PELLISSIPPI STATE TECHNICAL COMMUNITY COLLEGE  
MASTER SYLLABUS  

NETWORKING & PC COMMUNICATIONS  
CST 2455  

Class Hours: 3.0  Credit Hours: 4.0  
Laboratory Hours: 3.0  Date Revised: Spring 02  

Catalog Course Description:  

A hands-on study of microcomputer communication applications and networking products. Lab activities include installation, file server setup, printer drivers, cabling, topologies, security, messaging, management and control. Applications software and user/client scripts will be developed and installed.  

Entry Level Standards:  

The entering student should be skilled with the DOS and Windows 95/98 operating systems and be able to demonstrate general computer knowledge. Problem solving and analytical skills are also important.  

Prerequisite:  

CST 1110 or department approval  

Textbook(s) and Other Reference Materials Basic to the Course:  

Required Materials:  

3 1/2" HD Diskettes  
3-Ring Notebook w/pocket  

Suggested Optional Supplementals:  

NetWare 3.11/12:Network Administrator, Ted Simpson, Course Technology  
Windows NT Workstation 4, Dennis Maione, New Riders Press, 1998  
Using Novell Netware, Que Books  
Mastering Novell NetWare Sybex Books  
Communications Networking, Jordan and Churchill, Brady Books  
The Business Guide to Local Area Networks, Stallings, Howard Sams and Company  
Local Computer Network Technologies, Tropper, Academic Press  
Understanding Data Communications and Networks, Shay, Brooks/Cole Publishing  
Introduction to Networking, Que Publishing  
Outside reading, magazines, the Internet, vendor materials  

I. Week/Unit/Topic Basis:  

Week  Topic
Introduction, Topic Overview, Schedule, DOS review; Introduction to Communications

Fundamentals of Data Communications

Communications Media

Data Communication Terminal Equipment

Data Communication Equipment; Exam 1

Exam Review; Data Transmission Concepts

Data Communication Protocols

Networks

Wide Area Networks (WANs)

Internet Concepts; Exam 2

Local Area Networks (LANs)

Distributed Networks and Systems

Network Management/Network Software

Major Project Presentations

Continued; Exam 3

Final Exam Period

II. Course Objectives*:

A. Demonstrate efficient use of operating system commands and LAN commands. IV

B. Demonstrate efficient use of the PC microcomputer, software and attached peripherals as a local area network workstation. II,IV

C. Demonstrate knowledge of networking, communications, and transmission concepts. III,IV

D. Demonstrate knowledge of the hardware used for data communications and transmission. III,IV

E. Demonstrate knowledge of topologies, protocols, terminology and architectures associated with Local Area Networks and Wide Area Networks. III,IV

F. Demonstrate a working knowledge of each of the various networks covered in this course and associated utilities, standards, set-ups and features. II,IV,VIII

G. Identify client needs, connection problems, security problems and cable routing problems. Also plan, design, and specify all components of a fully functional network which meets client needs. II,III,IV,VII

H. Demonstrate knowledge of software used for data communications and transmission. III,IV
I. Demonstrate client service, teamwork skills and good communications skills to resolve problems and complete tasks. I,II,IX

*Roman numerals after course objectives reference goals of the CST program.

III. Instructional Processes*

Students will:

1. Use operating systems commands and utilities to perform practical tasks for personal computing. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Transitional Strategy

2. Solve problems encountered in the subjects of networking, electronic communications, and associated subjects. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome


4. Handle and examine modern computing devices. Technological Literacy Outcome

5. Prepare documents and presentations for management explaining computer networks and communications hardware/software, etc. to meet user requirements. Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Transitional Strategy, Active Learning Strategy

6. Practice elements of the work ethic such as punctuality, professionalism, dependability, cooperation, and contribution. Personal Development Outcome

*Strategies and outcomes listed after instructional processes reference Pellissippi State’s goals for strengthening general education knowledge and skills, connecting coursework to experiences beyond the classroom, and encouraging students to take active and responsible roles in the educational process.

IV. Expectations for Student Performance*

Upon successful completion of this course, the student should be able to:

1. Boot, move, select drives and sub-directories, copy, format, print, create backups, rename files, delete files and use utilities available in the operating system. A,B

2. Perform activities to install, set-up and check various software products. A,B,C

3. Demonstrate effective use of LAN OS products and specific utilities associated with that product. A,B,H

4. Demonstrate knowledge of terminology and commands associated with the microcomputer, disk operating system, topologies, peripheral devices, servers, workstations, networks, and connection of the PC to all associated equipment. A,B,C,D,E,F,G,H

