Faculty of Eng. & Natural Sci.
EE414-202201
Multimedia Communication

Instructor(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>Email</th>
<th>Office</th>
<th>Phone</th>
<th>Web</th>
<th>Office Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Özgür Erçetin</td>
<td><a href="mailto:oercetin@sabanciuniv.edu">oercetin@sabanciuniv.edu</a></td>
<td>FENS-1111</td>
<td>9608</td>
<td><a href="http://people.sabanciuniv.edu/~oercetin/">http://people.sabanciuniv.edu/~oercetin/</a></td>
<td>Monday 4.40pm-5.30pm</td>
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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 of M/M/1 Queues and Networks of Queues.

Objectives

To introduce students to 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 Bertsekas, Robert Gallager, Data Networks, Prentice Hall

Assessment Methods and Criteria

<table>
<thead>
<tr>
<th></th>
<th>Percentage(%)</th>
<th>Number of assessment methods</th>
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<tbody>
<tr>
<td>Final</td>
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<td>Midterm</td>
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<tr>
<td>Exam</td>
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<tr>
<td>Assignment</td>
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<td>6</td>
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<tr>
<td>Individual Project</td>
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<td>3</td>
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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 queuing 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 understanding network problems
Improve programming skills by building models in simulation tools
Improve team working skills via course project

Course Policies

The prerequisite is CS201. However, proficiency in MATH 203 is more important.

There will be three programming assignments from your book. We will have bi-weekly homework assignments.