ITNW 1325 – Fundamentals of Networking Technologies

Catalog Description: Instruction in networking technologies and their implementation. Topics include the OSI reference model, network protocols, transmission media, and networking hardware and software. Lecture hours = 3, Lab hours = 1

Prerequisites:

Semester Credit Hours: 3
Lecture Hours per week: 3
Contact Hours per Semester: 64
State Approval Code: 111002000

Course Subject/Catalog Number: ITNW 1325
Course Title: Fundamentals of Networking Technologies

Course Rationale: This course provides students with instruction in networking technologies and their implementation. Topics include the OSI reference model, network protocols, transmission media, and networking hardware and software.

Instructional Goals and Purposes: The purpose of this course is to identify and use network transmission media; explain the OSI model; recognize the primary network topologies/protocols, identify their characteristics, and determine which would be most appropriate for a proposed network; identify the functions of a network operating system and distinguish between centralized, client/server, and peer-to-peer systems; and distinguish between Local Area Networks (LANs) and Wide Area Networks (WANs) and identify the components used to expand a LAN into a WAN.

Learning Objectives:
 1. Define computer networks and describe their purpose
 2. Describe network media and data transmissions
 3. Explain network design and describe the various network topologies
 4. Discuss local area network architectures
 5. Discuss network protocols and network software
 6. Describe the features of Windows servers
 7. Describe the features of NetWare and Linux servers
 8. Describe the issues involved in managing a local area network
 9. Discuss wide area networks
 10. Discuss the Internet and its tools

Specific Course Objectives (Include SCANS information):
After studying the material presented in the text and online, the student should be able to complete all behavioral/learning objectives listed below with a minimum competency of 70% on assignments and exams.

1. **Define computer networks and describe their purpose** (1a-i, 1a-ii, 2c-i, 2c-iv, 2d-i)
   a. Define a computer network.
   b. List the four purposes of a network.
   c. Explain the elements of communication.
   d. List and describe the two types of networks.
2. **Describe network media and data transmissions** (1a-i, 1a-ii, 2c-i, 2c-iv, 2d-i)
   a. Explain how data transmissions are sent and received.
   b. List and describe the types of transmission media.
   c. Describe the functions of a network interface card.
3. **Explain network design and describe the various network topologies** (1a-i, 1a-ii, 2c-i, 2c-iv, 2d-i)
   a. List and describe the characteristics of the mesh, bus, ring, star, and hybrid topologies.
   b. Tell what items should be considered when selecting a network topology.
   c. Define channel access method.
   d. Give the advantages and disadvantages of contention, polling, token passing, and demand priority channel access methods.
4. **Discuss local area network architectures** (1a-i, 1a-ii, 1b-ii, 2a-iii, 2c-i, 2c-iv, 2d-i, 2d-ii, 2d-iii, 2e-i, 2e-iii)
   a. Explain why standards were developed for LANs.
   b. Give several examples of Ethernet architectures.
   c. List the features of a token ring network.
   d. Describe how a wireless LAN functions.
   e. Provide guidelines for designing a network.
5. **Discuss network protocols and network software** (1a-i, 1a-ii, 2c-i, 2c-iv, 2d-i)
   a. Explain the OSI reference model.
   b. Define protocol.
   c. List and describe the functions of TCP/IP.
   d. Explain the functions of client and server network software.
6. **Describe the features of Windows servers** (1a-i, 1a-ii, 2c-i, 2c-iv, 2d-i)
   a. List and describe the features of a Windows 2003 server.
   b. Create and modify a new user account using Windows 2003.
   c. Add users to a group using Windows 2003.
   d. List the new features of the Windows 2008 network operating system.
7. **Describe the features of NetWare and Linux servers** (1a-i, 1a-ii, 2c-i, 2c-iv, 2d-i)
   a. List and describe the features of a NetWare 6 server.
   b. Create and modify a new user account using NetWare 6.
   c. Explain the features of Linux.
   d. Use Linux to set file permissions.

