College: Nicolet College

Course Name: Network Fundamentals

Number: 10-150-110

**Course Competencies**

Competencies are what learners will be able to do as a result of the learning experience. In this course, the competencies that you must demonstrate are:

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| 1 | Explain the fundamental concepts associated with transport layer protocols and compare connectionless and connection-oriented transport methods |
| 2 | Explain the concepts associated with routing and describe the different protocols used to achieve router communication |
| 3 | Demonstrate the mechanics associated with IP addressing and IP sub netting |
| 4 | Explain the principles and practice of switching on an Ethernet network |
| 5 | Explain the physical, electrical, and mechanical properties and standards associated with each of the various transmission media used in computer networks |
| 6 | Contrast the various structures and technologies of computer networks |
| 7 | Demonstrate the ability to terminate common cables |
| 8 | Manage a wireless/wired router using appropriate configuration settings |
| 9 | Explain the components of a computer and how it functions on a network |

| **Week(s)/Session** | **Learning Plan/Description** | **Targeted Competencies** | **Learning Activities** | **Performance Assessment Tasks (PATS)** |
| --- | --- | --- | --- | --- |
| Week 1 | Intro and Syllabi |  | **Introduction and Syllabi** **Read Syllabus** - Online **Introduce yourself to the class** - Online |  |
| Week 2 | Computer components | Explain the components of a computer and how it functions on a network | **Intro Chapter** **Activity** **Activity**: Complete the Identify the Terms. - Online **Reading Assignment** Chapter 1: Personal Computer Hardware - Online  **Complete Lab** 1-1 : Determining Data Storage Capacity - Online **Complete Lab** 1-2 : Determining the Screen Resolution of a computer - Online | Labs |
| Week 3 | Computer components | Explain the components of a computer and how it functions on a network | **Reading Assignment:** Chapter 2 : Operating Systems **Complete lab** 2-2 : Evaluating an OS Upgrade - Online **Complete lab** 2-1 : Examining Operating Systems and Application - Online | Labs 2-2, 2-2 |
| Week 4 | Connecting to the Network | Explain the concepts associated with routing and describe the different protocols used to achieve router communication.  Explain the principles and practice of switching on an Ethernet network. | **Intro Chapter Activity** **Reading Assignment**: Chapter 3 : Connecting to the Network **Reading Assignment:** Chapter 6 pages 221-223 **Class Activity:** How an Email is sent through the Internet - Online **Complete lab** 3-1 : Building a Peer- to -Peer Network - In Class | Labs 3-1 |
| Week 5 | Connecting to the network | Explain the concepts associated with routing and describe the different protocols used to achieve router communication.  Explain the principles and practice of switching on an Ethernet network. | **Reading Assignment:** Chapter 3 : Connecting to the Network **Reading Assignment:** Chapter 6 pages 221-223 **Complete Lab** 3-2 : Determining the MAC Address of a Host - Online **Complete Lab** 3-3 : Determine the IP Address of a Computer - In Class **Complete Lab** 3-4 : IP Addresses and Network Communication - In Class **Complete Lab** 3-6 : Sharing Resources - In Class | Labs 3-2, 3-3, 3-4, 3-6, |
| Week 6 | Exam 1 - chapters 1-3 | Explain the concepts associated with routing and describe the different protocols used to achieve router communication.  Explain the principles and practice of switching on an Ethernet network.  Explain the components of a computer and how it functions on a network | **Complete Exam 1** | Exam 1 |
| Week 7 | The internet and ISP | Explain the physical, electrical, and mechanical properties and standards associated with each of the various transmission media used in computer networks.  Contrast the various structures and technologies of computer networks.  Demonstrate the ability to terminate common cables | **Intro Chapter Activity** **Reading Assignment:** Chapter 4 : Connecting to the Internet through as ISP **Class Activity**: Data Flow on the Internet - Online **Discussion Board** question for Lab 4-1 - **Complete Lab** 4-1 : Tracing Internet Connectivity - Online **Complete Lab** 4-2 : Building Strait-Through and Crossover UTP Cables - In Class **Complete Lab** 4-3 : Terminating UTP Cables - In Class **Complete Lab** 4-4 : Testing UTP Cables - In Class | Labs 4-1, 4-2, 4-3, 4-4 |
