



Course Syllabus: Computer Networks - CS 244

Division	Computer, Electrical and Mathematical Sciences & Engineering
Course Number	CS 244
Course Title	Computer Networks
Academic Semester	Spring
Academic Year	2016/2017
Semester Start Date	01/22/2017
Semester End Date	05/18/2017
Class Schedule (Days & Time)	09:00 AM - 10:30 AM Sun Tue

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Basem Shihada	basem.shihada@kaust.edu.sa			Monday 11:00-12:00PM in Building 1, Room 4210

Teaching Assistant(s)	
Name	Email
Enas Ahmad	enas.ahmad@kaust.edu.sa

Course Information	
Comprehensive Course Description	The course aims to train students in conducting major research in relevant aspects of wireless networks. In particular, green wireless technologies, standards, and protocols for various communication technologies such as cellular networks, packet switched networks, cloud communication, cooperative wireless networks. Also, students will tackle topics on wireless routing, PHY-layer, and MAC-layer.
Course Description from Program Guide	Packet switching, Internet architecture, routing, router architecture, control algorithms, retransmission algorithms, congestion control, TCP/IP, detecting and recovering from errors, switching, Ethernet (wired and wireless) and local area networks, physical layers, clocking and synchronization. Assignments introduce network programming using NS-3, sockets, designing a router and implementing a transport layer. Also, advanced research papers on cloud computing, software define networking, and wireless sensor networks. The course consists of a final implementation project on a novel idea.
Goals and Objectives	Students will become familiar with the field of networking research. For instance, network architecture, protocols and systems. They will also obtain a practical experience in the art of reading research papers and conducting large scale networking systems and simulations.
Required Knowledge	Solid knowledge in computer systems, excellent skills in C/C++, network simulators such as NS-2 and 3, and Linux programming.
Reference Texts	<ul style="list-style-type: none"> -Computer Networking: A Top-down approach, J. Kurose and K. Ross, 6th edition, 2013. -Computer Networks, Andrew S. Tanenbaum, 4th edition, Prentice Hall, 2002. -Selected research papers
Method of evaluation	<ul style="list-style-type: none"> 20.00% - Midterm exam 20.00% - Oral presentation 30.00% - Homework /Assignments 30.00% - Final exam

Nature of the assignments	Assignments are of a practical coding in nature. Students will be trained to conduct a networking system implementations using either MiniNet or NS-2 network simulators. The course will also include a major network implementation project component that requires performing several paper reviews and simulations.
Course Policies	All assignments, including contributions to discussion, submitted by students in the course of this class should be work written by themselves specifically for this class. Students must clearly cite and reference each and every source that was used in their development. Where students use the actual words of a source, they must put those words inside quotation marks.
Additional Information	<i>Student must obtain the passing grade (70%) in each task and the final project to pass the course.</i>

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Sun 01/22/2017 Tue 01/24/2017	Introduction to fundamental concepts in computer networks
2	Sun 01/29/2017 Tue 01/31/2017	Introduction to network & performance measurements
3	Sun 02/05/2017 Tue 02/07/2017	Transport control protocol
4	Sun 02/12/2017 Tue 02/14/2017	Congestion control
5	Sun 02/19/2017 Tue 02/21/2017	Wireless networks
6	Sun 02/26/2017 Tue 02/28/2017	Wireless mesh and sensor networks
7	Sun 03/05/2017 Tue 03/07/2017	TCP and congestion control over wireless links
8	Sun 03/12/2017 Tue 03/14/2017	Optical Networks
9	Sun 03/19/2017 Tue 03/21/2017	Optical burst and packet switching
10	Sun 03/26/2017 Tue 03/28/2017	TCP and congestion control over optical networks
11	Sun 04/02/2017 Tue 04/04/2017	Spring Break
12	Sun 04/09/2017 Tue 04/11/2017	Cloud Infrastructure
13	Sun 04/16/2017 Tue 04/18/2017	Cloud transport and congestion control
14	Sun 04/23/2017 Tue 04/25/2017	Paper oral presentations
15	Sun 04/30/2017 Tue 05/02/2017	Paper oral presentations
16	Sun 05/07/2017 Tue 05/09/2017	Final course review
17	Sun 05/14/2017 Tue 05/16/2017	
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Note

The instructor reserves the right to make changes to this syllabus as necessary.