Washtenaw Community College Comprehensive Report

CST 185 Local and Mobile Networking Essentials
Effective Term: Fall 2019

Course Cover
Division: Business and Computer Technologies
Department: Computer Instruction
Discipline: Computer Systems Technology
Course Number: 185
Org Number: 13400
Full Course Title: Local and Mobile Networking Essentials
Transcript Title: Local/Mobile Network Essential
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:
　　Course discipline code & number
　　Course title
　　Course description
　　Outcomes/Assessment
　　Objectives/Evaluation
　　Other:
Rationale: 1. Course Number - This is considered the first course to be taken in networking, and therefore should be a "100" level course - it is a lead-in to the more advanced Cisco and Microsoft courses that are "200" Level courses. 2. Course Credit Hours - Credit Hours should match Contact Hours which are four contact hours per week. 3. Course Title - The networking concepts covered now are far more inclusive than just with the "PC" and therefore the title should be changed to reflect networking as a whole. 4. Modification of Outcome Requirements - the addition of Serial, Bluetooth, NFC, and DSRC communication altered a number of the Outcomes due to basically a total course rearrangement. 5. Objective Modification- because of the additional material added for Serial, Bluetooth, NFC, and DSRC, considerable rearrangement of the course (and therefore the Objectives) was necessary. This including combining Peer to Peer Communication and Client Server, combining Topology and Media, combining Ethernet Architecture and Ethernet Protocol, combining Packet Software labs using TCP/IP Protocols, and combining TCP/IP Applications lab projects. 6. Course Description - This was also changed as noted above, bringing in the new additional protocols.
Proposed Start Semester: Winter 2019
Course Description: Students learn basic networking concepts including building networks, connecting to a network and connecting networks. Included are peer-to-peer, client/server relationships, network topologies, media, architectures, the OSI model, Ethernet and TCP/IP protocols, IPv4/IPv6 and MAC addressing, routers/routing, network printing, NAT, VPN's, wireless, serial communication, Bluetooth, NFC, and DSRC. The course also provides a strong foundation in preparation for the CompTIA Network+ Exam. This course was previously CST 225.

Course Credit Hours
Variable hours: No
Credits: 4
Lecture Hours: Instructor: 60 **Student:** 60
Lab: Instructor: 0 **Student:** 0
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
No Level Required

Requisites
Level II Prerequisite
Basic computer skills with the Windows Operating System would be extremely helpful or completion of CIS 100.

General Education
General Education Area 7 - Computer and Information Literacy
Assoc in Arts - Comp Lit
Assoc in Applied Sci - Comp Lit
Assoc in Science - Comp Lit

Request Course Transfer
Proposed For:
Eastern Michigan University

Student Learning Outcomes

1. Distinguish and differentiate the main types of networks and network architecture by defining the layers of the OSI Model and identifying various types of point-to-point networking devices including network interface cards and switches.
   Assessment 1
   Assessment Tool: Written Exam specifically created for the assessment
   Assessment Date: Fall 2021
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Rubric: A written test will be given which will be a multiple choice exam with Questions/answers chosen from portions of the section tests given throughout the semester. The exam 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 Outcomes and objectives that are listed in the syllabus. The test will be divided into sections, each identified with an outcome, and the questions in each section will address the objectives
   Standard of success to be used for this assessment: Rubric Used: 1. Average of all students taking the test should equal or exceed 70% correct answers for all questions used in the assessment test. 2. 70% or greater of the number of students taking the assessment test should equal or exceed that 70% mark for all the question used in the assessment test. 3. Outcome Success: Average of all student scores for each particular outcome's part of the test should equal or exceed 70%.

Who will score and analyze the data: Instructors teaching the Networking course will blind-score the test and tabulate the results. These will be reviewed and matched with the above rubric and will be used as the standard of measurement during the analysis period. The instructors teaching/developing the course will make necessary analysis and changes based on the results.

