

Tentative Syllabus
CENG513 Wireless Communications and Networks
2018-2019 Spring

Instructor: Ertan Onur, eronur@metu.edu.tr, 5534, B211

Office Hours: Mondays 11:30-12:00 and by appointment (please send me an email).

Logistics: Tuesdays, BMB5, 13:40-16:30

Catalog Description: Introduction to transmission and networks. Antennas, multipath propagation, frequency hopping. Satellite communication. Overview of current systems for cellular for networks, wireless LANs, mobile IP, Ad Hoc networks, the Bluetooth technology and the IEEE802.11 standard.

Course Objectives: By the end of the course, you will be able to

o1: describe the fundamental concepts of wireless transmission,

o2: apply cellular planning concepts to real-life mobile network design problems,

o3: compare and contrast centralized and distributed approaches in wireless networks,

o4: evaluate and devise various medium access control and routing protocols and **justify** applicability of those protocols in various network design challenges,

o5: infer and solve specific challenges of wireless communication in the realm of internetworking, specifically related to network and transport layers.

Communication: Moodle at <https://odtuclass.metu.edu.tr>

Textbook (TB): C. Beard and W. Stallings, Wireless Communication Networks and Systems, 1st Ed., Pearson 2016.

Supplemental Books:

SB1: J. Schiller, Mobile Communications, 2nd Ed., Addison Wesley, 2003.

SB2: Kurose, J.F. and Ross, K.W., Computer Networking, 6th Ed., Pearson, 2012

Prerequisites: CENG435 Data Communications and Networking, EE444 Introduction to Computer Networks or similar courses. Undergrads can take the course if they have already taken CENG435 and scored AA. Programming experience in C or python is compulsory.

Grading:

Term project (details on odtuclass)	50%
Paper Critique	4 × 5%
Final	30%

NA Grade: Those who do not deliver an acceptable project or who do deliver at least two paper critiques, will not be able to take the final exam.

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

Course Outline:

Week	Topic	TB Chapter
1	Courseware, background, history, applications, trends, challenges, reference model, classification of wireless systems	1
2-3	Physical layer: Physical layer aspects, signals, antennas, propagation, multiplexing, capacity, modulation, error control	2, 5, 6, 7, 8, 9, 10
4	Link layer: Medium access control, hidden/exposed terminals, near-far terminals, MACA, MACAW, CSMA	Slides
5-6	Ad hoc networks: modeling, challenges, MAC protocols, routing (DSR, OLSR, AODV)	Slides
7-8	Mobile networks: Cellular concept, GSM, UMTS, LTE	13, 14
9-10	Performance evaluation : Markov chains, birth-death processes, basic queueing theory	Notes
11-12	Wireless local and personal area networks: IEEE 802.11, Bluetooth, Zigbee	11
13-14	Student presentations	