

<b>Course Prefix and Number:</b> IT 134
<b>Course Title:</b> Networking Fundamentals
<b>Recommended Transcript Title:</b> Networking Fundamentals
<b>Date Approved/Revised</b>
<b>Credit Hours:</b> 3 <b>Contact hours per week (Based on 15 week term):</b> <b>Lecture:</b> 3 <b>Lab:</b>
<b>Prerequisite:</b> CIS 114 <b>Corequisite:</b> <b>Pre/Corequisite:</b>
<b>Grading Mode:</b> Letter grade
<b>Catalog Description:</b> This course covers networking terminology, concepts, components and basic network design. It covers related topics such as Local Area Networks (LANs), Wide Area Networks (WANs), routing, cabling, IP addressing, TCP/IP Protocol, remote connectivity, user management, firewalls, and network troubleshooting. It includes the link between education and skills to industry needs for the entry level Information Technology graduates.
<b>Course Outcomes:</b> <b>Demonstrate Understanding of:</b>  <ol style="list-style-type: none"> <li>1. Demonstrate Understanding of Internet, intranet, extranet, LAN, WAN, wireless network, network structure and hardware, protocols and services and network administration.</li> <li>2. Explain how network operating system works</li> <li>3. Compare Windows NT, Unix, Red Hat Linux and Netware</li> <li>4. Discuss routing fundamentals, TCP/IP Transport and Application Layers</li> <li>5. Identify the components of a network including hardware and discuss network architecture</li> <li>6. Differentiate between network topologies</li> <li>7. Discuss how to manage users in a network</li> <li>8. Provide an overview of bandwidth requirement, availability requirement and security requirement for a network</li> <li>9. Provide an overview of network security</li> </ol>
<b>Implementation Cycle:</b> Spring
<b>Role in College Curriculum: (Check all that apply)</b> <input type="checkbox"/> <b>General Education Core (Specify category)</b> + <b>Technical Core:</b> Information Technology AAS <input type="checkbox"/> <b>Restricted Elective:</b> CAS in IT and CAS in Computer Applications Specialist

Course Number & Title: IT 134 Networking Fundamentals  
Date Prepared/Revised: April 6, 2015  
Date Course Approved by LOT: April 20, 2015

**+ General Elective**

**Workforce Education**

**Other (Please specify)**

**Course Fee: Yes**

**Instructor's Qualifications:** Bachelor's degree in information technology with two years of related work experience in IT field or master's degree with 18 graduate hours in IT.

**Expanded Course Description:** Emerging network technology will be discussed.

1. Understand the concepts of Internet, intranet, and extranet
  - Virtual Private Network (VPN), security zones, firewalls
2. Understand local area networks (LANs)
  - Perimeter networks; addressing; reserved address ranges for local use (including local loopback IP), VLANs; wired LAN and wireless LAN
3. Understand wide area networks (WANs)
  - Leased lines, dial-up, ISDN, VPN, T1, T3, E1, E3, DSL, cable, and more, and their characteristics (speed, availability)
4. Understand wireless networking
  - Types of wireless networking standards and their characteristics (802.11a,b,g,n, including different GHz ranges), types of network security (WPA, WEP, 802.1X, and others), point-to-point (P2P) wireless, wireless bridging
5. Understand network topologies and access methods
6. Understand switches
  - Transmission speed, number and type of ports, number of uplinks, speed of uplinks, managed or unmanaged switches, VLAN capabilities, Layer 2 and Layer 3 switches and security options, hardware redundancy, support, backplane speed, switching types and MAC table, understand capabilities of hubs versus switches
7. Understand routers
  - Transmission speed considerations, directly connected routes, static routing, dynamic routing (routing protocols), default routes; routing table and how it selects best route(s); routing table memory, network address translation (NAT), software routing in Windows Server
8. Understand media types
  - Cable types and their characteristics, including media segment length and speed; fiber optic; twisted pair shielded or nonshielded; catxx cabling, wireless; susceptibility to external interference (machinery and power cables); susceptibility to electricity (lightning), susceptibility to interception
9. Understand the Open Systems Interconnection (OSI) model
  - OSI model; Transmission Control Protocol (TCP) model; examples of devices, protocols, applications, and which OSI/TCP layer they belong to; TCP and User Datagram Protocol (UDP); well-known ports for most used purposes (not necessarily Internet); packets and frames

Course Number & Title: IT 134 Networking Fundamentals

Date Prepared/Revised: April 6, 2015

Date Course Approved by LOT: April 20, 2015

10. Understand IPv4
  - Subnetting, IPconfig, why use Internet Protocol version 4 (IPv4), addressing, ipv4toipv6 tunneling protocols to ensure backward compatibility, dual IP stack, subnetmask, gateway, ports, packets, reserved address ranges for local use (including local loopback IP)
11. Understand IPv6
  - Subnetting, IPconfig, why use IPv6, addressing, ipv4toipv6 tunneling protocols to ensure backward compatibility, dual IP stack, subnetmask, gateway, ports, packets, reserved address ranges for local use (including local loopback IP)
12. Understand names resolution
  - DNS, Windows Internet Name Service (WINS), steps in the name resolution process
13. Understand networking services
  - Dynamic Host Configuration Protocol (DHCP), remote access
14. Understand TCP/IP
  - Tools (such as ping), tracert, pathping, Telnet, IPconfig, netstat, reserved address ranges for local use (including local loopback IP), protocols
15. Identify and describe the functions of each of the seven layers of the OSI reference model.
16. Describe data link and network addresses and identify key differences between them.
17. Define and describe the function of a MAC address.
18. List the key internetworking functions of the OSI Network layer.
19. Identify at least three reasons why the industry uses a layered model.
20. Describe the two parts of network addressing, then identify the parts in specific protocol address examples.
21. Identify the functions of each layer of the ISO/OSI reference model.
22. Define and explain the five conversion steps of data encapsulation.
23. Describe the different classes of IP addresses [and subnetting].
24. Identify the functions of the TCP/IP network-layer protocols.

Prepared by: Vincenza Cumbo

April 6, 2015

---

Signature, Title

Date

Approved by:

Dean, Academic & Student Services

Date