



Faculty of Eng. & Natural Sci.

EE414-202001

Multimedia Communication

Instructor(s)

Name	Email	Office	Phone	Web	Office Hours
Özgür Erçetin	oercetin@sabanciuniv.edu	FENS-1111	9608	http://people.sabanciuniv.edu/~oercetin/	Every Wednesday between 12-2pm, or by appointment.

Course Content

Data transmission and encoding. Error detection techniques. Automatic repeat request (ARQ) protocols. Medium access control techniques: Aloha, CSMA/CD, GSM, Token Ring, FDDI, Network control stability. High-speed gigabit networks. ATM. Performance evaluation and monitoring M/M/1 Queues and networks of Queues.

Objectives

To introduce students with communication networks and networking technologies, performance analysis of networks, multimedia traffic and networking.

Recommend or Required Reading

Textbook

James F. Kurose and Keith W. Ross, Computer Networking: A Top-Down Approach Featuring the Internet, Addison Wesley
<https://www.homerbooks.com/urun/computer-networking-a-top-down-approach>

Readings

Alberto Leon-Garcia, Indra Widjaja, Communication Networks, MCGraw Hill
Dimitri Berstekas, Robert Gallager, Data Networks, Prentice Hall

Assessment Methods and Criteria

	Percentage(%)	Number of assessment methods
Exam	70	7
Group Project	20	
Homework	10	

Course Outline

Introduction
Networking basics, Reference models, Layering concept
Application Layer
Principles of Network Applications, Web & HTTP, Electronic Mail, Peer-to-peer Applications
Transport Layer
Connectionless Transport (UDP), Principles of Reliable Data Transfer, Connection Oriented Transport (TCP), Principles of Congestion Control, TCP Congestion Control
Network Layer: Data Plane
What's Inside A Router? The Internet Protocol, IPv4, IPv6
Network Layer: Control Plane
Routing Algorithms, Routing in the Internet, Software Defined Networks
The Link Layer and Local Area Networks
Error Detection Techniques, Multiple Access Protocols, Ethernet, WiFi: 802.11 LANs, Link Layer Switches
Multimedia Networking
Multimedia Applications, Protocols for Real-Time Services, Traffic Management
Network Performance Analysis
Traffic characterization, basic queueing models, examples from network queueing problems

Learning Outcomes

By the end of this course, students should be able to:
Describe the operation of existing network technologies
Construct applications or interfaces to work with existing network technologies
Propose networking solutions at all layers
Build models for analyzing network algorithms/protocols
Build simulation models for analyzing the performance of network algorithms/protocols, architectures, deployments, etc.
Use network simulation tools
Record and interpret the results of simulation experiments
Adopt a systematic approach to understand network problems
Improve programming skills by building models in simulation tools

Improve team working skills via course project

Course Policies

The prerequisite is specified as CS201. Background in probability is a plus.

We will have bi-weekly single question (with several parts) multiple choice exam. In total there will be 7 exams during lecture hours. The duration of the exam will be 15-30 minutes depending on the difficulty of exam question.

There will be 2-3 programming assignments on Netsim simulation environment and Wireshark. The assignments can be completed as a group.

We will have bi-weekly homework assignments on the subject of the exam that will take place the subsequent week.