COURSE PROFILE

Course Name	Code	Semester	Term	Theory+PS+Lab (hour/week)	Local Credits	ECTS
Fundamentals of Computer Networks	IT205	Fall	3	4 + 0 + 0	4	8

Prerequisites	None

Course Language	English
Course Type	Required
Course Lecturer	Assist. Prof. Dr. Cüneyt Sevgi
Course Assistant	Tayfun Yalçınkaya
Course Objectives	• Understanding basic concepts of data transmission, overview of networks, OSI model description, circuit switching, packet switching, communication techniques, data link layer, flow control and error recovery, network layer, local area networks, and subnetting. • Troubleshooting the problems in a small-scaled organization. • Creating a simple network, configure and test it.
Course Learning Outcomes	After successfully completing the course, the student will be able to: • understand basic concepts of data transmission, overview of networks, OSI model description, circuit switching, packet switching, communication techniques, data link layer, flow control and error recovery, network layer, local area networks, and subnetting. • troubleshoot the problems in a small-scaled organization • create a simple network, configure and test it.
Course Content	Introduction to computer networks. LANs, WANs and Internetworks. Protocols and Layered models. The Open System Interconnection (OSI) model. TCP/IP model. Application Layer Protocols and services: DNS, www, e-mail, FTP, DHCP, P2P, Telnet. OSI Transport Layer: TCP and UDP protocols. OSI Network Layer: IPv4 protocol and addressing: Special addresses, subnetting. Routing. Data-Link Layer: Media access control techniques. MAC addressing and framing. Ethernet protocol concepts and types. OSI Physical Layer: Signalling and encoding. Physical media. Planning and cabling networks. Basic network configuration and testing.

COURSE CONTENT

Week	Subjects	Related
1	Introduction to Computer Networking Demonstration of Online Lecture Notes. Living in a Network Centric World: Where, when and how do we use networks. Elements of a network. The Architecture of the Internet. Trends in Networking.	Ch.1
2	Ch.2 - Communicating over the network: The Platform for Communications. LANs. WANs, Internetworks. Protocols and layered Models (TCP/IP, OSI). Network Addressing.	Ch.2
3	Ch.3 - Application Layer Functionality and Protocols: Application layer software and services. Client-Server model. P2P networking. DNS, WWW, e-mail, FTP, DHCP, Telnet.	Ch.3
4	Ch.4 - OSI Transport Layer: TCP Protocol. Connection establishment and termination, 3-way handshake. Managing TCP sessions, acknowledgements and windowing. UDP Protocol.	Ch.4
5	Ch.4 - OSI Transport Layer: TCP Protocol. Connection establishment and termination, 3-way handshake. Managing TCP sessions, acknowledgements and windowing. UDP Protocol.	Ch.4
6	Ch.5 - OSI Network Layer: IPv4 Protocol. IPv4 packet and header. Dividing hosts into groups. Hierarchical addressing. Routing (static, dynamic). Routing protocols.	Ch.5
7	Ch.5 - OSI Network Layer: IPv4 Protocol. IPv4 packet and header. Dividing hosts into groups. Hierarchical addressing. Routing (static, dynamic). Routing protocols.	Ch.5
8	Ch.5 - OSI Network Layer: IPv4 Protocol. IPv4 packet and header. Dividing hosts into groups. Hierarchical addressing. Routing (static, dynamic). Routing protocols. Ch.6 - Addressing the network - IPv4: IPv4 Addresses. Binary to decimal, decimal to binary number conversions. Types of addresses, unicast, multicast, broadcast addresses. Special addresses. Public and private addresses. Assigning IP addresses. Subnet masks, VLSM.	Ch.5 - Ch.6
9	Ch.6 - Addressing the network - IPv4: IPv4 Addresses. Binary to decimal, decimal to binary number conversions. Types of addresses, unicast, multicast, broadcast addresses. Special addresses. Public and private addresses. Assigning IP addresses. Subnet masks, VLSM.	Ch.6
10	Ch.7 - Data-Link Layer: Accessing the media. Creating a frame. Media Access Control for shared media, non-shared media. Logical vs. physical topology. MAC addressing and framing.	Ch.7
11	Ch.8 - OSI Physical Layer: Physical layer purpose, operation and standards. Physical signaling and encoding, representing bits. Physical media: copper, UTP, fiber, wireless.	Ch.8

