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
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Term: 171 (1st term 2017–2018)
Day & Time: UT 11:00 AM – 12:15 PM
Location: 24-151
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: UTR 10:00 AM – 10:50 AM (or by appointment)
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Tentative Grading Policy:

- Homeworks **10%**
- Quizzes **10%**
- Lab **25%**
- Major Exam I ....**15%**   (Week 07 – Sunday October 29, 2017 during class period)
- Major Exam II ....**15%**   (Week 13 – Sunday December 10, 2017 during class period)
- Final Exam ....**25%**   (*Comprehensive* – Wednesday January 03, 2018, 7:00 PM)

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).
- Only university approved/certified excuses will be accepted, and should be presented **no later than 1 week** after absence.
- 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	1.1 1.2, 1.3 1.4	Lab Meeting
2		Protocol Layers and Their Service Models Networks Under Attack Brief History of Computer Networking and the Internet (reading material)	1.5 1.6 1.7	Lab Introduction
3	Application Layer (Chapter 2)	Principles of Network Applications The World Wide Web: HTTP File Transfer: FTP	2.1 2.2 2.3	IPv4 Addressing
4		Electronic Mail in the Internet The Internet's Directory Service: DNS	2.4 2.5	Introduction to Wireshark
5		P2P Applications	2.6	Application Layer – HTTP Protocol
6	Transport Layer (Chapter 3)	Transport-Layer Services and Principles Multiplexing and Demultiplexing Applications	3.1 3.2	Lab Activities – 1
7		Connectionless Transport: UDP Principles of Reliable Data Transfer: TCP case study Principles of Congestion Control	3.3 3.5 3.6	Application Layer – DNS Protocol
8		Principles of Congestion Control	3.6	Transport Layer – TCP and UDP Protocols
9	Network Layer (Chapter 4)	Introduction and Network Service Models What is Inside a Router?	4.1, 4.2 4.3	Transport Layer – TCP Protocol Reliability
10		IP: the Internet Protocol	4.4	Network Layer – Ipv4 and ICMP Protocols
11		Routing Algorithms Hierarchical Routing Routing in the Internet	4.5 4.5.3 4.6	Routing Protocols – Static Routing
12	Link Layer (Chapter 5)	Link Layer: Introduction & Services Multiple Access Protocols and LANs LAN Addresses and ARP Ethernet Switches & VLANs	5.1 5.3 5.4 5.4 5.4	Lab Activities – 2
13		Link Virtualization: MPLS Data Center Networking A Day in the Life of a Web Page Request	5.5 5.6 5.7	Network Address Translation (NAT)
14	Wireless & Mobile Net (Chapter 6)	Wireless Links & Network Characteristics Wireless LANs: IEEE 802.11 Mobile networking (introduction)	6.1, 6.2 6.3 6.5, 6.6, 6.8	Data-Link Layer: Ethernet and ARP Protocols
15		Review		Lab Final

* Week 1 begins on *September 17, 2017*

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)