

Washtenaw Community College Comprehensive Report

CST 225 PC Networking Effective Term: Spring/Summer 2014

Course Cover

Division: Business and Computer Technologies

Department: Computer Instruction

Discipline: Computer Systems Technology

Course Number: 225

Org Number: 13400

Full Course Title: PC Networking

Transcript Title: PC Networking

Is Consultation with other department(s) required: No

Publish in the Following: College Catalog , Time Schedule , Web Page

Reason for Submission: Three Year Review / Assessment Report

Change Information:

Consultation with all departments affected by this course is required.

Rationale: 3 year review

Proposed Start Semester: Winter 2014

Course Description: Students learn basic concepts associated with using PC's in a networked environment, including connecting to a network and connecting networks together. Included are peer-to-peer and client/server networks, network topologies and architectures, the OSI model, Ethernet and TCP/IP protocols, IPv4/IPv6 and MAC addressing, routers and routing, network printing, NAT and VPN's, plus wireless networking. The course also provides a strong foundation in preparation for the CompTIA Network+ Exam. This course contains material previously taught in ELE 216A and ELE 225A.

Course Credit Hours

Variable hours: No

Credits: 3

Lecture Hours: Instructor: 30 Student: 30

Lab: Instructor: 30 Student: 30

Clinical: Instructor: 0 Student: 0

Total Contact Hours: Instructor: 60 Student: 60

Repeatable for Credit: NO

Grading Methods: Letter Grades

Audit

Are lectures, labs, or clinicals offered as separate sections?: NO (same sections)

College-Level Reading and Writing

College-level Reading & Writing

College-Level Math

Requisites

Level II Prerequisite

CIS 100 minimum grade "C"

General Education

General Education Area 7 - Computer and Information Literacy

Assoc in Arts - Comp Lit

Request Course Transfer

Proposed For:

Student Learning Outcomes

1. Identify and differentiate the main types of networks and network operating systems, including peer-to-peer and client/server implementations.

Assessment 1

Assessment Tool: Departmental final exam

Assessment Date: Fall 2013

Assessment Cycle: Every Three Years

Course section(s)/other population: Cross-section of students in all sections of CST225 Note: likely will be the complete class, but will be representative of all skill levels.

Number students to be assessed: 10 – 40

How the assessment will be scored: The departmental exam will be a multiple choice exam made up by all instructors teaching the sections of CNT 225 – PC Networking. Questions/answers chosen for assessment will be chosen by the department as a whole from portions of the section tests given throughout the semester, and will be based on key concepts of the course objectives which make up each of the outcomes listed above. Tests will be blind-scored using a Scantron machine and results (right/wrong) for each question asked will be tabulated. A rubric will be used as a standard of the level of success in meeting those objectives.

Standard of success to be used for this assessment: A Rubric will be used here to measure the standard of success. The Rubric Course Success: Average of students should equal or exceed 70% correct answers for all questions used for assessment as a whole. Outcome Success: Average of all student scores for that outcome's part of the test is equal to or exceeds 70% Objective Success: Individual questions answered correctly by more than 50% of the class (looking at all the questions used for assessment) will be considered appropriate to the particular objective and therefore the outcome associated with that objective.

Who will score and analyze the data: Instructors in our department who are not directly associated with teaching the PC Networking course will be used to blind-score and tabulate the results. These will be reviewed with all instructors in our department, those directly teaching the courses, as well as those not teaching it. The above rubric will be used as the standard of measurement during the analysis period. However, the instructors teaching/developing the course will make necessary analysis/changes based on the results.

2. Distinguish among the various types of networking topologies, kinds of networking media and network hardware devices.

Assessment 1

Assessment Tool: Departmental final exam

Assessment Date: Fall 2013

Assessment Cycle: Every Three Years

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3. Identify various networking architectures, (including frame structure), and define the various levels of the OSI model, distinguishing between various protocols designed around it.

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4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and concepts behind IPv4 and IPv6 addressing.

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5. Define the various aspects of routing, network address translation, network printing, wireless networking and other applied networking concepts.

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Course Objectives

1. Identify the various types of networks; LAN, WAN, MAN, Enterprise, etc.

Matched Outcomes

1. Identify and differentiate the main types of networks and network operating systems, including peer-to-peer and client/server implementations.
2. Define the main purposes of networking, including sharing data, resources, etc.

Matched Outcomes

1. Identify and differentiate the main types of networks and network operating systems, including peer-to-peer and client/server implementations.
3. List the differences between peer-to-peer networking and client server networking.

Matched Outcomes

1. Identify and differentiate the main types of networks and network operating systems, including peer-to-peer and client/server implementations.
4. Identify Windows networking components representing the server function and the client function.

Matched Outcomes

1. Identify and differentiate the main types of networks and network operating systems, including peer-to-peer and client/server implementations.
5. Identify various networking devices including NICS, hubs, repeaters, switches, bridges, modems, wireless access points and routers and explain the operation of each, contrasting the differences between their functionality.

Matched Outcomes

2. Distinguish among the various types of networking topologies, kinds of networking media and network hardware devices.
6. Identify computer resources (IRQ's, DMA channel, etc.), NIC card uses, explain the parallel to serial function, buffering techniques, bus mastering, and other characteristics.

Matched Outcomes

2. Distinguish among the various types of networking topologies, kinds of networking media and network hardware devices.
7. Install, configure and test various network devices using modems, routers, switches, and hubs. Configure Windows networking properties, including network card installation and configuration.

