King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering
Department of Computer Engineering
COE 540/ICS 570: 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* , 2nd Edittion, Prentice Hall Publishing Company.

References:
1. Jean Walrand, *Communication Networks: A First Course,* Second Edition, McGraw-Hill, 1998.
2. Tanenbaum, Andrew S., *Computer Networks 3rd ed.*, Prentice Hall Publishing Company.
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 5:00-6:15 pm – Building 22, Room 130.
Office Hours: UT 11:30-12:50 (excluding prayer time) and 3:30-4:30 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/Homeworks:	**17%**	
• Major Exam:	**18%**	Tues Nov 20th or Thurs Nov 22nd
• Final Exam:	**35%** (*Comprehensive*)	Scheduled by Registrar
• Project*	**30%**	
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 (Sept 9th)	Introduction and Layered Network Architecture	**Chapter 1 (Gallager)**
2 (Sept 16th)	Physical Layer (channels and Modems), Error Detection	**Sections 2.1, 2.2 & 2.3 (Gallager)**
3 (Sept 23rd)*	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 (Sept 30th)	Review of Probability, Statistics and Basics of Markov Processes	**Chapter 3 (Garcia) – preferably 4 and 5 too.**
5 (Oct 21st)	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 (Oct 28th)	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 (Nov 4th)	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	**Sections 4.1, 4.2 & 4.3 (Gallager) + notes**
8 (Nov 11th)	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	**Sections 4.1, 4.2 & 4.3 (Gallager) + notes**
9 (Nov 18th)	Application Layer (Principles, Web/HTTP, FTP, Email, DNS)	**Sections 2.1, 2.2, 2.3, 2.4, 2.5 (Kurose)**
Midterm Exam (Week of Nov 17th – to be decided in class)		
10 (Nov 25th)	Transport Layer (Multixplexing, Demultiplexing, Connectionless (UDP)/ Connection-Oriented (TCP) protocols)	**Sections 3.1, 3.2, 3.3 and 3.5 (Kurose)**
11 (Dec 2nd)	Transport Layer (Congestion Control, TCP Congestion Control)	**Sections 3.6, 3.7, & 3.8 (Kurose)**
12 (Dec 9th)	Network Layer (Routing Principles, Hierarchical Routings, Internet Protocol)	**Sections 4.1, 4.2, 4.3 & 4.4 (Kurose)**
13 (Dec 30th)	Network Layer (Routing in the Internet, Router Operation, IPv6, etc.)	**Sections 4.5, 4.6, 4.7, 4.8, … (Kurose)**
14 (Jan 6th)	Presentation of Projects	
15 (Jan 13th)	Presentation of Projects	
Final Exam (Comprehensive – Scheduled by Registrar)		

Sept 23rd is a National Holiday – Makeup work day will be Thursday Oct 25th.
[+] *Students will be responsible for material covered in class or material that is designated as part of the self-learning component of the course.*