TOROS ÜNİVERSİTESİ

Faculty Of Engıneerıng
Computer And Software Engıneerıng

Course Information

COMPUTER NETWORKS					
Code	Semester	Theoretical	Practice	National Credit	ECTS Credit
		Hour / Week			
CSE304	Spring	3	0	3	3

Prerequisites and co-requisites	None
Language of instruction	English
Type	Required
Level of Course	Bachelor's
Lecturer	Asst. Prof. Omid Sharifi
Mode of Delivery	Face to Face
Suggested Subject	None
Professional practise (internship)	None
Objectives of the Course	Better analyze the design principles, key networking issues and solutions of the Internet. Better understand various advanced topics on computer networking. Improve your skills on identifying and solving problems in computer networking. Improve your research, writing, and presentation skills.
Contents of the Course	Introduction to fundamental concepts of computer networks. Basic performance and engineering trade-offs in the design and implementation of computer networks. Network hardware/software, protocols and layers, OSI and TCP/IP reference models. Data link layer design issues including encoding, framing, error detection, reliable delivery, and multiple access. Multiplexing, switching, and routing. LANs, wireless LANs, cellular networks. TCP/IP protocol family. Network applications. New trends in computer-communication networks.

Learning Outcomes of Course

#	Learning Outcomes
1	At the end of the course, student must be able to understand: Factors affecting network performance (bandwidth, latency, delay-bandwidth product);
2	Architectural implications of large scale networks;
3	Fundamental principles of layered network protocol architectures;
4	Functions of layers in OSI and TCP/IP protocol stacks;
5	Key networking concepts such as multiplexing, multiple access, switching, bridging, and addressing; Reliable transmission using automatic repeat request protocols (stop-and-wait and sliding window);
6	Protocols for wired/wireless medium access (CSMA/CD and CSMA/CA); Issues related to virtual circuit switching and packet switching; Addressing in IP networks, subnets, classless routing and longest prefix match;
7	Connection-oriented and connectionless services provided by TCP/IP; Application layer protocols and domain name system (DNS); Tools for evaluation of real-world network systems using high-fidelity simulation software (currently, Riverbed software).

Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Foundations (Ch. 1)	Lecture, discussion, presentation
2	Network performance (Ch. 1)	Lecture, discussion, presentation
3	Link layer services (Ch. 2)	Lecture, discussion, presentation

4	Ethernet: physical properties, multiple access (Ch. 2)	Lecture, discussion, presentation
5	Wireless technologies: Bluetooth, Wi-Fi, WiMAX, cellular (Ch. 2)	Lecture, discussion, presentation
6	Packet switching concepts, bridges and LAN switches (Ch. 3)	Lecture, discussion, presentation
7	Midterm	Exam
8	Internetworking with IP (Ch. 3)	Lecture, discussion, presentation
9	Address translation, host configuration, VPNs, IPv6 (Ch. 3)	Lecture, discussion, presentation
10	Address translation, host configuration, VPNs, IPv6 (Ch. 4)	Lecture, discussion, presentation
11	End-to-end protocols: UDP and TCP (Ch. 5)	Lecture, discussion, presentation
12	A brief overview of the application layer (Ch. 9)	Lecture, discussion, presentation
13	Review and concluding remarks	Lecture, discussion, presentation
14	Final	Exam
15		
16		

Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	L. L. Peterson and B. S. Davie, Computer Networks: A Systems Approach, 5th ed., Morgan Kaufmann, 2012.		
2	A. S. Tanenbaum, Computer Networks , 5th ed., Pearson, 2010.		

Method of Assessment

#	Weight	Work Type	Work Title
1	40%	Mid-Term Exam	Mid-Term Exam
2	60%	Final Exam	Final Exam

Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	At the end of the course, student must be able to understand: Factors affecting network performance (bandwidth, latency, delay-bandwidth product);	2,3	1,2
2	Architectural implications of large scale networks;	2,3	1,2
3	Fundamental principles of layered network protocol architectures;	2,3	1,2
4	Functions of layers in OSI and TCP/IP protocol stacks;	2,3	1,2
5	Key networking concepts such as multiplexing, multiple access, switching, bridging, and addressing; Reliable transmission using automatic repeat request protocols (stop-and-wait and sliding window);	2,3	1,2
6	Protocols for wired/wireless medium access (CSMA/CD and CSMA/CA); Issues related to virtual circuit switching and packet switching; Addressing in IP networks, subnets, classless routing and longest prefix match;	2,3	1,2
7	Connection-oriented and connectionless services provided by TCP/IP; Application layer protocols and domain name system (DNS); Tools for evaluation of real-world network systems using high-fidelity simulation software (currently, Riverbed software).	2,3	1,2

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

Work Load Details

#	Type of Work	Quantity	Time (Hour)	Work Load
1	Course Duration	14	3	42

2	Course Duration Except Class (Preliminary Study, Enhancement)	14	3	42
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	2	2
8	Midterm Exam	1	2	2
9	Quiz	0	0	0
10	Homework	0	0	0
11	Midterm Project	0	0	0
12	Midterm Exercise	0	0	0
13	Final Project	0	0	0
14	Final Exercise	0	0	0
15	Preparation for Final Exam	1	1	1
16	Final Exam	1	1	1
				90