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* , 5th Edition, 2008, 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: SM 17:00-18:15 pm – Building 22, Room 134.
Office Hours: Sunday 17:00-18:00, Monday/Tuesday 12:15-13:00 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:		***Tentative* Date**
• Quizzes/Homework:	**25%**	
• Major Exam:	**20%**	To be determined
• Final Exam:	**30%**	7:00 pm June 5th, 2011 (Rm TBD)
• Project*	**25%**	
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	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 (Tentative Week)		
10	Transport Layer (Multixplexing, 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.*