2. Distinguish among the various types of networking topologies, various kinds of networking media and identify point-to-point networking architectures, protocols, and frame structure.
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   Assessment Tool: Written Exam specifically created for the assessment
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   Assessment Cycle: Every Three Years
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3. Identify the characteristics of both peer-to-peer and client server networking and distinguish the characteristics of a Microsoft Active Directory environment.
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   Number students to be assessed: All students
   How the assessment will be scored: Rubric: A written test will be given which will be a multiple choice exam with Questions/answers chosen from portions of the section tests given throughout the semester. The exam 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 Outcomes and objectives that are listed in the syllabus. The test will be divided into sections, each identified with an outcome, and the questions in each section will address the objectives
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Success: Average of all student scores for each particular outcome's part of the test should equal or exceed 70%.
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4. Identify and distinguish between the parts of the TCP/IP protocol stack, including various applications and define the concepts behind IPv4 and IPv6 addressing including routing, routers, network address translation and network printing.

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   Course section(s)/other population: All sections
   Number students to be assessed: All students
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5. Define the various aspects of wireless networking including the equipment and the protocols distinguishing the speed progressions, and identify other wireless technologies including Bluetooth, Near Field Communication, and Dedicated Short Range Communication.

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   Assessment Date: Fall 2021
   Assessment Cycle: Every Three Years
   Course section(s)/other population: All sections
   Number students to be assessed: All students
   How the assessment will be scored: Rubric: A written test will be given which will be a multiple choice exam with Questions/answers chosen from portions of the section tests given throughout the semester. The exam 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 Outcomes and objectives that are listed in the syllabus. The test will be divided into sections, each identified with an outcome, and the questions in each section will address the objectives

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Course Objectives

1. Identify the various types of networks; LAN, WAN, MAN, Enterprise, etc.
2. Define the main purposes of networking, including sharing data, resources, etc.
3. List the differences between peer-to-peer networking and client server networking.
4. Identify Windows networking components representing the server function and the client function.
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.
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.
7. Install, configure and test various network devices using modems, routers, switches, and hubs. Configure Windows networking properties, including network card installation and configuration.
8. Identify the various wired topologies used in today's networks, including bus, start, extended star, ring, mesh, etc.
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.
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.
11. Identify the Ethernet networking architecture, including its access method, collision control, contention, encapsulation and limitations.
12. Contrast the CSMACD and CSMACA access methods, and the importance of each in both wired and wireless networking.
13. Contrast other types of networking architectures, including token passing, and the various types used with wireless, explaining the advantages/disadvantages of each.
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.
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.
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).
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.
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.
19. Differentiate between frames, packets and segments, using encapsulation as the common thread.
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.
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.

22. Distinguish between the types of wireless networks and differentiate between their various speeds, distances, and applicability to different business situations.
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, and null-modem serial connections with a terminal program; • a 3rd WAN/LAN network using a combination of wired and wireless machines with a router.
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.
25. Identify various VPN configurations and configure client connections to VPN servers, differentiating the multiple connections created when using this type of encrypted transmission.
26. Identify the characteristics of alternate wireless connectivity protocols, including Bluetooth, Near Field Communication, and Dedicated short Range Communication, including operating characteristics as well as inner communication compatibility with other networking devices.

New Resources for Course

Course Textbooks/Resources

Textbooks

Meyers, Michael. *CompTIA Network +*, Seventh Edition ed. Chicago: McGraw Hill, 2018, ISBN: 1260122387.

Manuals

Periodicals

Software

Equipment/Facilities

Level III classroom

Computer workstations/lab

Data projector/computer

Reviewer	Action	Date
Faculty Preparer:		
William Reichert	*Faculty Preparer*	*Aug 28, 2018*
Department Chair/Area Director:		
Philip Geyer	*Recommend Approval*	*Sep 12, 2018*
Dean:		
Eva Samulski	*Recommend Approval*	*Sep 13, 2018*
Curriculum Committee Chair:		
Lisa Veasey	*Recommend Approval*	*Oct 11, 2018*
Assessment Committee Chair:		
Shawn Deron	*Recommend Approval*	*Oct 11, 2018*
Vice President for Instruction:		
Kimberly Hurns	*Approve*	*Oct 12, 2018*