DATE OF LAST REVIEW: 02/2013

CIP CODE: 11.0801

SEMESTER: Departmental Syllabus

COURSE TITLE: Local Area Networking

COURSE NUMBER: CIST-0117

CREDIT HOURS: 3

INSTRUCTOR: Departmental Syllabus

OFFICE LOCATION: Departmental Syllabus

OFFICE HOURS: Departmental Syllabus

TELEPHONE: Departmental Syllabus

EMAIL: Departmental Syllabus

KCKCC-issued email accounts are the official means for Electronically communicating with our students.

PREREQUISITE(S): Keyboarding Skills and Pre or Co-requisite of CIST-0101 Computer Concepts and Applications and knowledge of OS recommended.

REQUIRED TEXT AND MATERIALS:
Please check with the KCKCC bookstore, http://www.kckccbookstore.com/, for the required texts for your particular class.

SUPPLEMENTAL:
The primary text and assessment tools are on-line and require internet access.

COURSE DESCRIPTION:
The students in this course will be introduced to LAN (local area networks), MAT (metropolitan area networks) and WAN (wide area networks). The students will be study network topologies, network protocols, network hardware, and network software. Students will also perform experiments and troubleshoot common network failures.

METHOD OF INSTRUCTION:
A variety of instructional methods may be used depending on content area. These include but are not limited to: lecture, multimedia, cooperative/collaborative learning, labs and demonstrations, projects and presentations, speeches, debates, and panels, conferencing, performances, and learning experiences outside the classroom. Methodology will be selected to best meet student needs.

COURSE OUTLINE:
I. Introduction to Networks and Networking Concepts
   A. What is Networking?
   B. Networking Fundamentals
   C. Local and Wide Area Networks
1. Clients, Peers, and Servers
2. The Network Medium Carries Network Messages
3. Network Protocols
4. Network Software
5. Network Services

D. Network Types
   1. Peer to Peer Networking
   2. Server-based Networks
   3. Storage-area Networks (SANs)
   4. Hybrid Networks
   5. Server Hardware Requirements
   6. Specialized Servers

E. Selecting the Right Type of Network

II. Network Design Essentials
   A. Network Design
   B. Designing a Network Layout
   C. Standard Topology
      1. Bus
      2. Star Topology
      3. Ring Topology
   D. Hubs
      1. Active Hubs
      2. Passive Hubs
      3. Hybrid Hubs
   E. Switches
   F. Variations of the Major Topology
      1. Mesh Topology
      2. Star Bus Topology
      3. Interconnecting Multiple Virtual LANs
   G. Selecting a Topology
   H. Constructing a Network Layout

III. Networking Media
   A. Networking Cabling: Tangible Physical Media
   B. Primary Cable Types
      1. General Cabling Characteristic
      2. Baseband and Broadband Transmission
      3. The Importance of Bandwidth
      4. Coaxial Cable
      5. Twisted-pair Cable
      6. Fiber-optic Cable
      7. Cable Selection Criteria
      8. The IBM Cabling System
   C. Wireless Networking Intangible Media
      1. The Wireless World
      2. Types of Wireless Networks
      3. Wireless LAN Applications
      4. Wireless LAN Transmission
      5. Wireless Extended LAN Technologies
      6. Wireless Networking Technologies
      7. Microwave Networking Technologies
      8. High-speed Wireless Networking Technologies

IV. Network Interface Cards
   A. Network Interface Card (NIC) Basics
      1. From Parallel to Serial and Vice Versa
2. PC Buses
3. Other PC Interfaces Used for Networking
4. Principles of NIC Configuration
5. Making the Network Attachment

B. Choose Network Adapters for Best Performance
   1. Special-purpose NICs
   2. Wireless Adapters
   3. Remote Boot Adapters

C. Drive Software

V. Making Networks Work
   A. OSI and 802 Networking Models
      1. Role of a Reference Model
      2. OSI Network Reference Model
      3. IEEE 802 Networking Specifications

VI. Network Communications and Protocols
   A. Function of Packets in Network Communications
      1. Packet Structure
      2. Packet Creation
      3. Understanding Packets
   B. Protocols
   C. Putting Data on the Cable: Access Methods

