

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 6:30-7:45 pm – Building 22, Room 130.

Office Hours: UT 10:00-11:00 and 4:45-6:00 pm (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/Homeworks:	25%	
• Major Exam:	20%	Thursday April 10 th
• Final Exam:	30% (Comprehensive)	Scheduled by Registrar
• Project*	25%	

Tentative Date

Total 100%

* 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 (Feb 16 th)	Introduction and Layered Network Architecture	Chapter 1 (Gallager)
2 (Feb 23 rd)	Physical Layer (channels and Modems), Error Detection	Sections 2.1, 2.2 & 2.3 (Gallager)
3 (Mar 1 st)	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 (Mar 8 rd)	Review of Probability, Statistics and Basics of Markov Processes	Chapter 3 (Garcia) – preferably 4 and 5 too.
5 (Mar 15 th)	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 (Mar 22 nd)	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 (Mar 29 th)	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	Sections 4.1, 4.2 & 4.3 (Gallager) + notes
8 (Apr 5 th)	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	Sections 4.1, 4.2 & 4.3 (Gallager) + notes
9 (Apr 19 th)	Application Layer (Principles, Web/HTTP, FTP, Email, DNS)	Sections 2.1, 2.2, 2.3, 2.4, 2.5 (Kurose)
Midterm Exam (Week of April 5th – Thursday April 10th)		
10 (Apr 26 th)	Transport Layer (Multixplexing, Demultiplexing, Connectionless (UDP)/ Connection-Oriented (TCP) protocols)	Sections 3.1, 3.2, 3.3 and 3.5 (Kurose)
11 (May 3 rd)	Transport Layer (Congestion Control, TCP Congestion Control)	Sections 3.6, 3.7, & 3.8 (Kurose)
12 (May 10 th)	Network Layer (Routing Principles, Hierarchical Routings, Internet Protocol)	Sections 4.1, 4.2, 4.3 & 4.4 (Kurose)
13 (May 17 th)	Network Layer (Routing in the Internet, Router Operation, IPv6, etc.)	Sections 4.5, 4.6, 4.7, 4.8, ... (Kurose)
14 (May 24 th)	Presentation of Projects	
15 (May 31 st)	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.