



University of Tehran
School of Electrical and Computer Engineering

Course	Advanced Computer Networks		
Course type, level, credit	Optional	Graduate	3 units
Field, Major	Computer Engineering	Software, Hardware, Information Technology	
Co-requisite(s)	-		
Prerequisite(s)	Graduate		
Prerequisite by topic	Basic probability, basic concepts in networking and communications.		
Goals	This graduate-level course is focused on understanding technical details in a number of areas of networking through reading and discussion of important research papers in the field, emphasizing data and computer communications and the wired and wireless networking.		
Outcome	<p>Upon successful completion of the course, students will understand foundations of:</p> <ul style="list-style-type: none"> • Internet Architecture, Transport Layer Protocols, Network Layer Protocols, Wireless Networking, Multimedia Networking, Network Performance, Network Management, Network Applications • Being able to embark leading edge researches in the field 		
Topics	<p>Review of basics of Networking</p> <p>Router Basics: including protocols, hardware, packet processing and high speed forwarding</p> <p>Routing protocols and BGP</p> <p>Multicast protocols and Multicast Routing</p> <p>Basics of Congestion Control and TCP Fundamentals</p> <p>Software Defined Networking</p>		

	<p>Performance analysis of Networks</p> <p>Wireless And Mobile Networks</p> <ul style="list-style-type: none"> • Introduction to wireless and cellular networking • Wifi (802.11) <p>Quality of Service basics and Multimedia networking</p> <p>Security</p>
Required software	Matlab, NS3, Omnet
Assignments	3 programming homework paper review (around 15 papers)
Projects	1 course project
Grading	<p>Assignments and paper readings: 30 %</p> <p>Midterm and Final exams 40 %</p> <p>Final Project 30 %</p>
Textbook(s)	<p>[1] Jim Kurose, Keith Ross, Computer Networking: A Top-Down Approach Featuring the Internet, (7th Edition, 2017), Pearson, ISBN-10: 0132856204</p> <p>[2] Larry Peterson, Bruce Davie, Computer Networks: A Systems Approach (The Morgan Kaufmann Series in Networking), (5th Edition, 2011), ISBN-10: 0123850592, http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002</p>
Further readings	<p>Articles from main conferences and journals , such as:</p> <p>ACM SIGCOMM</p> <p>IEEE INFOCOM</p> <p>IEEE/ACM Transactions on computers</p>