VII. Network Architectures
   A. Ethernet
      1. Overview of Ethernet
      2. 10 Mbps IEEE Standards
      3. 100 Mbps IEEE Standards
      4. Gigabit Ethernet: 1 Gbps IEEE 802.3z Standards
      5. Segmentation
   B. Other Networking Alternatives
   C. Broadband Technologies
   D. Broadcast Technologies
   E. Asynchronous Transfer Mode (ATM)

VIII. Simple Network Operations
   A. Network Operating Systems
      1. Network Operating Systems Overview
      2. NOS Demands
   B. Software Components of Networking
      1. General NOS Components
      2. Server Network Software
      3. Client and Server
   C. Network Services
      1. Installing, Removing, and Configuring Network Services
      2. Network Bindings
      3. Network Printers
      4. Network Directory Shares
   D. Network Applications
      1. E-mail or Messaging
      2. Scheduling or Calendaring

IX. Understanding Complex Networks
   A. Interconnectivity in Multivendor Environments
   B. Implementing Multivendor Solutions
      1. Client-based Solutions
      2. Server-based Solutions
3. Vendor Options
  C. Centralized vs. Client/Server Computing
      1. Understanding Terminal Services
      2. Back to the Future: The Mainframe Environment
  D. Client/Server Model in a Database Environment
  E. Client/Server Architecture
  F. Advantages of Working in a Client/Server Environment

X. Network Administration Support
  A. Managing Networked Accounts
      1. Creating User Accounts
      2. Managing Group Accounts
      3. Disabling and Deleting User Accounts
      4. Renaming and Copying User Accounts
  B. Managing Network Performance
      1. Data Reads and Writes
      2. Queued Commands
      3. Collisions per Second
      4. Security Errors
      5. Server Sessions
      6. Network Performance
      7. Total System Management
      8. Maintaining a Network History
  C. Managing Network Data Security
      1. Planning for Network Security
      2. Security Models
      3. Implementing Security
      5. Maintaining Security
  D. Avoiding Data Loss
      1. Tape Backup
      2. Repairing or Recovering Windows Systems
      3. Uninterruptible Power Supply
      4. Fault-tolerant Systems

XI. Enterprise and Distributed Networks
  A. Modems in Network Communications
      1. Modem Speed
      2. Types of Modems
  B. Carries
  C. Remote Access Networking
      1. Serial Line Internet Protocols (SLIP)
      2. Point-to-Point Protocols (PPP)
  D. Creating Larger Networks
      1. Repeaters
      2. Bridges
      3. Routers
      4. Gateways
      5. Switches

XII. Wide Area and Large-scale Networks
  A. Wide Area Network Transmission Technologies
      1. Analog Connectivity
      2. Digital Connectivity
      3. Packet-switching Networks
  B. Advanced WAN Technologies
      1. X.25
2. ISDN (Integrated Services Digital Network)
3. Frame Relay
4. ATM (Asynchronous Transfer Mode)
5. FDDI (Fiber Distributed Data Interface)
6. Synchronous Optical Network (SONET)
7. Switched Multi-megabit Data Service (SMDS)

XIII. Solving Network Problems
   A. Preventing Problems with Network Management and Planning
      1. Backing Up Network Data
      2. Setting Security Policies
      3. Setting Hardware and Software Standards
      4. Establishing Upgrade Guidelines
      5. Maintaining Documentation
      6. Performing Pre-emptive Troubleshooting
      7. Using Network Monitoring Utilities
   B. Network Troubleshooting
      1. Troubleshooting Methodology
      2. Using Special Tools
      3. Network Support Resources
      4. Microsoft TechNet
      5. Microsoft Knowledge Base
      6. Linux Information Resources
      7. Online Support Services and Newsgroups
      8. Periodical
      9. Common Troubleshooting Situations
      10. Cabling and Related Components
      11. Power Fluctuations
      12. Upgrades
      13. Poor Network Performance