12	Ch.9 – Ethernet: Standards and implementation. LLC and MAC. Ethernet collision management. CSMA/CD. Ethernet frames. MAC addressing. Ethernet timing and inter-frame spacing. Hubs vs. switches. ARP: Address Resolution Protocol.	Ch.9
13	Ch.9 – Ethernet: Standards and implementation. LLC and MAC. Ethernet collision management. CSMA/CD. Ethernet frames. MAC addressing. Ethernet timing and inter-frame spacing. Hubs vs. switches. ARP: Address Resolution Protocol.	Ch.9
14	Ch.10 - Planning and Cabling Networks: Choosing the appropriate LAN device. Making LAN and WAN connections. Developing an addressing scheme. Device interconnections.	Ch.10

Course Textbook	CCNA Online Lecture Notes.
Recommended References	Computer Networking: A Top-Down Approach. 5th Edition James F. Kurose, Keith W. Ross

Semester Requirements	**Number**	**Percentage of Grade**
Attendance/Participation		
Laboratory		
Application		
Special Course Internship (Work Placement)		
Quizzes/Studio Critics	10	0
Homework Assignments	5	10
Presentation		
Project		
Seminar/Workshop		
Midterms/Oral Exams	2	55
Final/Resit Exam	1	35
Total		100

PERCENTAGE OF SEMESTER WORK		65
PERCENTAGE OF FINAL WORK		35
Total		100

Course Category	Core Courses	X
	Major Area Courses	
	Supportive Courses	
	Media and Management Skills Courses	
	Transferable Skill Courses	

COURSE'S CONTRIBUTION TO PROGRAM

#	**Program Qualifications / Outcomes**	*** Level of Contribution**				
		1	2	3	4	5
1	A foundation in mathematics and basic sciences and ability to apply acquired knowledge as they relate to the study and practice of information technology				X	
2	An ability to analyze a problem, identify and define the computing requirements appropriate to its solution, to understand, select and use appropriate technology, tools, standards, protocols, building blocks, and components to solve the problem					X
3	An ability to propose, analyze, design, develop, test and maintain an information technology system including software solutions, security model, computer and network infrastructure, information systems etc. to solve information technology problems			X		
4	An ability to analyze local and global impact of computing on individuals, organizations and society; and the ability to apply information technology techniques, skills, and tools for regular computing practices as well as to improve effectiveness of current methodologies			X		
5	An ability to effectively communicate in oral and written media with all kinds of related audiences; and prepare documentation for this purpose as required	X				
6	An understanding of professional, ethical, legal, and social issues and responsibilities of information technology profession	X				
7	A taste and breadth of knowledge across several social topics outside the immediate requirements of the information technology profession, and the ability to work within heterogeneous teams to accomplish a common goal including people from the information technology area as well as other disciplines			X		
8	An ability to engage in life-long learning and professional development for personal improvement to follow contemporary information technology issues			X		

*1 Lowest, 2 Low, 3 Average, 4 High, 5 Highest

ECTS ALLOCATED BASED ON STUDENT WORKLOAD BY THE COURSE DESCRIPTION

Activities	**Number**	**Duration (Hours)**	**Total Workload**
Course Hours (Including Exams)	14	3	42
Tutorials	10	2	20
Laboratory			
Application	2	5	10
Special Course Internship (Work Placement)			
Field Work	10	3	30
Study Hours Out of Class	14	2	28
Presentations / Seminar			
Project			
Preparatory reading	14	2	28
Homework Assignments	5	3	15
Quizzes	10	2	20
Midterm Exams	2	2	4
Final / Resit Exam	1	3	3
		Total Workload	200

COURSE CATEGORY

ISCED GENERAL AREA CODES	GENERAL AREAS	ISCED BASIC AREA CODES	BASIC EDUCATIONAL AREAS	
1	Education	14	Teacher Training and Educational Sciences	
2	Humanities and Art	21	Art	
2	Humanities and Art	22	Humanities	
3	Social Sciences, Management and Law	31	Social and Behavioural Sciences	
3	Social Sciences, Management and Law	32	Journalism and Informatics	
3	Social Sciences, Management and Law	38	Law	
4	Science	42	Life Sciences	
4	Science	44	Natural Sciences	
4	Science	46	Mathematics and Statistics	20
4	Science	48	Computer	45
5	Engineering, Manufacturing and Civil	52	Engineering	35
5	Engineering, Manufacturing and Civil	54	Manufacturing and Processing	
5	Engineering, Manufacturing and Civil	58	Architecture and Structure	
6	Agriculture	62	Agriculture, Forestry, Livestock, Fishery	
6	Agriculture	64	Veterinary	
7	Medicine and Welfare	72	Medical	
7	Medicine and Welfare	76	Social Services	
8	Service	81	Personal Services	
8	Service	84	Transport Services	
8	Service	85	Environment Protection	
8	Service	86	Security Services	