

NETWORK ENGINEERING (NE)

NE 115 Computer and Networking Fundamentals

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

This course provides a technical overview of computers and computer networking used in business. Hands-on exercises are provided to give students experience with basic computer and network activities. The content serves as a technical foundation for later courses in the Network Engineering and Software Engineering programs.

NE 121 Windows Networking Essentials

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 115

Students are introduced to a desktop operating system. They perform the installation of the operating system as well as implementing and conducting the administration of resources, the implementation, management and troubleshooting of hardware devices and drivers, the monitoring and optimizing of system performance and reliability, and configuring and troubleshooting the desktop environment.

NE 131 Networking for Small Businesses

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 115

This course introduces students to basic concepts of networking. Students will apply the knowledge they learned in NE 121 and apply it to peer-to-peer networking using switches and routers. They will be introduced to the OSI model and TCP/IP.

NE 135 Networking and Linux Fundamentals

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

This course introduces students to networking hardware and concepts such as routing and switching as well as configuring machines on a network. Students will also be introduced to the Linux operating system through basic.

NE 241 Advanced Networking

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 135

Building off topics in NE 135 Networking & Linux Fundamentals, this course introduces students to Active Directory and advanced networking operations and designs.

NE 245 Introduction to Networks

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 131

This course continues with more in-depth discussion and labs dealing with the architecture, structure, functions, components, and models of the Internet and computer networks. The basic and advanced principles of IP addressing and fundamentals of Ethernet concepts, media, and operations are introduced to provide a foundation for the curriculum. By the end of the course, students will be able to build simple LANs, perform basic configurations for routers and switches, and implement IP addressing schemes.

NE 247 Windows Server

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 121

Students will learn to install, configure and operate a modern network server in both workgroup and domain configurations. They will learn to use the logical components of a domain to design simple forest structures. They will create appropriate user accounts and security groups to protect access to servers and to secure specific resources stored on servers. They will configure and troubleshoot critical infrastructure services as well as manage and configure storage use.

NE 249 Troubleshooting Fundamentals

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 115 and NE 121

This course provides students with theoretical and hands-on experience in preparation for the TestOut PC Pro and the most current CompTIA A+ certification exams. This course will cover how to evaluate, select, handle, install, and upgrade computer components in a safe manner. Students will also explore the nuances of the Windows client operating system and learn how to install, manage, and secure home and corporate OS environments.

NE 255 Linux Fundamentals

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 115

During this course, students will be introduced to the installation, configuration, and management of a Linux operating system. At the end of this course, students will be able to understand the basic functions of the Linux operating system including the role of the system administrator. The course will discuss such topics as running the Linux system, using the graphical user interface (GUI), the Linux command line system, the Linux shell and text files and basic administration tasks.

NE 257 Routing and Switching Essentials

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 245

Describes the architecture, components, and operations of routers and switches in a small network. Students learn how to configure a router and a switch for basic functionality. By the end of this course, students will be able to configure and troubleshoot routers and switches and resolve common issues with RIPv1, RIPv2, single-area and multi-area OSPF, virtual LANs, and inter-VLAN routing in both IPv4 and IPv6 networks.

NE 263 Introduction to Azure Administration

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 255

The course provides an important introduction to the Microsoft Azure Cloud Computing services which have grown to support IT infrastructure worldwide. Students will learn how to administer Azure virtual computing, storage, networking, security, web services and more. Successful completion of this course prepares students to take the AZ-900 Microsoft Azure Fundamentals certification.

NE 265 AS Capstone Project

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 247 and NE 257

This course features integration of the topics covered in the IT Networking Associate Degree Program. The course emphasizes teamwork in the design, construction, configuration and troubleshooting of a simple network infrastructure, to include network servers, workstations, routers and switches.

NE 371 Network Scripting

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 247

Through the use of practical exercises, students will learn how to configure, maintain and administer a Microsoft client/server network using a Windows PowerShell. Students will work with scripting using the command line and an integrated scripting environment.

NE 381 Design and Implementation of an Active Directory Network

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 247

Students will learn how to configure and manage a Microsoft Windows-based Active Directory network environment through an integrated system of skill-building lessons, hands-on exercises, and self-assessment tools.

NE 385 Linux System Administration

2 Class Hours, 4 Lab Hours, 4 Quarter Credit Hours

Students will learn the basics of Linux technology and be exposed to the maintenance of a Linux server that other users rely on for email, Web, database, networking, or other system services. In addition to the theoretical issues covered, students will gain much practical knowledge through the use of hands-on projects designed to reinforce those concepts.

NE 405 Mail Servers

3 Class Hours, 2 Lab Hours, 4 Quarter Credit Hours

Prerequisites: NE 381 and (NE 385 or NE 402)

In this course, students will develop skills in implementing and supporting current mail servers used in business. Students will explore techniques to fulfill the messaging and collaborative needs of a networked environment; working with the Windows, Linux OS to provide email services, instant messaging services, data conferencing services, and more. Students will also become familiar with most features of email settings and protocols (SMTP, POP, IMAP).

NE 406 Router Security and Firewall Management

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 257

This course introduces students to firewall management and basic router security. Topics include password protection, securing VTY connections, logging, SSH, firewall management using the ASA 5510 Adaptive Security Appliance.

NE 407 Virtualization

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 247

This course explores the use of virtualization. Concentration is on the implementation and maintenance of virtual machine infrastructures with emphasis on server-class virtual images. The differing virtualization techniques, such as full, OS, and paravirtualization will be examined. In addition, vendor offerings and open source options will be compared. The techniques used to move physical machines to the virtual domain will be evaluated and applied, as well as system security, patch management, backups, disaster recovery, and system runtime and response.

NE 411 Microsoft 365

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

With the migration to cloud computing in the business world, it is important to learn and understand the concepts and strategies employed in making data and services readily available. This course introduces cloud concepts, core services and concepts, as well as security and compliance in the Microsoft 365 environment.

NE 415 Scaling Networks

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 131 and NE 245 and NE 257

This course introduces students to the strategies associated with scaling networks. Students learn about the Hierarchical Network and the Cisco Enterprise Architectural Design models. The course explains how to manage the different implementations of Spanning Tree Protocol in a switched converged network and the concepts associated with EtherChannel technology. Students will learn how to configure a router for both EIGRP and OSPF routing protocols within a network topology, and students will develop the knowledge and skills necessary to implement a WLAN in a small-to-medium network.

NE 418 Network Analysis and Design

2 Class Hours, 2 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 406 and NE 415

Students will continue to develop and utilize critical thinking skills as they perform technical analysis of operational networks. The operational networks will include LAN, WAN and Firewall technologies from previous degree coursework. The course will also provide students with a team approach to learning. Students will participate in a team environment that will design, document, construct and troubleshoot a physical network topology from written needs assessment.

NE 425 Network Engineering Senior Project

6 Lab Hours, 3 Quarter Credit Hours

Prerequisites: NE 381 and NE 385 and NE 411

Students will configure, analyze, test and troubleshoot a complex, real-world heterogeneous physical network topology based upon a course scenario within a group setting. The heterogeneous network infrastructure will include Cisco devices and server technology, to include routers, switches, firewalls, Windows servers, mail servers, Linux servers, database servers and others. Students will be required to provide written progress reports, final course deliverables and presentations.