XIV. Understanding and Using Internet Resources
   A. What’s on the Internet?
      1. Chat and Instant Messaging
      2. E-mail
      3. File Transfer Protocols (FTP)
      4. Newsgroups
      5. Telnet
      6. World Wide Web
   B. Locating Internet Resources
      1. Internet Resources Names
      2. Domain Name Systems (DNS)
   C. Making an Internet Connection
      1. Dial-up Connections
      2. Digital Connections Types
      3. Connections Consideration

EXPECTED LEARNER OUTCOMES:
A. Upon completion of the course the student will be able to discuss the concept of local area networking.
B. Upon completion of the course the student will be able to understand the capabilities of LAN.
C. Upon completion of the course the student will be able to compare various LAN available in the market.
D. Upon completion of the course the student will be able to discuss the data rate, error detection and control strategies.
E. Upon completion of the course the student will be able to understand and Ethernet technology.
F. Upon completion of the course the student will be able to discuss the transmission media and technical factors related to transmission media.
G. Upon completion of the course the student will be able to identify different topologies and protocols.
H. Upon completion of the course the student will be able to troubleshoot the LAN network.

**COURSE COMPETENCIES:**

*Upon completion of the course the student will be able to discuss the concept of local area networking.*

1. Upon completion of the course the student will be able to define and explain basic LAN concept.
2. Upon completion of the course the student will be able to discuss the positive and negative characteristics of LAN Options.
3. Upon completion of the course the student will be able to identify bridges, routers, and gateways.
4. Upon completion of the course the student will be able to identify and select proper network hardware for application.
5. Upon completion of the course the student will be able to identify and select proper network software for application.
6. Upon completion of the course the student will be able to identify the five functional areas of LAN management.
7. Upon completion of the course the student will be able to design, construct and operate a PC peer-to-peer network.

*Upon completion of the course the student will be able to understand the capabilities of LAN.*

8. Upon completion of the course the student will be able to compare 10baseT to 100baseT.
9. Upon completion of the course the student will be able to configure and compare STP and UTP cables.
10. Upon completion of the course the student will be able to configure and operate a peer-to-peer network using Microsoft Windows O.S.

*Upon completion of the course the student will be able to compare various LAN available in the market.*

11. Upon completion of the course the student will be able to discuss Network Operating Systems.

*Upon completion of the course the student will be able to discuss the transmission media and technical factors related to transmission media.*

12. Upon completion of the course the student will be able to discuss wireless networking.
13. Upon completion of the course the student will be able to identify Microsoft LAN Manager and Windows characteristics.
14. Upon completion of the course the student will be able to discuss the future of networking.

*Upon completion of the course the student will be able to understand and Ethernet technology*

15. Upon completion of the course the student will be able to explain how to select the proper LAN for desired application.
16. Upon completion of the course the student will demonstrate or explain the installation of a NIC.

*Upon completion of the course the student will be able to identify different topologies and protocols.*

17. Upon completion of the course the student will demonstrate an understanding of MAC addresses.
18. Upon completion of the course the student will demonstrate an understanding of IP addresses.

*Upon completion of the course the student will be able to troubleshoot the LAN network.*

19. Upon completion of the course the student will demonstrate an understanding of Subnets.
20. Upon completion of the course the student will demonstrate an understanding of router configuration.
21. Upon completion of the course the student will demonstrate an understanding of network cabling.
22. The student will demonstrate an ability to meet I.T. deadlines.

**ASSESSMENT OF LEARNER OUTCOMES:**

Student progress is evaluated by means that include, but are not limited to, exams, written assignments, and class participation.
SPECIAL NOTES:
This syllabus is subject to change at the discretion of the instructor. Material included is intended to provide an outline of the course and rules that the instructor will adhere to in evaluating the student’s progress. However, this syllabus is not intended to be a legal contract. Questions regarding the syllabus are welcome any time.

Kansas City Kansas Community College is committed to an appreciation of diversity with respect for the differences among the diverse groups comprising our students, faculty, and staff that is free of bigotry and discrimination. Kansas City Kansas Community College is committed to providing a multicultural education and environment that reflects and respects diversity and that seeks to increase understanding.

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