| Week 8 | Network Addressing | Demonstrate the mechanics associated with IP addressing and IP subnetting. | **Intro Chapter Activity** **Reading Assignment** Chapter 5 : Network Addressing **Reading Assignment** Article on IP Addressing - Online **Complete learning object** on ip addressing - Online **Complete Lab** 5-1 : Using the Windows Calculator with Network Addresses - Online | Lab 5-1 |
| Week 9 | Network Addressing | Demonstrate the mechanics associated with IP addressing and IP subnetting. | **Reading Assignment** Chapter 5 : Network Addressing **Reading Assignment** Article on IP Addressing - Online **Complete learning object** on ip addressing - Online **Complete handouts** on number system conversions **Complete handouts** ip addressing and subnet mask | Labs |
| Week 11 | Exam 2 - Chapter 4-6 | Explain the fundamental concepts associated with transport layer protocols and compare connectionless and connection-oriented transport methods.  Demonstrate the mechanics associated with IP addressing and IP subnetting.  Explain the physical, electrical, and mechanical properties and standards associated with each of the various transmission media used in computer networks.  Contrast the various structures and technologies of computer networks.  Demonstrate the ability to terminate common cables | Week 11 **Complete Exam 2** | Exam 2 - Chapter 4-6 |
| Week 12 | Wireless Technologies | Manage a wireless/wired router using appropriate configuration settings | **Intro Chapter Activity** **Reading Assignment** Chapter 7 : Wireless Technology **Complete Challenge Lab** 7-4 - Online **Intro Capstone Project** - Chapter 10 | Labs Final Project |
| Week 13 | Security | Explain the concepts associated with routing and describe the different protocols used to achieve router communication.  Contrast the various structures and technologies of computer networks. | **Intro Chapter Activity** **Reading Assignment** Chapter 8: Basic Security **Complete Lab** 8-2: Performing a Vulnerability Analysis - In Class **Discussion Board** question and response. Online : **Capstone Project** | Labs |
| Week 14 | Network Troubleshooting | Explain the concepts associated with routing and describe the different protocols used to achieve router communication.  Explain the principles and practice of switching on an Ethernet network.  Explain the physical, electrical, and mechanical properties and standards associated with each of the various transmission media used in computer networks. | **Intro Chapter Activity** **Reading Assignment** Chapter 9 : Troubleshooting Your Network **Discussion board** question and response - Online :  **Chapter 9 Tools assignment** | Labs |
| Week 15 | Capstone Project | Explain the fundamental concepts associated with transport layer protocols and compare connectionless and connection-oriented transport methods.  Explain the concepts associated with routing and describe the different protocols used to achieve router communication.  Demonstrate the mechanics associated with IP addressing and IP subnetting.  Explain the principles and practice of switching on an Ethernet network.  Explain the physical, electrical, and mechanical properties and standards associated with each of the various transmission media used in computer networks.  Contrast the various structures and technologies of computer networks.  Demonstrate the ability to terminate common cables  Manage a wireless/wired router using appropriate configuration settings  Explain the components of a computer and how it functions on a network | **Final Project** **Complete Capstone Project** - Chapter 10 | Final Project |
| Week 16 | Capstone Project | Explain the fundamental concepts associated with transport layer protocols and compare connectionless and connection-oriented transport methods.  Explain the concepts associated with routing and describe the different protocols used to achieve router communication.  Demonstrate the mechanics associated with IP addressing and IP subnetting.  Explain the principles and practice of switching on an Ethernet network.  Explain the physical, electrical, and mechanical properties and standards associated with each of the various transmission media used in computer networks.  Contrast the various structures and technologies of computer networks.  Demonstrate the ability to terminate common cables  Manage a wireless/wired router using appropriate configuration settings  Explain the components of a computer and how it functions on a network | **Present** **Capstone Project** to the class in detail **Capstone Project** - Chapter 10 | Final Project |