

**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* , 3<sup>rd</sup> Edition, 2005, Prentice Hall Publishing Company.

**References:**

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

**Instructor:** Dr. Ashraf S. Mahmoud (Room 22-148-3, Ext 1724, email: [ashraf@kfupm.edu.sa](mailto: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:	<b>25%</b>	
• Major Exam:	<b>20%</b>	Thursday April 10 <sup>th</sup>
• Final Exam:	<b>30% (Comprehensive)</b>	Scheduled by Registrar
• Project*	<b>25%</b>	

**Tentative Date**

Total **100%**

\* A separate handout will be distributed describing the offered projects and the respective deadlines and subweights.

**TENTATIVE Weekly Course Schedule**

<b>Week</b>	<b>Topic</b>	<b>Textbook Section<sup>+</sup></b>
1 (Feb 16 <sup>th</sup> )	Introduction and Layered Network Architecture	<b>Chapter 1 (Gallager)</b>
2 (Feb 23 <sup>rd</sup> )	Physical Layer (channels and Modems), Error Detection	<b>Sections 2.1, 2.2 &amp; 2.3 (Gallager)</b>
3 (Mar 1 <sup>st</sup> )	ARQ Strategies, Framing, Standard DLCs Sections 2.8, 2.9 and 2.10 are designated as Reading Assignment	<b>Sections 2.4, 2.5, &amp; 2.6 (Gallager)</b>
4 (Mar 8 <sup>rd</sup> )	Review of Probability, Statistics and Basics of Markov Processes	<b>Chapter 3 (Garcia) – preferably 4 and 5 too.</b>
5 (Mar 15 <sup>th</sup> )	Review of Probability, Statistics and Basics of Markov Processes Introduction to Delay Models (Little's Formula, M/M/1 Model)	<b>Chapter 3 &amp; 9 (Garcia) – preferably 4 and 5 too.</b>
6 (Mar 22 <sup>nd</sup> )	Introduction to Delay Models (M/M/c and derivative Models, basic M/G/1 formulas, Burke's Theorem, Jackson's Theorem)	<b>Chapter 3 (Gallager) &amp; Chapter 9 (Garcia)</b>
7 (Mar 29 <sup>th</sup> )	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	<b>Sections 4.1, 4.2 &amp; 4.3 (Gallager) + notes</b>
8 (Apr 5 <sup>th</sup> )	Multiaccess Communication (Aloha, Tree Algorithms, CSMA, Reservation, FDMA/TDMA, CDMA, etc.)	<b>Sections 4.1, 4.2 &amp; 4.3 (Gallager) + notes</b>
9 (Apr 19 <sup>th</sup> )	Application Layer (Principles, Web/HTTP, FTP, Email, DNS)	<b>Sections 2.1, 2.2, 2.3, 2.4, 2.5 (Kurose)</b>
<b>Midterm Exam (Week of April 5<sup>th</sup> – Thursday April 10<sup>th</sup>)</b>		
10 (Apr 26 <sup>th</sup> )	Transport Layer (Multixplexing, Demultiplexing, Connectionless (UDP)/ Connection-Oriented (TCP) protocols)	<b>Sections 3.1, 3.2, 3.3 and 3.5 (Kurose)</b>
11 (May 3 <sup>rd</sup> )	Transport Layer (Congestion Control, TCP Congestion Control)	<b>Sections 3.6, 3.7, &amp; 3.8 (Kurose)</b>
12 (May 10 <sup>th</sup> )	Network Layer (Routing Principles, Hierarchical Routings, Internet Protocol)	<b>Sections 4.1, 4.2, 4.3 &amp; 4.4 (Kurose)</b>
13 (May 17 <sup>th</sup> )	Network Layer (Routing in the Internet, Router Operation, IPv6, etc.)	<b>Sections 4.5, 4.6, 4.7, 4.8, ... (Kurose)</b>
14 (May 24 <sup>th</sup> )	Presentation of Projects	
15 (May 31 <sup>st</sup> )	Presentation of Projects	
<b>Final Exam (Comprehensive – Scheduled by Registrar)</b>		

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