



## Course Syllabus: Computer Networks - CS 244

<b>Division</b>	Computer, Electrical and Mathematical Sciences & Engineering
<b>Course Number</b>	CS 244
<b>Course Title</b>	Computer Networks
<b>Academic Semester</b>	Spring
<b>Academic Year</b>	2017/2018
<b>Semester Start Date</b>	01/28/2018
<b>Semester End Date</b>	05/24/2018
<b>Class Schedule</b> (Days & Time)	09:00 AM - 10:30 AM   Tue Thu

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 4210

Teaching Assistant(s)	
Name	Email
Maha AlAslani	maha.aslani@kaust.edu.sa

Course Information	
<b>Comprehensive Course Description</b>	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.
<b>Course Description from Program Guide</b>	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.
<b>Goals and Objectives</b>	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.
<b>Required Knowledge</b>	Solid knowledge in computer systems, excellent skills in C/C++, network simulators such as NS-2 and 3, MiniNet, and Linux programming.
<b>Reference Texts</b>	<ul style="list-style-type: none"> <li>-Computer Networking: A Top-down approach, J. Kurose and K. Ross, 6th edition, 2013.</li> <li>-Computer Networks, Andrew S. Tanenbaum, 4th edition, Prentice Hall, 2002.</li> <li>-Selected research papers that will be given</li> </ul>

<b>Method of evaluation</b>	<b>30.00%</b> - Final exam <b>10.00%</b> - Scientific review article presentation <b>20.00%</b> - Midterm exam <b>30.00%</b> - Homework /Assignments <b>10.00%</b> - Attendance and Participation
<b>Nature of the assignments</b>	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.
<b>Course Policies</b>	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.
<b>Additional Information</b>	<b><i>Student must obtain the passing grade (70%) in each task and the final project to pass the course.</i></b>

### Tentative Course Schedule

*(Time, topic/emphasis & resources)*

Week	Lectures	Topic
1	Tue 01/30/2018 Thu 02/01/2018	Introduction to fundamental concepts in computer networks
2	Tue 02/06/2018 Thu 02/08/2018	Introduction to network & performance measurements
3	Tue 02/13/2018 Thu 02/15/2018	Transport control protocol
4	Tue 02/20/2018 Thu 02/22/2018	Congestion control
5	Tue 02/27/2018 Thu 03/01/2018	Wireless networks
6	Tue 03/06/2018 Thu 03/08/2018	Wireless mesh and sensor networks
7	Tue 03/13/2018 Thu 03/15/2018	TCP and congestion control over wireless links
8	Tue 03/20/2018 Thu 03/22/2018	Optical Networks
9	Tue 03/27/2018 Thu 03/29/2018	Optical burst and packet switching
10	Tue 04/03/2018 Thu 04/05/2018	TCP and congestion control over optical networks
11	Tue 04/10/2018 Thu 04/12/2018	Spring Break
12	Tue 04/17/2018 Thu 04/19/2018	Cloud Infrastructure
13	Tue 04/24/2018 Thu 04/26/2018	Cloud transport and congestion control
14	Tue 05/01/2018 Thu 05/03/2018	Paper oral presentations
15	Tue 05/08/2018 Thu 05/10/2018	Paper oral presentations
16	Tue 05/15/2018 Thu 05/17/2018	Final course review
17	Tue 05/22/2018 Thu 05/24/2018	Final Project Presentations
18		

#### Note

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