## **Data Communications and Computer Networks**

Course Code: CSE 471 Course Period: Autumn Course Type: Core Credits: 4 Theoric: 3 Practice: 0 Laboratory Hour: 2 ECTS: 8 Prerequisite Courses: Signals and Systems [1] Course Language: English

Course Objectives:

The aim of this course is to provide students with the latest Internet technologies knowledge and abilities to design and implement client and server side web programs using modern development environments.

Course Content:

This course introduces students to data transmission basics, multiplexing, analog and digital transmission, transmission media, computer communications architecture, data communications networks, ISO OSI reference model, switching techniques, LAN protocols, data link layer, framing, flow control, error control, sliding window protocols. Network layer services and protocols, routing, internetworking, transport services, TCP/IP protocol suite, presentation and application layers.

Course Methodology:

Öğretim Yöntemleri: 1: Anlatım, 2: Soru-Cevap, 3: Lab, 4: Örnek vaka incelemesi

Course Evaluation Methods:

Ölçme Yöntemleri: A: Sınav , B: Deney, C: Ödev, D: Proje

Course Learning Outcomes	Program Learning Outcomes	Teaching Methods	Assessment Methods
1) Basic knowledge of networking components; ability to identify and compare modern networking structures based on their speed, medium type and topology	1,6	1,2	A,C,D
2) Ability to identify and decribe urban area access network topologies (PPP, dial-up, xDSL, Cable). Also understanding of protocols, client/server model, Application layer services (telnet, FTP, DNS, HTTP, SMTP).	3,4,6	1,2,3	A,B,C,D
3) Ability to understand, analize and derive solutions for Transport layer services – Reliable and Non-reliable Data Transfer, TCP and UDP protocols.	1,6	1,2,3	A,B
4) Ability to analize and implement new IP/Network solutions using IP protocol foundations, IP addressing, routing and forwarding knowledge from the Netoworking layer.	1,6	1,2,3	B,D
5) Knowledge and ability to identify and compare Data Link Layer services, Ethernet, Token Rings, error detection and correction techniques and ARP.	1,6	1,2,3	A,B,D
6) Knowledge and ability to implement network applications using various computer programming languages and modern application development techniques.	3,4,6	1,2,3	B,D

**Teaching Methods:**1: Lecture, 2: Question-Answer, 3: Lab, 4: Case-study

Assessment Methods: A: Testing, B: Experiment, C: Homework, D: Project

### COURSE CONTENT

Week	Topics	Study Materials
1	INTRODUCTION TO COMPUTER NETWORKS	Textbook
2	APPLICATION LAYER	Textbook
3	APPLICATION LAYER: PROTOCOLS	Textbook
4	TRANSPORT LAYER: TRANSPORT SERVICES	Textbook
5	TRANSPORT LAYER: RELIABLE DATA TRANSFER	Textbook
6	TRANSPORT LAYER: TRANSPORT PROTOCOLS	Textbook
7	MIDTERM EXAM I	Textbook
8	NETWORK LAYER: ADDRESSING	Textbook
9	NETWORK LAYER: ROUTING & FORWARDING	Textbook
10	DATA LINK LAYER: SERVICES	Textbook
11	DATA LINK LAYER: ERROR CHECKING AND CORRECTION	Textbook
12	DATA LINK LAYER: MAC	Textbook
13	MIDTERM EXAM II	Textbook
14	PHYSICAL LAYER	Textbook

#### **RECOMMENDED SOURCES**

Textbook	Lecture Notes: <u>http://coadsys.yeditepe.edu.tr</u> [2] Lab material: <u>http://coadsys.yeditepe.edu.tr</u> [2]
Additional Resources	COMPUTER NETWORKING, BY J. F. KUROSE & K.W. ROSS (6TH EDITION) COMPUTER NETWORKS, BY ANDREW S. TANENBAUM (5TH EDITION)

### MATERIAL SHARING

**Documents** <u>http://coadsys.yeditepe.edu.tr</u> [3]

Assignments <u>http://coadsys.yeditepe.edu.tr</u> [3]

Exams

#### ASSESSMENT

IN-T	ERM STUDIES	NUMBE	R	PE	RC	EN.	TAGE
Mid	-terms	2		47			
Ass	ignment	5		15			
Lab	Work	14		15			
Terr	n Project	1		23			
Tota	al			10	0		
COI OVE	NTRIBUTION OF FINAL EXAMINATION TO ERALL GRADE			35			
COI GR/	NTRIBUTION OF IN-TERM STUDIES TO OVERALL ADE			65			
Tota	al			10	0		
CO	JRSE'S CONTRIBUTION TO PROGRAM						
No	Program Learning Outcomes		Сс	ontri	but	ion	
			1	2	3	4	5
1	Adequate knowledge in mathematics, science and engineering subjects pertaining to the relevant discipli ability to use theoretical and applied information in the areas to model and solve engineering problems.	ine; ese					X
2	Ability to identify, formulate, and solve complex engine problems; ability to select and apply proper analysis a modeling methods for this purpose.	eering Ind					
3	Ability to design a complex system, process, device o product under realistic constraints and conditions, in s way as to meet the desired result; ability to apply mod design methods for this purpose.	r such a lern					X
4	Ability to devise, select, and use modern techniques a tools needed for engineering practice; ability to emploinformation technologies effectively.	and Y					X

5 Ability to design and conduct experiments, gather data, analyze and interpret results for investigating engineering problems.

- 6 Ability to work efficiently in intra-disciplinary and multidisciplinary teams; ability to work individually.
- 7 Ability to communicate effectively both orally and in writing; knowledge of a minimum of one foreign language.
- 8 Recognition of the need for lifelong learning; ability to access information, to follow developments in science and technology, and to continue to educate him/herself.
- 9 Awareness of professional and ethical responsibility.
- 10 Information about business life practices such as project management, risk management, and change management; awareness of entrepreneurship, innovation, and sustainable development.
- 11 Knowledge about contemporary issues and the global and societal effects of engineering practices on health, environment, and safety; awareness of the legal consequences of engineering solutions.

# ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	Quantity	Duration (Hour)	Total Workload (Hour)
Course Duration (Excluding the exam weeks: 12x Total course hours)	12	5	60
Hours for off-the-classroom study (Pre-study, practice)	14	4	56
Midterm examination	2	1,5	3
Homework	5	4	20
Project	1	60	60
Final examination	1	1,5	1,5
Total Work Load			200,5
Total Work Load / 25 (h)			8,02
ECTS Credit of the Course			8

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