

King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering
Department of Computer Engineering
COE 540: Computer Networks (3-0-3)

Textbook:

1. Dimitri Bertsekas and Robert Gallager, *Data Networks*, second edition, 1992, Prentice Hall, Inc., and
2. J. F. Kurose and K. W. Ross *Computer Networking: A Top-Down Approach featuring the Internet*, 3rd Edition, 2005, Prentice Hall Publishing Company.

References:

1. Tanenbaum, Andrew S., *Computer Networks*, 4th Edition., Prentice Hall Publishing Company, 2003.
2. Garcia, L., and Widjajm I., *Communication Networks*, 2nd Edition, 2006.
3. Garcia, L., *Probability and Random Processes for Electrical Engineering*, 2nd Edition, Addison Wisely,

Instructor: Dr. Ashraf S. Mahmoud (Room 22-148-3, Ext 1724, email: ashraf@kfupm.edu.sa)

Class Time/Place: UT 17:00-18:15 pm – Building 22, Room 130.

Office Hours: UT 09:00-10:00 and SM 11:00-12:40 (excluding prayer times) or by appointment.

Catalog Description:

Computer Networking concepts. Basic Terminology; Protocols; Communication Architectures; OSI Reference Model, Protocol suites. Data Link Layer; ARQ Strategies; Analysis of ARQ Strategies. Multi-access communication. Introduction to ATM Delay Models in Data Networks; Introduction to performance analysis; Little's Theorem; Single queue models; Network of queues. Network layer. Routing in Data Networks. Flow and Congestion Control. Transport layer. Application Layer.

Tentative Grading Policy:

• Quizzes/Homework:	25%	
• Major Exam:	20%	Week of Dec 20th or 27th
• Final Exam:	30% (Comprehensive)	Scheduled by Registrar
• Project*	25%	

Tentative Date

Total	<u>100%</u>
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* A separate handout will be distributed describing the offered projects and the respective deadlines and subweights.

TENTATIVE Weekly Course Schedule

Week	Topic	Textbook Section⁺
1	Introduction and Layered Network Architecture	Chapter 1 (Gallager)
2	Physical Layer (channels and Modems), Error Detection	Sections 2.1, 2.2 & 2.3 (Gallager)
3	ARQ Strategies, Framing, Standard DLCs Sections 2.8, 2.9 and 2.10 are designated as Reading Assignment	Sections 2.4, 2.5, & 2.6 (Gallager)
4	Review of Probability, Statistics and Basics of Markov Processes	Chapter 3 (Garcia) – preferably 4 and 5 too.
5	Review of Probability, Statistics and Basics of Markov Processes Introduction to Delay Models (Little's Formula, M/M/1 Model)	Chapter 3 & 9 (Garcia) – preferably 4 and 5 too.
6	Introduction to Delay Models (M/M/c and derivative Models, basic M/G/1 formulas, Burke's Theorem, Jackson's Theorem)	Chapter 3 (Gallager) & Chapter 9 (Garcia)
7	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	Sections 4.1, 4.2 & 4.3 (Gallager) + notes
8	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	Sections 4.1, 4.2 & 4.3 (Gallager) + notes
9	Application Layer (Principles, Web/HTTP, FTP, Email, DNS)	Sections 2.1, 2.2, 2.3, 2.4, 2.5 (Kurose)
Midterm Exam (Week of December 20th or 27th)		
10	Transport Layer (Multiplexing, Demultiplexing, Connectionless (UDP)/ Connection-Oriented (TCP) protocols)	Sections 3.1, 3.2, 3.3 and 3.5 (Kurose)
11	Transport Layer (Congestion Control, TCP Congestion Control)	Sections 3.6, 3.7, & 3.8 (Kurose)
12	Network Layer (Routing Principles, Hierarchical Routings, Internet Protocol)	Sections 4.1, 4.2, 4.3 & 4.4 (Kurose)
13	Network Layer (Routing in the Internet, Router Operation, IPv6, etc.)	Sections 4.5, 4.6, 4.7, 4.8, ... (Kurose)
14	Presentation of Projects	
15	Presentation of Projects	
Final Exam (Comprehensive – Scheduled by Registrar)		

⁺ Students will be responsible for material covered in class or material that is designated as part of the self-learning component of the course.