



## EXPERIENCED PROFESSIONAL CERTIFICATE IN **Network Administration**

### Certificate Description

This certificate provides professionals the opportunity to enhance technical and commercial understanding in Network Administration.

**Routing and Switching—ITNA 353**—This course provides an overview of routing and switching in network operations. Topics to be covered may include the role of switches and routers in network topologies and architectures, collisions and network congestion, the role of routers and switches in minimizing collisions, switching protocols and interswitch communications, switching and routing processes, switch operating systems, and switch management issues.

**Outcomes:**

- Implement Layer 2 network segmentation using switch configurations
- Explain the purpose of Layer 2 segmentation
- Explain the functions of bridges and switches
- Explain the purpose and function of the Spanning Tree Protocol
- Implement trunking between switches

**Network Hardware: Physical Layer—ITNA 354**—This course covers network hardware at Layer 1 of the OSI model. Topics covered may include wire cabling and cabling standards, wired layer 1 transmission methods, optical fiber cable, structured cabling systems, terminators and jacks, wireless layer 1 transmission methods, network cards and network interfaces.

**Outcomes:**

- List and explain hardware channel capacity standards
- Describe the bandwidth characteristics of several types of physical communication media
- Explain the benefits of structured cabling
- Identify and explain the use of the major types of wired and wireless terminators

**Special Topics in Network Administration—ITNA 359**—This course provides an advanced selection of contemporary topics which may include network management, operations and administration, developments in networking technologies, or developments in the business need for networking services.

**Outcomes:**

- Discuss how to identify and troubleshoot network problems
- Describe troubleshooting tools
- Monitor and optimize system performance and reliability
- Use implementation, management and maintenance skills in network configuration
- Differentiate between methods of connecting to a network
- Discuss emerging topics in network operation and administration



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**Wireless and Mobile Computing—ITNA 452**—This course surveys topics in wireless and mobile communications, including system architectures, physical challenges unique to wireless, carrier signal encoding, power control, location management, address management, multiple access technologies and protocols, and cellular and ad-hoc network topologies.

**Outcomes:**

- Discuss the fundamental differences between networks using waveguides and those using free space signaling
- Differentiate between fixed wireless, cellular, and ad-hoc networks
- Discuss prominent physical issues (ex. resource management, power control, fading, interference) in wireless networks
- Explain various MAC-sublayer protocols in multiuser wireless networks and the cross-layer protocol issues which may arise

**Data Storage and Compression—ITNA 454**—This course provides an in-depth discussion of technologies that are critical in handling massive volumes of data. Course topics may include error detection and correction, data encoding, lossless compression, media segmentation, distributed storage architecture, and future trends in storage handling.

**Outcomes:**

- Explain the motivations for archiving and implementation
- Describe the advantages and disadvantages of various data compression techniques
- Describe alternatives for distributed storage architecture
- Explain current and projected storage handling procedures
- Discuss the application of data storage techniques relative to business continuity

**Specialized Network Administration—ITNA 457**—This course covers the recent global Internet technology and paves the way for the new generation of networking. In this specialization course, students will explore architectural network designs in accordance with ISO standards, network topology requirements, configuration management, fault management, performance management, monitoring resources, Quality of Service (QoS), and security policies.

**Outcomes:**

- Explain network performance and resource management
- Describe network resource and control access
- Evaluate network and system configuration and troubleshoot problems
- Discuss access control for network resources, network throughput, utilization parameters and quality of service
- Evaluate a suitable security policy for implementation



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**Enterprise Networking—ITNA 455**—This course reviews the design and components of LAN and WAN systems. The implementation and deployment of network topologies using the necessary network hardware and software systems at the enterprise level will also be covered. Topics in this course may include network configurations, networking hardware, network operating systems, network management issues, and network communication.

**Outcomes:**

- Articulate data transmission and signal encoding techniques found in analog and digital communications
- Illustrate data link control protocols and multiplexing techniques
- Compare and Contrast wireless technologies used in LANs and WANs
- Explain methods for addressing major network management issues
- Differentiate between packet-switched and circuit-switched networks and protocols

**Implementing and Managing a Network—ITNA 459**—This course unifies a number of critical topics which may include network configuration, management, and monitoring through various tools, including network management protocols, and the impact of current developments on network implementation and management.

**Outcomes:**

- Explain the role of network management protocols in network administration
- Compare and contrast alternatives in network configuration
- Monitor and analyze a network through application of the appropriate tools, and explain the resulting output