8. **Describe the issues involved in managing a local area network** (1a-i, 1a-ii, 1b-ii, 1b-iii, 2a-iii, 2c-i, 2c-iv, 2d-i, 2d-ii, 2d-iii, 2e-i, 2e-iii)
   a. List the proactive steps to be taken to keep a network server in operation.
   b. Tell how server performance can be monitored.
   c. Explain how SNMP and network monitors are used.
   d. List and describe the features of common network troubleshooting tools.
9. **Discuss wide area networks** (1a-i, 1a-ii, 1b-ii, 2c-i, 2c-iv, 2d-i)
   a. Define a WAN and tell how it is used.
   b. List and describe different WAN technologies.
   c. Explain how to protect a WAN from unauthorized users.
   d. Define privacy.
10. **Discuss the Internet and its tools** (1a-i, 1a-ii, 2c-i, 2c-iv, 2d-i)
    a. Recite a brief history of the Internet.
    b. Tell how the Internet works.
    c. Explain how to use a Web browser, e-mail, a listserv, a newsgroup, and search tools.
    d. Create a document using HTML.

Course Content:
Students in all sections of Fundamentals of Networking will be required to do the following:
   1. Students will submit ten chapter quizzes
   2. Students will take five exams
   3. Student will submit the lab assignments
   4. Students will submit five projects

Methods of Instruction/Course Format/Delivery: Students in both the traditional class and in the Internet class will have access to this course via WebCT. Students in the traditional class will meet regularly for lecture over the material. Students in the Internet class will only be required to meet with the instructor for testing; however, Internet students are always welcome to attend the traditional class (especially for exam reviews). Resources provided through WebCT include

- A calendar displaying assignments each week (please check often)
- PowerPoint slides for each chapter
- Online quizzes, and exams
- Email (totally contained within WebCT)

All quizzes, exams, and assignments will be submitted through WebCT. After an assignment has been graded, the student will be able to view his or her grade by returning to the assignment and clicking the View Scores button or by clicking the My Grades link in the left banner. Students will have limited review of the answers to the exams, but they will always be able to view the score. Work is generally graded and posted within two days following the deadline.

Students in both the traditional and Internet classes should use Email within WebCT to communicate with the instructor. Using WebCT email gives you access to the instructor and other classmates without having to remember or type email addresses—you just select a name from the list. If you are not able to contact your instructor using email in WebCT, you may use his or her Panola College email address. Panola College instructors attempt to respond to all email within 24 hours. Please always include a subject line and your name in your email.

Assessment:
The following items will be assigned during the semester and used to calculate the student's final grade:

- *ONLINE QUIZZES*
  Approximately ten chapter quizzes will be given during the semester. The quizzes will be given online and you may use your textbook to complete them. Each quiz will have a deadline and failure to complete the quiz by the deadline will result in a zero for that quiz. Your lowest quiz grade will be dropped at the end of the semester.

- *ONLINE EXAMS*
  Five exams will be given during the semester. These exams cover selected chapters from the text. Traditional and Internet students should access the schedule in WebCT each week to view the assignment and upcoming test dates.

- *LAB ASSIGNMENTS*
  Several lab assignments will be given during the semester. They can be found by checking the assignment link. These documents will be submitted through the assignment itself and will be graded and returned to you in the same manner.

- *PROJECT ASSIGNMENTS*
  The five project assignments are based on "Projects" located at the end of the textbook lessons. The projects can be found by checking the WebCT assignments link and they will be submitted through the assignment itself and will be graded and returned to you in the same manner.

Course Grade:
The grading scale for this course is as follows:

- Online Quizzes – 8%
- Online Exams – 42%
- Lab Assignments – 10%
- Project Assignments – 40%

All of your grades including a mid-semester and final grade will be posted to My Grades in WebCT.

Texts, Materials, and Supplies:
- *Networking Basics,* Second Edition, Mark Ciampa, ISBN: 0-619-05582
- *LabSim for Network+*, Second Edition, ISBN: 1-4188-3585-4
- Access to a computer and the Internet.

Other:
- For current texts and materials, use the following link to access bookstore listings: http://www.panola.edu/collegestore.htm
- For testing services, use the following link: http://www.panola.edu/instruction/dl/testing.htm

SCANS CRITERIA

1) **Foundation Skills are defined in three areas: basic skills, thinking skills, and personal qualities.**

   a) **Basic Skills:** A worker must read, write, perform arithmetic and mathematical operations, listen, and speak effectively. These skills include:
      i). Reading: locate, understand, and interpret written information in prose and in documents such as manuals, graphs, and schedules.
      ii). Writing: communicate thoughts, ideas, information, and messages in writing, and create documents such as letters, directions, manuals, reports, graphs, and flow charts.
      iii). Arithmetic and Mathematical Operations: perform basic computations and approach practical problems by choosing appropriately from a variety of mathematical techniques.
      iv). Listening: receive, attend to, interpret, and respond to verbal messages and other cues.
      v). Speaking: Organize ideas and communicate orally.

