CENG435 DATA COMMUNICATIONS AND NETWORKING
Tentative Syllabus, 2023-2024 Fall

Instructor: Ertan Onur, eronur@metu.edu.tr, 5534, B211
Office Hour: Wednesdays 14:40-15:30 and by appointment
Assistants:
- Feyza Yavuz
- Yiğit Sever

Schedule:
- Section 1: Wednesdays, BMB1, 10:40-12:30 and Fridays, BMB1, 11:40-12:30
- Section 2: Wednesdays, BMB1, 15:40-17:30 and Fridays, BMB1, 13:40-14:30

Communication: http://odtuclass.metu.edu.tr (CENG 435 ALL SECTIONS)

Catalog Description: Introduction to data communications. OSI Reference model. Physical Layer. Electrical interface and data transmission. Data link layer. Media access sublayer. LAN/MAN Technologies. Network layer. Internetworking. Bridging and routing. Transport layer. Introduction to upper layers' issues.

Course Objectives: At the end of this course, you will be able to:
1. Understand the basic principles of communication protocols in the context of the Internet.
2. Explain the operation and architecture of the Internet including the software and hardware components to provide Internet services.
3. Compare and contrast various application layer protocols such as HTTP, SMTP, DNS; connection-oriented communication protocols such as TCP and connectionless communication protocols such as UDP at transport layer; virtual-circuit and packet switching at network layer; link-state and distance-vector routing at network layer; and multiple access techniques at link layer.
4. Devise protocols for reliable data transfer over unreliable channels, congestion control or flow control either in the user or kernel space of operating systems at the transport layer.
5. Design and implement networking protocols at any layer of the OSI communication stack above the physical layer using socket programming interface.

Textbook:
- Kurose, J.F. and Ross, K.W., Computer Networking: A Top Down Approach, 8th Ed., Pearson Education, 2021.

References:
- Tanenbaum, A.S., Computer Networks, 5th Ed., Prentice Hall, 2011.
- Stallings, W., Data and Computer Communications, 9th Ed., Prentice Hall, 2010.

Prerequisites: Mastering a programming language and knowledge on operating systems are required.

Grading: Catalog grading will be employed.

Midterm Exam	16%
Final	35%
Online Quizzes	6 x 2%
Wireshark Assignments (WSA)	8 × 3%
Socket Programming Assignment	1 × 13%

Final exam entrance condition: To be allowed to take the final exam, you MUST collect at least 25 points from course activities (quizzes, wireshark assignments (WSA) and socket programming assignment)

Makeup policy: A makeup exam is possible only if a legally documented excuse (e.g., medical report approved by METU Medical enter) is provided.

Assignments: The programming assignments/projects must be well documented and complete with test runs conforming to software engineering principles. Any work you submit must be your own.

Late delivery: Late submission is not allowed.

Academic honesty: There will be no tolerance to cheating in the exam, to plagiarism (copying someone else's work as if it is yours) and to taking advantage in group assignments and projects. The student who cheats will fail the course and be punished according to METU regulations.

Tentative Course Outline:

Week	Topic	Reading	Activities
1	Courseware, Introduction	Chapter 1	
2	Introduction	Chapter 1	WSA1 (Getting started)
3	Application Layer	Chapter 2	WSA2 (HTTP), Quiz1
4	Application Layer	Chapter 2	
5	Transport Layer	Chapter 3	WSA3 (TCP), Quiz2
6	Transport Layer	Chapter 3	WSA4 (UDP), Prog. Assignment OUT
7	Transport Layer	Chapter 3	Quiz3
8	Network Layer, Data Plane	Chapter 4	Midterm
9	Network Layer, Data Plane	Chapter 4	WSA5 (IP), Quiz4
10	Network Layer, Control Plane	Chapter 5	WSA6 (ICMP)
11	Network Layer, Control Plane	Chapter 5	Quiz5
12	Link Layer	Chapter 6	Prog. Assignment IN
13	Link Layer	Chapter 6	WSA7 (Ethernet), Quiz6
14	Wireless Mobile Networks	Chapter 7	WSA8 (802.11)