

Department of Electrical and Computer Engineering

TCN 4212 – TELECOMMUNICATION NETWORK ANALYSIS AND DESIGN (Elective)

Catalog Description:

The Principle and practice of telecommunication and computer networks with emphasis on telecommunication network protocols, datagram services, routing and QoS. (3 Credits)

Prerequisite:

EEE 3514 or permission of the instructor

Textbook:

Computer Networks, A. Tanenbaum, 4th ed., Prentice Hall PTR, 2002

Learning Outcomes:

The goal of this course is to introduce the basic concepts and principles underlying packet-based networks. Introduction to telecommunication networks and existing network technologies and protocols, and a comprehensive view of structure and components of computer networks, functions and services, circuit and packet switching, and the OSI reference model. The students will explore the concepts and details of network layer (datagram service, routing algorithm and protocols, routing congestion control, and Internet Protocol) with an emphasis of functionality and analysis.

Topics Covered:

1. Introduction to Telecommunication Networks: Circuit Switching & Packet Switching, Structure and Types of Telecommunication Networks
2. Layered Protocol Architecture, OSI reference Model, and Internet Architecture
3. The Physical Layer: Transmission Media and Physical Interfaces and Protocols
4. The Network Layer: Role of the Network Layer, Routing in Circuit and Packet Networks, the Internet Protocol, Internet Protocol Addressing, IP Datagram, IP Encapsulation, Fragmentation, and Reassembly, Routing Algorithms, Multicasting
5. The Transport Layer: UPD, TCP, TCP Congestion Control
6. Multimedia Networking

Class Schedule:

Twice a week, 75 minutes each session

Contribution of course to meeting the professional component:

Engineering Science

Relationship of course to program outcomes:

In the course TCN 4212 the student will have to show

- (a) an ability to apply knowledge of mathematics, science and engineering

- (e) an ability to identify, formulate, and solve engineering problems
- (j) a knowledge of contemporary issues
- (m) an ability to apply knowledge of advanced math (D.E., Linear Algebra, Complex Variables, Discrete Math)

Person(s) who prepared this description and date of preparation:
Hao Zhu, Assistant Professor; Kia Makki, Professor - April 28, 2007