



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	2018/2019
Semester Start Date	01/27/2019
Semester End Date	05/23/2019
Class Schedule (Days & Time)	09:00 AM - 10:30 AM Mon Tue

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Basem Shihada	basem.shihada@kaust.edu.sa	+966128080332		Tuesday 10:30-12:00PM in Building 1, Room 4252

Teaching Assistant(s)

Name	Email
Maha AlAslani	maha.aslani@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, MiniNet, 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 that will be given

Method of evaluation	10.00% - Presentation 20.00% - Midterm exam 30.00% - Homework /Assignments 30.00% - Final exam 10.00% - Attendance and Participation
Nature of the assignments	Assignments are of a practical coding in nature. Students will be trained to conduct networking system implementations using real TCP and other network modules over Linux kernel. 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	Mon 01/28/2019 Tue 01/29/2019	Introduction to fundamental concepts in computer networks
2	Mon 02/04/2019 Tue 02/05/2019	Introduction to network & performance measurements
3	Mon 02/11/2019 Tue 02/12/2019	Transport control protocol
4	Mon 02/18/2019 Tue 02/19/2019	Congestion control
5	Mon 02/25/2019 Tue 02/26/2019	Wireless networks
6	Mon 03/04/2019 Tue 03/05/2019	Wireless mesh and sensor networks
7	Mon 03/11/2019 Tue 03/12/2019	TCP and congestion control over wireless links
8	Mon 03/18/2019 Tue 03/19/2019	Optical Networks
9	Mon 03/25/2019 Tue 03/26/2019	Optical burst and packet switching
10	Mon 04/01/2019 Tue 04/02/2019	TCP and congestion control over optical networks
11	Mon 04/08/2019 Tue 04/09/2019	Spring Break
12	Mon 04/15/2019 Tue 04/16/2019	Cloud Infrastructure
13	Mon 04/22/2019 Tue 04/23/2019	Cloud transport and congestion control
14	Mon 04/29/2019 Tue 04/30/2019	Paper oral presentations
15	Mon 05/06/2019 Tue 05/07/2019	Paper oral presentations
16	Mon 05/13/2019 Tue 05/14/2019	Final course review
17	Mon 05/20/2019 Tue 05/21/2019	Final Project Presentations

Note

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