Matched Outcomes

2. Distinguish among the various types of networking topologies, kinds of networking media and network hardware devices.
8. Identify the various wired topologies used in today's networks, including bus, star, extended star, ring, mesh, etc.

Matched Outcomes

2. Distinguish among the various types of networking topologies, kinds of networking media and network hardware devices.
9. Identify the primary types of media cabling used with LANs including UTP, fiber optic, atmosphere, etc. and define the limitations of each, including crosstalk, overall length, etc.

Matched Outcomes

2. Distinguish among the various types of networking topologies, kinds of networking media and network hardware devices.
10. Identify the seven layers of the OSI model, including the interfaces between the layers, and the virtual transmissions between layers on the sending and receiving machines.

Matched Outcomes

3. Identify various networking architectures, (including frame structure), and define the various levels of the OSI model, distinguishing between various protocols designed around it.
11. Identify the Ethernet networking architecture, including its access method, collision control, contention, encapsulation and limitations.

Matched Outcomes

3. Identify various networking architectures, (including frame structure), and define the various levels of the OSI model, distinguishing between various protocols designed around it.
12. Contrast the CSMACD and CSMACA access methods, and the importance of each in both wired and wireless networking.

Matched Outcomes

3. Identify various networking architectures, (including frame structure), and define the various levels of the OSI model, distinguishing between various protocols designed around it.
13. Contrast other types of networking architectures, including token passing, and the various types used with wireless, explaining the advantages/disadvantages of each.

Matched Outcomes

3. Identify various networking architectures, (including frame structure), and define the various levels of the OSI model, distinguishing between various protocols designed around it.
14. Identify the frame structure used with Ethernet, explaining the parts, headers, trailers, etc. and the function each of these parts have in the transmission process.

Matched Outcomes

3. Identify various networking architectures, (including frame structure), and define the various levels of the OSI model, distinguishing between various protocols designed around it.
15. Identify various networking protocols and explain the term, "protocol stack" and its relationship to the OSI model, using the TCP/IP protocol as an example.

Matched Outcomes

4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and concepts behind IPv4 and IPv6 addressing.
16. Define the key characteristics of IP addressing, both IPv4 and IPv6, the classes, the importance of the subnet mask and gateway, etc., the hierarchical structure, methods of representation (decimal/binary) and the methods used to increase the number of available addresses (such as subnetting).

Matched Outcomes

4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and concepts behind IPv4 and IPv6 addressing.
17. Identify a Windows "socket", its parts, and its importance in the session layer of the OSI model, and contrast the various protocol interfaces (NDIS, NetBIOS, TDI, etc.) and their function in making network protocols transparent to device drivers as well as applications.

Matched Outcomes

4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and concepts behind IPv4 and IPv6 addressing.
18. Differentiate and contrast the various protocols within TCP/IP, (DNS, DHCP, Telnet, ICMP, ARP, VPN, TCP, IP etc.), defining the functions and parts of each within the stack.

Matched Outcomes

4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and concepts behind IPv4 and IPv6 addressing.
19. Differentiate between frames, packets and segments, using encapsulation as the common thread.

Matched Outcomes

4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and concepts behind IPv4 and IPv6 addressing.
20. Install, configure and utilize frame/packet capture programs, and use them to look inside the frame, to identify the various parts in real time.

Matched Outcomes

4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and concepts behind IPv4 and IPv6 addressing.
21. Identify the configurations used with TCP/IP networks, including the use of non-subnetted and subnetted IP addresses, TCP/IP troubleshooting tools, and network packet software for

observing the various characteristics of each TCP/IP protocol.

Matched Outcomes

- 5. Define the various aspects of routing, network address translation, network printing, wireless networking and other applied networking concepts.
- 22. Distinguish between the types of wireless networks and differentiate between their various speeds, distances, and applicability to different business situations.

Matched Outcomes

- 5. Define the various aspects of routing, network address translation, network printing, wireless networking and other applied networking concepts.
- 23. Install, configure, and test a number of different types of networks, including:
 - a simple LAN with hubs;
 - WAN/LAN networks, (including a three subnet/two router network with workstations at both ends), also with hubs/switches;
 - a 2nd WAN/LAN network, including a dial-up server, a client workstation, a telephone switch and internal/external modems;
 - a 3rd WAN/LAN network using a combination of wired and wireless machines with a router.

Matched Outcomes

- 5. Define the various aspects of routing, network address translation, network printing, wireless networking and other applied networking concepts.
- 24. Define the types of network printing, showing proficiency in projects involving configuration of the different types for both local printing and network printing using a print server.

Matched Outcomes

- 5. Define the various aspects of routing, network address translation, network printing, wireless networking and other applied networking concepts.
- 25. Identify various VPN configurations and configure client connections to VPN servers, differentiating the multiple connections created when using this type of encrypted transmission.

Matched Outcomes

- 5. Define the various aspects of routing, network address translation, network printing, wireless networking and other applied networking concepts.

New Resources for Course

Course Textbooks/Resources

Textbooks

unknown. *Networking Essentials* , Fifth Edition ed. Course Technology, 0

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Computer workstations/lab

Data projector/computer

Reviewer

Action

Date

Faculty Preparer:

William Reichert

Faculty Preparer

Sep 17, 2013

Department Chair/Area Director:

John Trame

Recommend Approval

Sep 18, 2013

Dean:

Rosemary Wilson

Recommend Approval

Oct 23, 2013

Vice President for Instruction:

Bill Abernethy

Approve

Nov 13, 2013