

Course Title: COEN 4331: Network Theory

Semester Credit Hours: 3 (3,0)

I. Course Overview

This course examines the structural and theoretical issues underlying networks. Data communication principles and protocols, network structures and open systems are discussed.

II. PMU Competencies and Learning Outcomes

This course concentrates on theoretical and technical issues. Students in this course enhance their interpersonal and group effectiveness skills.

III. Detailed Course Description

COEN 4311: Network Theory is concerned with the structure of data communications; from the electric interface, flow control, medium access control protocols, through data transmission and network protocols, packet switching and frame relay protocols, and includes an examination of network standards, and open systems.

IV. Requirements Fulfilled

This course is an available elective for all degree programs in the College of Information Technology. It should be taken no earlier than the senior year.

V. Required Prerequisites

ITAP 2431: Network Management

VI. Learning Outcomes

In this course, students learn:

- To develop an understanding of physical, theoretical and structural issues related to the construction of computer networks.
- To develop an understanding of the principles of electronic communication and the practical application to the organization and management of networks.
- To develop improved communication and collaborative skills in meeting security threats as a team member or team leader.

VII. Assessment Strategy

This course is designed to introduce students to the physical, theoretical and practical principles underlying computer networks. Course grades are based on:

- Weekly assigned homework to motivate students to do the work and earn credit accordingly.
- Weekly readings in current network literature.
- Four academic writing assignments related to specific networking issues.
- Two in-class exams to assess the student's accumulative mastery of content covered prior to time of exam.
- A comprehensive final exam to assess the student's accumulative mastery of course material.

The final grades is based on 20% credit for the homework, 20% for the weekly readings, 20% for the academic writing assignments, 20% on in-class exams and 20% for the final examination.

VIII. Course Format

This course is primarily a lecture course. Students are expected to attend three hours of lecture per week.

Classroom Hours (3 hours per week)

Class: 3

Web supplement: Course home page (the university's Web tool, WebCT or Blackboard) should contain the following:

- Course syllabus.
- Course assignments.
- Keys to exams (after students have completed them).
- Course calendar (an active utility).
- Course e-mail (an active utility).
- Course discussion list (an active utility).
- Students course marks. (an active utility).

IX. Topics to be Covered

- A. Open standards OSI/ TCP, ISO/RM
- B. Electrical interface, transmission media
- C. Data representations
- D. Error control/ flow control
- E. Data link protocols
- F. Commercial grade transmission protocols
- G. Packet switching and frame relay
- H. Addressing, routing and congestion control
- I. Data/voice and video transmission issues
- J. Session and presentation protocols
- K. Application protocols

X. Laboratory Exercises

There are no lab exercises for this course.

XI. Technology Component

This course makes use of the university's wireless access infrastructure during the class/lecture sessions. In addition, the course makes use of WebCT and other interactive communication tools to enhance communication between the instructor and the students.

XII. Special Projects/Activities

There are no special projects for this course.

XIII. Textbooks and Teaching Aids

A. Required Textbook

Data and Computer Communications, Stallings, W. (2000)
Prentice-Hall, Upper Saddle River, NJ
ISBN: 0-13-084370-9

B. Alternative Textbooks

Data Communications, Computer Networks and Open Systems,
Halsall, F. (1996)
Addison Wesley Longman
ISBN: 0-201-42293-X

Computer communications and Networking Technologies, Gallo, M.A.
& Hancock, W.M. (2002), Thomson/Course Technology
ISBN: 0-534-37780-7

C. Supplemental Print Materials

As available from publisher.

D. Supplemental Online Materials

As available from publisher.