CENG435 DATA COMM. AND NETWORKING
Tentative Syllabus, 2024-2025 Fall

Instructor: Ertan Onur, eronur@metu.edu.tr, 5534, B211
Office Hour: Thursdays 11:00-12:00 and by appointment
Assistants: Feyza Yavuz, Furkan Murat
Schedule:
- Section 1: Wednesdays, BMB1, 10:40-12:30 and Thursdays, BMB1, 12:40-12:30
- Section 2: Thursdays, BMB1, 13:40-15:30 and Wednesdays, BMB3, 12:40-13:30

Communication: http://odtuclass.metu.edu.tr (CENG 435 All Sections) I do not and will not follow COW discussions, please use ODTUCLASS for any communication.
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 OPSYS are required.
Grading: **Catalog grading will be employed.**

Midterm exam	30%
Final	40%
Programming assignment (2 deliverables)	30%
Online quizzes for each chapter	Pass/Fail
Bonus	5%

Bonus: If you invent a new network covert channel in the programming assignment, you will be eligible to get the bonus points as long as the proposal is novel.
Online quizzes: You will have a quiz for each chapter we cover in the course. The quizzes will be graded out of 15. You will get 15 random questions in each quiz. The default grading of moodle will be applied. To pass a quiz, you have to score at least 7 out of 15. You can attempt a quiz any time and any number of times. If you take the same quiz multiple times, the highest grade will be considered. The quiz questions may pop up in exams.
Final exam entrance condition: One should pass at least 5 online quizzes to be able to take the final exam.

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 assignment must be well documented and complete with test runs conforming to software engineering principles. Any work you submit must be your own. ChatGPT is allowed as long as the documentation and the code belong to yourselves.

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.

Course conduct: We will employ flipped classroom technique. You will watch the video lectures on Odtuclass before coming to the lectures. Weekly schedule is given below. I will answer your questions and run brainstorming sessions on the topic.

Tentative Course Outline:

Week	Topic	Reading	Activities
1	Courseware, Introduction	Chapter 1	
2	Introduction (1.1-1.7)	Chapter 1	
3	Application Layer (2.1-2.4)	Chapter 2	
4	Application Layer (2.5-2.7)	Chapter 2	PA OUT
5	Transport Layer (3.1-3.4)	Chapter 3	
6	Transport Layer (3.5)	Chapter 3	PA IN (First Deadline)
7	Transport Layer (3.6-3.9)	Chapter 3	
8	Network Layer, Data Plane (4.1-4.3)	Chapter 4	Midterm
9	Network Layer, Data Plane (4.4-4.5)	Chapter 4	
10	Network Layer, Control Plane (5.1-5.3)	Chapter 5	
11	Network Layer, Control Plane (5.4)	Chapter 5	
12	Network Layer, Control Plane (5.5-5.6)	Chapter 5	
13	Link Layer (6.1-6.3)	Chapter 6	PA IN (Final Deadline)
14	Link Layer (6.4-6.7)	Chapter 6	