

## ECE 470 – DATA COMMUNICATIONS

Type (check one): Required: \_\_\_\_\_ Elective:  X

**2005-2006 Catalog Data:** ECE 470: Data Communications. Elements of data communication and the ISO reference model. Network structure, architectures and protocol hierarchies. Algorithms and heuristics for design of computer network topology. Physical basis for data communication. Synchronous and asynchronous data communication, interface standards, data channels and modulation schemes. Data link protocols. Point-to-point, satellite, packet radio, and local area networks. Written reports are required for each of the three design projects. (Same as CS 415.) Prerequisite: ECE 335. Offered in the Fall semester. *One semester; three credits.*

**Prerequisites:** ECE 335

**Co-Requisites:** CS 325

**Textbook:** William Stallings, *Data & Computer Communications*, 7<sup>th</sup> Edition, Prentice Hall, New Jersey, 2004.

**Other Required Materials:** None

**Other References:** Andrew S. Tanenbaum, *Computer Networks*, Prentice Hall, 1988.

**Instructor:** Dr. Juan Carlos Olabe-Basogain, Professor of Electrical Engineering.

**Course Objectives:** The objective of this course is to teach the fundamentals of telecommunication networks design and performance analysis.

**Prerequisites by Topics:** 1. Probability and Statistics.

### Topics:

- 01: Introduction.
- 02: Protocols and Architecture.
- 03: Data Transmission.
- 04: Transmission Media.
- 05: Data Encoding.
- 06: The Datacommunication Interface.
- 07: Data Link Control. Multiplexing.
- 08: Circuit Switching. Research Paper 1.
- 09: Packet Switching. ATM and Frame Relay.
- 10: Congestion Control in Data Networks.
- 11: LAN Technology. LAN Systems.
- 12: Internet Protocols. Internetwork Operation.
- 13: Transport Protocols. Network Security.
- 14: Distributed Applications.
- 15: Research Paper 2. Presentation.

**Class Schedule:** Three 50-minute sessions per week

**Prepared by:** Dr. Juan Carlos Olabe-Basogain **Date:** October 2005