation
- Implement a basic network in accordance with a design

- Explain the purpose of configuration documentation
- Describe the use of network software tools to test and verify network operation
- Describe the use of appropriate network monitoring resources to analyze traffic
- Implement a consistent and logical network troubleshooting methodology
- Describe the use of appropriate hardware and software tools to troubleshoot network connectivity issues
- Explain how to troubleshoot common router, switch, and wireless network problems

Note: This program can be completed in 6 months. However, students will have online access to this program for a 24-month period.

MICROSOFT OFFICE Module

- Use an integrated software package, specifically the applications included in the Microsoft Office suite
- Demonstrate marketable skills for enhanced employment opportunities
- Describe proper computer techniques for designing and producing various types of documents
- Demonstrate the common commands & techniques used in Windows desktop
- List the meaning of basic PC acronyms like MHz, MB, KB, HD and RAM
- Use WordPad and MSWord to create various types of documents
- Create headings and titles with Word Art
- Create and format spreadsheets, including the use of mathematical formulas
- Demonstrate a working knowledge of computer database functions, including putting, processing, querying and outputting data
- Define computer terminology in definition matching quizzes
- Use the Windows Paint program to alter graphics
- Use a presentation application to create a presentation with both text and graphics
- Copy data from one MS Office application to another application in the suite
- Use e-mail and the Internet to send Word and Excel file attachments
- Demonstrate how to use the Windows Taskbar and Windows Tooltips
- Explain how copyright laws pertain to data and graphics posted on the Internet
- Take the college computer competency test after course completion
- Follow oral and written directions and complete assignments when working under time limitations

Note: Although the Microsoft Office Module is not required to successfully complete this program, students interested in pursuing free Microsoft MOS certification may want to consider completing this Microsoft Office Module at no additional cost.

System Requirements:

Windows Users:

- Windows 8, 7, XP or Vista
- 56K modem or higher
- Soundcard & Speakers
- Firefox, Chrome or Microsoft Internet Explorer

Mac OS User:

- Mac OS X or higher (in classic mode)
- 56K modem or higher
- Soundcard & Speakers
- Apple Safari

iPad Users:

- Due to Flash limitations, eLearning programs are NOT compatible with iPads

Screen Resolution:

- We recommend setting your screen resolution to 1024 x 768 pixels.

Browser Requirements:

- System will support the two latest releases of each browser. When using older versions of a browser, users risk running into problems with the course software.
- Windows Users: Mozilla Firefox, Google Chrome, Microsoft Internet Explorer
- Mac OS Users: Safari, Google Chrome, Mozilla Firefox

Suggested Plug-ins:

- Flash Player
- Real Player
- Adobe Reader
- Java