

Pellissippi State Community College
Master Syllabus

NETWORKING FUNDAMENTALS
CSIT 1730

Class Hours: 3.0
Credit Hours: 4.0
Laboratory Hours: 3.0
Revised: January 2010

Instructor:
Office:
Phone:
Email:

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 also intended for students who plan to take the CompTIA Network+ 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 Course Materials:

Network+ Guide to Networks, Fifth Edition, by Tamara Dean, Course Technology. ISBN-13: 978-1-423-90245-4

I. WEEK/UNIT/TOPIC BASIS:

Week	Topic
1	Defining and Introducing Networking
2-3	Building a Network with the OSI model
3-4	Transmission Basics and Networking Media
3-4	Basic TCP/IP Protocols
4-5	Ethernet Basics, Standards, and Topologies
5-6	Network Hardware; Installing a Physical Network
6-7	WANs and Remote Connectivity
7-8	Wireless Networking
7-8	Network Operating Systems
8-9	TCP/IP In-Depth
9-10	Convergence: Voice and Video Over IP
11-12	Protecting Your Network; Network Security
12-13	Troubleshooting Network Problems
13-14	Ensuring Integrity and Availability
15	Final Exam Period; All Projects DUE!

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 CSIT program.

III. INSTRUCTIONAL PROCESSES:*

Students will:

1. Use Windows operating systems commands and utilities to perform practical tasks for personal computing and networking. (Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy)
2. Demonstrate knowledge of networking, electronic communication, and associated subjects. (Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy)
3. Solve problems encountered in the subjects of networking, electronic communications, and associated subjects. (Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy)
4. Participate in problem-solving teams. (Communication 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, Technological Literacy Outcome, Transitional Strategy, Active Learning Strategy)
7. Practice elements of the work ethic such as punctuality, professionalism, dependability, cooperation, and contribution. (Active Learning Strategy, Transitional Strategy)

*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. 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 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:**

At least three tests will be given during the course of the semester. An alternative is to have examinations after each chapter /subject has been completed. There will be NO make-up tests unless prior arrangements are made with the instructor. Some instructors DO NOT give make-up exams except in extraordinary circumstances.

B. Laboratory Expectations:

Lab assignments will be given during the course of the semester. Lab attendance is required. This is a coordinated laboratory class, and assignments must be completed as scheduled. In addition, students may be assigned a project. Failure to make a passing average in lab assignments and team project may result in a grade of F for the course.

C. Field Work: N/A

D. Other Evaluation Methods: N/A

E. Grading Scale: (the percentage based on the maximum number of points possible in a semester)

93 - 100	A
88 - 92	B+
83 - 87	B
78 - 82	C+
73 - 77	C
65 - 72	D
Below 65	F

VI. POLICIES:

A. Attendance Policy: Pellissippi State 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. [NOTE: No differentiation is noted for excused/unexcused absences. These will be treated as an absence.] (*Pellissippi State Catalog*)

B. Academic Dishonesty: Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions which may be imposed through the regular Pellissippi State procedures as a result of academic misconduct, the instructor has the authority to assign an F or a zero for the exercise or examination or to assign an F in the course. (*Pellissippi State Catalog*)

C. Computer Usage Guidelines: College-owned or –operated computing resources are provided for use by students of Pellissippi State. All students are responsible for the usage of Pellissippi State’s computing resources in an effective, efficient, ethical and lawful manner. (*Pellissippi State Catalog*)

D. Accommodation for Disabilities: Students who need accommodations because of a disability, have emergency medical information to share, or need special arrangements in case the building must be evacuated should inform the instructor immediately, privately after class or in her or his office. Students must present a current accommodation plan from a staff member in Services for Students with Disabilities (SSWD) in order to receive accommodations in this course. Services for Students with Disabilities may be contacted by going to Goins134 or 126 or by phone: 694-6751(Voice/TTY) or 539-7153. More information is available at www.pstcc.edu/departments/swd/