

EECS 148 INTRODUCTION TO COMPUTER NETWORKS

(Elective for CpE and CSE)

- Catalog Data:** **EECS 148 Introduction to Computer Networks (Credit Units: 4)**
Network architectures, models, protocols, routing, flow control, and services. Queuing models for network performance analysis.
Prerequisites: EECS40 or consent of instructor, EECS112 or consent of instructor, and EECS140 or Mathematics 67. Formerly ECE161. (Design units: 2)
- Textbook:** *Communication Networks: A First Course*, 2nd edition, Jean Walrand, McGraw Hill, 1998.
- References:** *Computer Networks*, Andrew Tanenbaum, Prentice-Hall
Computer Networks: A Systems Approach, Larry Peterson & Bruce Davie, Morgan Kaufmann
High- Performance Communication Networks, Jean Walrand & Pravin Varaiya, Morgan Kaufmann
Computer Networking: A Top-Down Approach Featuring the Internet James Kurose & Keith Ross, Addison-Wesley
Communication Networks: Fundamental Concepts and Key Architectures, Albert Leon- Garcia & Indra Widjaja, McGraw Hill
Data and Computer Communications, William Stallings, Prentice-Hall
- Coordinator:** Scott Jordan
- Course Objectives:** Understand the basic technical components of different types of networks. Understand how the architecture of a network relates to the requirements of the target application.
- Course Outcomes:** Students will:
Calculate transmission, propagation, and queuing delays.
Analyze LAN medium access protocols, and explain LAN switch and router operation.
Explain Internet addressing and naming
Analyze Internet routing and flow control protocols.
Build basic probability models of network phenomena
Describe when circuit-switching, packet-switching or virtual circuit is more appropriate.
Explain architectural difference between telephone networks, Internet, and ATM
- Prerequisites By Topic:** Socket programming (instructor- dependant)
Organization of digital computers (instructor- dependent)
Probability
- Lecture Topics:** Telephone networks: architecture, protocols, (1 week)
LANs: ALOHA, Ethernet, Token ring, wireless LANs (2 Weeks)
Performance: a switch model, delay, throughput, loss (2 Weeks)

Internet: naming, addressing, routing, TCP/IP, ARQ protocols, flow control (3 weeks)

Class Schedule: Meets for 3 hours of lecture and 1 hour of discussion each week for 10 weeks.

Computer Usage: Optional

Laboratory Projects: None

Professional Component: Contributes toward the Electrical Engineering and Computer Science Major requirements.

Relationship to Program Outcomes: The course relates to the Program Outcomes a and c as stated at:
<http://undergraduate.eng.uci.edu/degreeprograms/computer/mission>

Design Content Description

Approach: Three weeks of this course are devoted to elementary design of basic routing and flow control protocols. In particular, time is devoted to (a) the design of basic routing algorithms, (b) the design of basic flow control protocols.

Lectures: 50%, Homework – 50%

Laboratory Portion:

Grading Criteria:

Problem Sets:	25%
Midterm:	30%
Final Exam:	45%
	100%

Estimated ABET Category Content:

Mathematics and Basic Science: 0 credit units or 0%

Engineering Science: 2 credit units or 50%

Engineering Design: 2 credit units or 50%

Prepared by: Scott Jordan/Kevin Tsai **Date:** July 2007

CEP Approved: Fall 2005