MARMARA UNIVERSITY - FACULTY OF ENGINEERING

2017-2018 Fall

CSE4074 Computer Networks

COURSE DESCRIPTION FORM

Offering Department	Department of Computer Engineering	Undergraduate must course (7th semester)	
Course Code	CSE4074		
Course Name	Computer Networks		
Language of Instruction	English		
ECTS	5		
Contact Hours	Theoretical (T): 3	Practice (U): 0	Laboratory(L):0
Pre-requisites			
Instructor	**Name**	Ömer KORÇAK	
	E-mail	omer.korcak@marmara.edu.tr	
Course Materials	**Mandatory**	Book: J.F. Kurose and K.W. Ross, Computer Networking: A Top Down Approach, 7th edition, Pearson. Other materials and announcements related to the course are published at the course web page: http://mimoza.marmara.edu.tr/~omer.korcak/courses/CSE474.html/	
	Recommended	As a supplementary book "A.S. Tanenbaum and D.J.Wetherall, Computer Networks, 5th edition, Prentice-Hall, 2010." can be used.	
Course Objectives	To teach fundemantals of computer networks, and basic protocols and architectures in computer networks and the Internet. To upskill development of basic network applications.		
Course Content	Introduction to Computer Networks : Access networks, Network core, Network edge, packet switching, circuit switching, performance metrics, protocol layers, history of Internet. Application Layer: web, HTTP, FTP, e-mail systems, DNS, P2P applications, socket programming. Transport Layer: UDP, TCP, Reliable data transfer, congestion control. Network Layer: Data plane, control plane, datagram networks, IP, routing algorithms and protocols, broadcasting and multicasting, software defined networks. Data Link Layer: Error detection and correction, MAC protocols, Ethernet, link layer addressing and switching. Contemporary topics and problems in computer networking, environmental, health and security related effects of computer networks.		
Learning Outcomes	**LO1**	To determine and analyze causes of packet delay and loss in packet switching networks.	
	LO2	To design and develop network applications using socket programming.	
	LO3	To describe Internet structure, basic application layer protocols and basic principles behind transport-layer protocols (such as reliable data transfer, comgestion control, flow control)	
	LO4	To describe services, main protocols, problems and solutions in network and link layers	
	LO5	To use modern networking tools for investigation and analysis of network protocols.	
	LO6	To follow contemporary topics related to computer networks, to be aware of effects of networking technologies related to enviroment, health and safety.	

Program Outcomes		**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**
PO4	Ability to devise (a), select, and use (b) modern techniques and tools needed for engineering practice (1); ability to employ information technologies effectively (2).		1.a 1.b 2				
PO5	Ability to design (a) and conduct experiments, gather data (b), analyze and interpret results for investigating engineering problems (c).					b c	
PO11	Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety (a); awareness of the legal consequences of engineering solutions (b).						a
PO13	Knowledge of mathematics, basic sciences (a), computer science (b) and engineering sciences (c) required for the design and analysis of complex electrical and electronic devices, software and systems including hardware and software.	b		b	b		

Subjects (Knowledge, Skills and Behaviours), Contributions	**No**	**Week**	**Subjects**	**LO1**	**LO2**	**LO3**	**LO4**	**LO5**	**LO6**
	S1	1-2	Basic architecture of the Internet, basic terminology of networking, access networks, packet and circuit swtching techniques, protocol layers, history of the Internet.			MF			

of Subjects to Learning Outcomes,

Assessment Methods

S2	2	Network performance criteria: packet delay, loss and throughput.	MF					
S3	3	Network performance measurement tools, packet analysis tools , Wireshark.					H	
S4	3-4	Application layer: Fundamentals, web, file transfer, e-mail protocols, DNS, P2P applications, video streaming, content distribution networks.			MF			
S5	5	Socket programming		P				
S6	5-6-7	Transport Layer: Transport layer services, UDP, reliable data transfer, TCP, congestion and flow control.			MF,Q			
S7	8-9	Network layer, data plane: Routers, IP protocol, software defined networks.				MF		
S8	10-11	Network layer: Control plane: Routing algorithms and protocols, SDN control plane, ICMP, network management				MF,Q		
S9	12-13	Link layer: Services, error detection and correction, multiple access protocols, local area networks, data center networks				MF		
S10	14	Contemporary topics and problems in computer networking, environmental, health and safety related effects of computer networks.						H

Assessment Methods and Weights

No	Type	Weight	Implementation Rule	Make-up Rule
MF	Midterm, Final	70%	There will be one midterm and one final exam. In the exams, books and all course materials are closed. Any type of calculators or communication equipments are not allowed during exams.	Marmara University regulations will be followed for make-up exams.
Q	Quiz	6%	There will be one or two quizzes.	-
H	Homeworks	9%	First two homeworks are Wireshark lab homeworks. Students are asked to submit a report. Final homework is a research on environmental, health and safety related effects of computer networks.	-
P	Project	15%	It is a socket programming project. Students are asked to do a demo in the project evaluation phase.	
TOTAL		100%		

Determining Letter Grades

- The letter grades will be determined based on the midterm and final exams, quizzes and homeworks.
- In order to determine the letter grade, a curve or catalog based method will be followed based on the total average scores of the students.
- The final exam score and the total average score of the student must be at least 35 to pass the course.
- According to Marmara University Undergraduate regulations, the weight of the final exam must be at least 40 out of 100.

Assessment	Midterm	Quizzes	Homeworks	Project	Final	TOTAL
Weight	30	6	9	15	40	100

Teaching Method, Student Work Load

Time Applied by the Instructor

No	Method	Explanation	Hours
1	Lectures	Lectures are given in class using the board or via presentations. Example questions are solved to enhance the concepts.	14x3=42
2	Problem Session/ Practice	Problems related to the course topics are solved on the board.	
3	Laboratory	Experiments are done in the laboratory or theoretical concepts covered during the lectures are practiced using computer exercises.	
4	Interactive Courses	Questions are asked to students during lectures and they are encouraged to guess the answers (peer learning is also in this category)	
5	Field Work	Students attend activities outside the campus.	
6	Midterm	Midterm exam is given during the midterm week.	2
7	Final	Final exam is given during the final exam week.	2

Estimated Time to be Allocated by a Student

8	Project	The students carry out research about the problem given in the project, design and implement their solution and prepare a report.	20
9	Homeworks	The students solve the problems given as homework.	3x4=12
10	Pre-class learning of Course	The students study and learn the new subjects from course materials.	13

		Material		
	11	Review of Course Material	Students review the course subjects from course materials to prepare for the exams and homeworks.	32
	12	Office Hour	Students ask questions to the instructor or the assistant during office hours.	2
	TOTAL			125
Academic Honesty	Violations of scholastic honesty include, but are not limited to cheating, plagiarizing, fabricating information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students. In case academic dishonesty is observed, the first authority is the instructor of the course. The instructor may decide to give the student zero for the homework(s)/lab(s)/exam(s), give the letter grade FF, or may take disciplinary action.			