   b) **Thinking Skills:** A worker must think creatively, make decisions, solve problems, visualize, know how to learn, and reason effectively. These skills include.
      i). Creative Thinking: generate new ideas.
      ii). Decision Making: specify goals and constraints, generate alternatives, consider risks, and evaluate and choose the best alternative.
      iii). Problem Solving: recognize problems and devise and implement plan of action.
      iv). Visualize ("Seeing Things in the Mind's Eye"): organize and process symbols, pictures, graphs, objects, and other information.
      v). Knowing How to Learn: use efficient learning techniques to acquire and apply new knowledge and skills.
      vi). Reasoning: discover a rule or principle underlying the relationship between two or more objects and apply it when solving a problem.

   c) **Personal Qualities:** A worker must display responsibility, self-esteem, sociability, self-management, integrity, and honesty.
      i). Responsibility: exert a high level of effort and persevere toward goal attainment.
      ii). Self-Esteem: believe in one's own self-worth and maintain a positive view of oneself.
      iii). Sociability: demonstrate understanding, friendliness, adaptability, empathy, and politeness in group settings.
      iv). Self-Management: assess oneself accurately, set personal goals, monitor progress, and exhibit self-control.
      v). Integrity and Honesty: choose ethical courses of action.

2) **Workplace Competencies are defined in five areas: resources, interpersonal skills, information, systems, and technology.**

   a) **Resources**: A worker must identify, organize, plan, and allocate resources effectively.
      i) Time: select goal-relevant activities, rank them, allocate time, and prepare and follow schedules.
      ii) Money: Use or prepare budgets, make forecasts, keep records, and make adjustments to meet objectives.
      iii) Material and Facilities: Acquire, store, allocate, and use materials or space efficiently **.**
      Examples**:** construct a decision time line chart; use computer software to plan a project; prepare a budget; conduct a cost/benefits analysis; design an RFP process; write a job description; develop a staffing plan.

   b) **Interpersonal Skills**: A worker must work with others effectively.
      i). Participate as a Member of a Team: contribute to group effort.
      ii). Teach Others New Skills.
      iii). Serve Clients/Customers: work to satisfy customer's expectations.

iv). Exercise Leadership: communicate ideas to justify position, persuade and convince others, responsibly challenge existing procedures and policies.
v). Negotiate: work toward agreements involving exchange of resources, resolve divergent interests.
vi). Work with Diversity: work well with men and women from diverse backgrounds.
Examples**:** collaborate with a group member to solve a problem; work through a group conflict situation, train a colleague; deal with a dissatisfied customer in person; select and use appropriate leadership styles; use effective delegation techniques; conduct an individual or team negotiation; demonstrate an understanding of how people from different cultural backgrounds might behave in various situations.

c) **Information**: A worker must be able to acquire and use information.
   i). Acquire and Evaluate Information.
   ii). Organize and Maintain Information.
   iii). Interpret and Communicate Information.
   iv). Use Computers to Process Information.
   Examples**:** research and collect data from various sources; develop a form to collect data; develop an inventory record-keeping system; produce a report using graphics; make an oral presentation using various media; use on-line computer data bases to research a report; use a computer spreadsheet to develop a budget

d) **Systems**: A worker must understand complex interrelationships.
   i). Understand Systems: know how social, organizational, and technological systems work and operate effectively with them.
   ii). Monitor and Correct Performance: distinguish trends, predict impacts on system operations, diagnose deviations in systems' performance and correct malfunctions.
   iii). Improve or Design Systems: suggest modifications to existing systems and develop new or alternative systems to improve performance.
   Examples**:** draw and interpret an organizational chart; develop a monitoring process; choose a situation needing improvement, break it down, examine it, propose an improvement, and implement it.

e) **Technology**: A worker must be able to work with a variety of technologies.
   i). Select Technology: choose procedures, tools or equipment including computers and related technologies.
   ii). Apply Technologies to Task: understand overall intent and proper procedures for setup and operation of equipment.
   iii). Maintain and Troubleshoot Equipment: Prevent, identify, or solve problems with equipment, including computers and other technologies.
   Examples**:** read equipment descriptions and technical specifications to select equipment to meet needs; set up and assemble appropriate equipment from instructions; read and follow directions for troubleshooting and repairing equipment.