5. Define and differentiate data communications and telecommunications. C

6. List/describe the components of a communication system. C,D

7. List the standards-setting organizations involved in the communication industry. C,D,H

8. Define and differentiate bit rates and baud rates. C
9. Define/describe selected data codes used in communications. C
10. Define/describe the voice communication network. C,D
11. Describe the purpose of a modem. D
12. Define/explain frequency and bandwidth for data communications. C
13. Define/differentiate digital and analog signals. C
14. Explain the operation of the public telephone network. C,D,H
15. Describe the difference(s) between a dialed and dedicated circuit. C,D,E
16. Define/define explain bounded, unbounded, conducted, and radiated media. C,D
17. Define/describe and explain the operation, advantages/disadvantages, costs, etc. of twisted pair, coaxial cable, and fiber optic media. D
18. Describe how these different types of cables are used in communications and networks. D,E
19. Define/describe the radiated media and the systems using this media for transmission. D,E
20. Describe the role(s) of various types of computers in a communications network. D,E,F
21. Explain the differences among dumb, smart, intelligent, and programmable terminals. D
22. List and explain the uses for special-purpose terminals. D
23. Describe how terminals are connected in a network configuration. D,E,F
24. Define/describe/explain common terminal interface concepts and standards. C,D
25. Define/describe frequency division multiplexing, time division multiplexing, and statistical time division multiplexing. C,D,E,F
26. Define/describe controllers, front-end processors, and concentrators. D
27. Explain how front-end processors are used in a data communications network. D
28. Define/describe protocol conversion and why it is needed in data communication networks. C,F,
29. List equipment needed to monitor a network and ensure it is working properly. D,F,H
30. Define/describe a computer port and how data can be directed to different ports. D
31. Define/describe modulation, amplitude modulation, frequency modulation, and phase modulation and distinguish between these types. C
32. Define/describe/explain simplex, half-duplex, and full-duplex data transmission. C
33. Define/describe/explain digital transmission. C
34. Define/describe/explain how errors are detected, corrected, and prevented on a data communication network. C,H
35. Define/describe/explain synchronous and asynchronous transmissions.  C
36. Define/describe/explain serial and parallel transmission.  C
37. Define/describe the role of software in a data communication network.  C,H
38. Define/describe a protocol and how it is used in a network.  C,E,H
39. Define/describe/explain the Open Systems Interconnection (OSI) model.  C,E,F
40. List the various classifications of protocols.  C,E,H
41. Define/describe/explain mainframe and personal computer protocols.  C,E,F
42. Define/describe/explain the differences among bit-oriented, character-oriented, and byte-count-oriented protocols.  C,E,F
43. Define/describe the terms used when describing a computer network.  C,E
44. Define/describe/explain the differences among circuit-switching, message-switching, and packet-switching networks.  C,E,F
45. Define/describe/explain the types of routing techniques used to move data through a network.  C,F,H
46. Define/describe what is meant by the term "topology."  C
47. List and describe the various topologies used in networks.  C,E
48. Define/describe/explain the differences between a public and private network.  C
49. Differentiate and explain the concepts of a LAN and a WAN.  C,D,E
50. Describe the function of the Internet and intranets.  C,F,H
51. Define/describe the topologies used in wide area networks.  C,E
52. Define/describe/explain the use of IBM's System Network Architecture (SNA) and how it relates to today's communication environments.  C,E
53. Define/describe/explain System Application Architecture (SAA) and how it is used in a WAN.  C,E
54. Define/describe/explain the use of Digital Network Architecture (DNA).  C,E
55. Define/describe/explain the differences among the layered architectures of DNA, SAA, DNA, and the OSI model.  C,E
56. Define/describe/explain how electronic data interchange (EDI) uses wide area networks.  F
57. Describe a brief history and the design and makeup of the Internet.  C,F
58. Define/describe/explain Internet addressing schemes.  C,E
59. Define/describe/explain the purpose of Gopher.  E
60. Define/describe/explain the differences between Archie and Veronica.  E
61. Define/describe/explain the World Wide Web (WWW).  E
62. Describe the hardware/software used in a local area network (LAN).  C,E,F,H
63. List/describe the topologies used in LANs.  C,E,F
64. Define/describe/explain/specify the differences among CSMA/CD, token ring, token bus, ARCNET, and AppleTalk.  C,D,E
65. Define/describe peer-to-peer and server based networks and show how they are different.  C,D,E
66. Differentiate between various network operating systems (NOS).  H
67. Define/describe/explain "repeater", "bridge", "router", "brouter", and "gateway" in the context of LANs.  C,D
68. Define/describe the characteristics that distinguish a distributed network from other types of networks.  C,D
69. Define/describe/list the types of distributed processing.  C,D
70. Differentiate between hierarchal and horizontal distributer networks.  C,D
71. Describe the types of files used in distributed systems.  C
72. Explain/illustrate the part a database plays in a distributed system.  C,H
73. Define/describe/list explain the objectives of network management.  F
74. Define/describe the characteristics of the network that affect user satisfaction.  F,G,I
75. Define/describe cost-effective techniques that can be used in network management.  F,G
76. Define/describe types of network security.  C,D,H
77. Define/describe the differences between worms and viruses on a network.  C
78. Describe how network management objectives are met.  E,F,G
79. Define/describe the types of computer software used in a data communication network.  H
80. Define/describe various data communication access methods (BTAM, TCAM, VTAM,NCP).  C,H
81. List the software functions that affect a network.  H
82. Describe file transfer software . H
83. Define/describe Ateletext®, Avideotext®, and mail software, and show how they are used in a network.  H
84. Demonstrate client service, teamwork skills and good communications skills to resolve problems and complete tasks.  I

*Letters after performance expectations reference the course objectives listed above.
V. Evaluation:

A. Testing Procedures:

Three examinations each worth 200 points will be given. Each will be cumulative. Hands-on learning activities done individually and in teams will also serve as the basis for course evaluation. Assessments worth 400 points will consist of special projects, research papers, team activities, essays, short answer documents, tests, or other work assigned.

B. Laboratory Expectations:

Laboratory exercises are included in the above assessment activities.

C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

<table>
<thead>
<tr>
<th>Points Range</th>
<th>Grade</th>
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<tbody>
<tr>
<td>920 - 1000 points</td>
<td>A</td>
</tr>
<tr>
<td>820 - 919 points</td>
<td>B</td>
</tr>
<tr>
<td>700 - 819 points</td>
<td>C</td>
</tr>
<tr>
<td>650 - 699 points</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 650 points</td>
<td>F</td>
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</tbody>
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VI. Policies:

Attendance Policy:

This course uses software and hardware not normally available out-of-class to students. Regular attendance is required for success in this class. Pellissippi State Technical Community College expects students to attend all scheduled instructional activities. As a minimum, students in all courses must be present for at least 75 percent of their scheduled class and laboratory meetings in order to receive credit for the course.