King Fahd University of Petroleum and Minerals
College of Computer Sciences and Engineering

Department of Computer Engineering

COE 344 Computer Networks (3-3-4)

Instructor: Dr. Marwan Abu-Amara
Office: 22-145
Phone: 1632
E-mail: marwan@kfupm.edu.sa
Term: 152 (2nd term 2015–2016)
Day & Time: UT 11:00 AM – 12:15 PM
Location: 24-133
Prerequisite: COE 241 and STAT 319
Textbook: *Computer Networking: A Top-Down Approach Featuring the Internet*, J. Kurose & K. Ross, Addison Wesley, 6th Edition, 2012.
Office Hours: UT 10:00 AM – 10:50 AM or by appointment
Web Site: http://faculty.kfupm.edu.sa/COE/marwan

Tentative Grading Policy:

- Homeworks **10%**
- Quizzes **10%**
- Lab **25%**
- Major Exam I ..... **15%** (Week 07 – Sunday February 28, 2016 during class period)
- Major Exam II ..... **15%** (Week 13 – Sunday April 17, 2016 during class period)
- Final Exam ..... **25%** (*Comprehensive* – Tuesday May 10, 2016, 8:00 AM)

IMPORTANT NOTES:

- All KFUPM regulations and standards will be enforced. Attendance will be checked each class. The KFUPM rule pertaining to a DN grade will be strictly enforced (i.e. **> 6 absences** will result in a DN grade). *Check your university e-mail regularly for warnings regarding your absences.*
- If you are late to the class for more than 10 minutes (i.e. arrive after 11:10 AM), you will **NOT be allowed to enter** the classroom and you will be considered absent for that class.
- Only university approved/certified excuses will be accepted.
- Use of cell phones, smart phones, and tablets during class period and during exams is absolutely **prohibited**.
- Homeworks are to be submitted **in class** on the due date during the class period. Late homeworks will **NOT be accepted**.
- You have up to the next class period to object to the grade of a homework, a quiz, or a major exam from the end of the class time in which the graded papers have been distributed back. If for some reason you cannot contact me within this period, send me an email requesting an appointment. The email should be sent within the 48-hour time period.
- **NO make-up exams**. ALL homeworks and quizzes will be counted towards your grade.
- Final exam is **comprehensive**.

Tentative schedule

Week		Topic	Section(s)	Lab Experiments
1	Introduction (Chapter 1)	What is the Internet, What is a protocol? Network Edge and Network Core Delay and Loss in Packet-Switched Networks Protocol Layers and Their Service Models Networks Under Attack Brief History of Computer Networking and the Internet (reading material)	1.1 1.2, 1.3 1.4 1.5 1.6 1.7	Introduction: Lab setting, Network devices, etc.
2	Application Layer (Chapter 2)	Principles of Network Applications The World Wide Web: HTTP File Transfer: FTP	2.1 2.2 2.3	Lab1: Basic LAN Implementation
3		Electronic Mail in the Internet The Internet's Directory Service: DNS	2.4 2.5	Lab2: Application Layer – HTTP and FTP
4		P2P Applications	2.6	Lab3: Application Layer - DNS, SMTP, and POP3
5	Transport Layer (Chapter 3)	Transport-Layer Services and Principles Multiplexing and Demultiplexing Applications	3.1 3.2	Lab4: Socket Programming
6	Transport Layer (Chapter 3)	Connectionless Transport: UDP Principles of Reliable Data Transfer: TCP case study Principles of Congestion Control	3.3 3.5 3.6	Lab5: Wireshark Lab - Application Layer Protocols
7		Principles of Congestion Control	3.6	Lab6: Wireshark Lab - Transport Layer Protocols
8	Network Layer (Chapter 4)	Introduction and Network Service Models What is Inside a Router? IP: the Internet Protocol	4.1, 4.2 4.3 4.4	Lab7: Wireshark Lab – Network Layer Protocols
		Midterm Vacation (March 13th, 2016 – March 17th, 2016)		
9	Network Layer (Chapter 4)	Routing Algorithms Hierarchical Routing Routing in the Internet	4.5 4.5.3 4.6	Lab8: IPv4 & DHCPv4
10	Link Layer (Chapter 5)	Link Layer: Introduction & Services Multiple Access Protocols and LANs	5.1 5.3	Lab9: Routing Protocols; Static Routing
11		LAN Addresses and ARP Ethernet Switches & VLANs	5.4 5.4 5.4	Lab10: Routing Protocol – OSPFv2
12		Link Virtualization: MPLS Data Center Networking A Day in the Life of a Web Page Request	5.5 5.6 5.7	Lab11: Ethernet Frame and ARP Protocol
13	Wireless & Mobile Net (Chapter 6)	Wireless Links & Network Characteristics Wireless LANs: IEEE 802.11 WPAN & Bluetooth Mobile networking (introduction)	6.1, 6.2 6.3 6.3.6 6.5, 6.6, 6.8	Lab12: Virtual Local Area Network – VLAN
14	Multimedia Networking (Chapter 7)**	Multimedia Networking Applications Streaming Stored Video	7.1 7.2	Lab13: Network Address Translation - NAT
15		Review		Lab14: Project Implementation

* Week 1 begins on ***January 17, 2016***

** If time permits

Course Learning Outcomes

Course Learning Outcomes	Outcome Indicators and Details	Assessment Methods and Metrics	Min. Weight	ABET 2000 Criteria
1. Ability to apply knowledge of mathematics, probability, and statistics to model and analyze some networking protocols.	• Packet and circuit switching modeling, analysis, and comparison. • Modeling of some MAC protocols.	• Assignments • Quizzes • Exams	**18%**	A (M)
2. Ability to design, implement, and analyze simple computer networks.	• Experiments on LAN design and implementation. • Protocol analysis. • Use of networking tools.	• Lab assignments • Lab work	**6%**	B (L)
3. Ability to identify, formulate, and solve network engineering problems.	• Identify and solve reliable data transfer problems over IP Networks. • Identify and solve network addressing problems. • Identify, compare, and contrast different routing protocols.	• Assignments • Quizzes • Exams • Lab work	**35%**	E (H)
4. Knowledge of contemporary issues in computer networks.	• Contemporary networking technologies.	• Assignments	**5%**	J (L)
5. Ability to use techniques, skills, and modern networking tools necessary for engineering practice.	• Setup networking services. • Setup and basic configuration of networking devices. • Networking tools. • Traffic analyzers. • Troubleshooting network problems. • Different operating systems.	• Lab work	**9%**	K (L)