Class Hours: 3.0                  Credit Hours: 4.0
Laboratory Hours: 3.0              Date Revised: Fall 00

NOTE: This course is not intended for transfer credit.

Catalog Course Description:

This course is designed for information systems personnel who install, support, and manage computer networks. Topics covered in this course include network designs, architectures, standards, and protocols. This course is designed for students who plan to take the CompTIA Network+ Exam and/or the Microsoft Networking Essentials Certification Exam.

Entry Level Standards:

The student MUST be familiar with the architecture and operations of standard PCs (personal computers). The student must be able to use Microsoft Windows to run application programs, create directories and to copy, move, rename, and delete directories and files. The student must have math, writing, verbal and English language skills at the college entry level.

Prerequisites:

None

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


I. Week/Unit/Topic Basis:

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to Networks and Networking Competencies; Network Design Essentials</td>
</tr>
<tr>
<td>1-2</td>
<td>Networking Media; Network Interface Cards</td>
</tr>
<tr>
<td>3-4</td>
<td>OSI and 802 Networking Models</td>
</tr>
<tr>
<td>4-5</td>
<td>Network Communications and Protocols</td>
</tr>
<tr>
<td>5</td>
<td>Network Architectures; Exam 1</td>
</tr>
<tr>
<td>5-6</td>
<td>Network Operations</td>
</tr>
<tr>
<td>6</td>
<td>Complex Networks</td>
</tr>
</tbody>
</table>
Network Administration and Support
Enterprise and Distributed Networks
Wide Area and large-Scale Networks
Solving Network Problems; Exam 2
Understanding and Using Internet Resources
Planning and Implementing Networks; Exam 3; Major Group Project Presentation
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 Business and Computer Technology department.

III. Instructional Processes*:

Students will:

1. Use Windows 95/98 and DOS 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, Active Learning Strategy
2. Demonstrate knowledge of networking, electronic communication, and associated subjects. Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Transitional Strategy, Active Learning Strategy
3. 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, Transitional Strategy, Active Learning Strategy


5. Handle and examine modern computing devices. Technological Literacy Outcome, Transitional Strategy

6. Prepare documents for management explaining PC system problems and the need for new systems, upgrades, networks, etc. Communication Outcome, Problem Solving and Decision Making Outcome, Technological Literacy Outcome, Information Literacy Outcome, Transitional Strategy, Active Learning Strategy

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

3. 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

4. Define and differentiate data communications and telecommunications. C.

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

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

7. Define and differentiate bit rates and baud rates. C

8. Define/describe selected data codes used in communications. C

9. Describe the purpose of a modem. D

10. Define/explain frequency and bandwidth for data communications. C

11. Define/differentiate digital and analog signals. C

12. Describe/define explain bounded, unbounded, conducted, and radiated media. C,D

13. Define/describe and explain the operation, advantages/disadvantages, costs, etc. of twisted
pair, coaxial cable, and fiber optic media. D

14. Describe how these different types of cables are used in communications and networks. D,E

15. Define/describe the radiated media and the systems using this media for transmission. D,E

16. Describe the role(s) of various types of computers in a communications network. D,E,F

17. Define/describe/explain common terminal interface concepts and standards. C,D

18. Define/describe frequency division multiplexing, time division multiplexing, and statistical time division multiplexing. C,D,E,F

19. Define/describe protocol conversion and why it is needed in data communication networks. C,F,H

20. List equipment needed to monitor a network and ensure it is working properly. D,F,H

21. Define/describe a computer port and how data can be directed to different ports. D

22. Define/describe modulation, amplitude modulation, frequency modulation, and phase modulation and distinguish between these types. C

23. Define/describe/explain simplex, half-duplex, and full-duplex data transmission. C

24. Define/describe/explain digital transmission. C

25. Define/describe/explain how errors are detected, corrected, and prevented on a data communication network. C,H

26. Define/describe/explain synchronous and asynchronous transmissions. C

27. Define/describe/explain serial and parallel transmission. C

28. Define/describe the role of software in a data communication network. C,H

29. Define/describe a protocol and how it is used in a network. C,E,H

30. Define/describe/explain the Open Systems Interconnection (OSI) model. C,E,F

31. List the various classifications of protocols. C,E,H

32. Define/describe/explain mainframe and personal computer protocols. C,E,F

33. Define/describe/explain the differences among bit-oriented, character-oriented, and byte-count-oriented protocols. C,E,F

34. Define/describe the terms used when describing a computer network. C,E

35. Define/describe/explain the differences among circuit-switching, message-switching, and packet-switching networks. C,E,F

36. Define/describe/explain the types of routing techniques used to move data through a network. C,F,H

37. Define/describe what is meant by the term "topology." C
38. List and describe the various topologies used in networks.  C,E
39. Define/describe/explain the differences between a public and private network.  C
40. Differentiate and explain the concepts of a LAN and a WAN.  C,D,E
41. Describe the function of the Internet and intranets.  C,F,H
42. Define/describe/explain the differences among the layered architectures of DNA, SAA, DNA, and the OSI model.  C,E
43. Define/describe/explain Internet addressing schemes.  C,E
44. Describe the hardware/software used in a local area network (LAN).  C,E,F,H
45. List/describe the topologies used in LANs.  C,E,F
46. Define/describe/explain/specify the differences among CSMA/CD, token ring, token bus, ARCNET, and AppleTalk.  C,D,E
47. Define/describe peer-to-peer and server based networks and show how they are different.  C,D,E
48. Differentiate between various network operating systems (NOS).  H
49. Define/describe/explain "repeater", "bridge", "router", "brouter", and "gateway" in the context of LANs.  C,D
50. Define/describe the characteristics that distinguish a distributed network from other types of networks.  C,D
51. Define/describe/list explain the objectives of network management.  F
52. Define/describe the characteristics of the network that affect user satisfaction.  F,G,I
53. Define/describe cost-effective techniques that can be used in network management.  F,G
54. Define/describe types of network security.  C,D,H
55. Define/describe the differences between worms and viruses on a network.  C
56. Describe how network management objectives are met.  E,F,G
57. Define/describe the types of computer software used in a data communication network.  H
58. Describe file transfer software.  H
59. 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:

There will be three tests which count 300 points each (or 900 points total). There will be no
make-up tests unless prior arrangements are made with the instructor.

B. Laboratory Expectations:

Lab attendance is required. Assignments worth 100 points must be completed and submitted by the assigned deadline. This is a coordinated laboratory class, and assignments must be completed as scheduled.

C. Field Work:

N/A

D. Other Evaluation Methods:

N/A

E. Grading Scale:

<table>
<thead>
<tr>
<th>Points</th>
<th>Grade</th>
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<tbody>
<tr>
<td>900 - 1000 pts.</td>
<td>A</td>
</tr>
<tr>
<td>800 - 899 pts.</td>
<td>B</td>
</tr>
<tr>
<td>700 - 799 pts.</td>
<td>C</td>
</tr>
<tr>
<td>650 - 699 pts.</td>
<td>D</td>
</tr>
<tr>
<td>0 - 649 pts.</td>
<td>F</td>
</tr>
</tbody>
</table>

VI. Policies:

Attendance Policy:

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.