

ECE 54700 - Introduction to Computer Communication Networks

Type of Course

Technical Elective for the CmpE and EE programs

Catalog Description

A qualitative and quantitative study of the issues in design, analysis, and operation of computer communication and telecommunication networks as they evolve toward the integrated networks of the future, employing both packet and circuit switching technology. The course covers packet and circuit switching, the OSI standards architecture and protocols, elementary queuing theory for performance evaluation, random access techniques, local area networks, reliability and error recovery, and integrated networks.

Credits

3, Dual Level, Undergraduate-Graduate

Contact Hours

3

Prerequisite Courses

ECE 30200 or equivalent.

Textbook

James F. Kurose and Keith W. Ross, Computer Networking: A Top Down Approach, Pearson, current Edition.

Course Objectives

To introduce students to the design, analysis and performance evaluation of computer communication and telecommunication networks through an understanding of their architectures and protocols.

Course Outcomes

1. On successful completion of this course, students should be able to:
2. Understand the basic terminology, concepts, and components of computer networks and the layered architecture of the Internet. (1)
3. Calculate simple network performance metrics such as delay, loss, and throughput. (1)
4. Understand the key concepts of application layer protocols.(1)
5. Understand the principles of transport layer and how these principles are implemented in existing protocols, in particular UDP and TCP. (1)
6. Understand how packet forwarding and routing are performed in the Internet using different protocols. (1)

7. Understand the basic design and performance issues of link layer techniques (e.g., error detection and correction, multiple access) and the design of switched local area networks. (1)
8. Use a packet sniffer to observe and analyze network data traffic. (6)
9. Perform a study on recent advances of network technologies. (7)
10. Present the study in forms of a written report and an oral presentation. (3)

Lecture Topics

1. Topics
2. Introduction to computer networks and the Internet
3. Application layer
4. Transport layer
5. Network layer
6. Link layer and local area networks

Computer Usage

Medium

Laboratory Experience

Medium

Design Experience

None

Coordinator

Chao Chen, Ph.D.

Date

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