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Sabancı University

Faculty of Engineering and Natural Sciences

EE 410/654 - Information and Coding Theory

Spring 2023-2024

Course Information

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Lecturer	: Hüseyin Özkan, `huseyin.ozkan@sabanciuniv.edu`
	Room: FENS 1107, Phone: x9594.
Teaching Assistant	: Can Aksoy, `aksoycan@sabanciuniv.edu`
Textbook	: Elements of Information Theory, 2nd edition, Thomas M. Cover, Joy A. Thomas, 2006.
Lecture Hours	: Tuesday 08:40-10:30 (FENS L035), Thursday 12:40-13:30 (FASS 2023).
Office Hours (Online)	: Hüseyin Özkan: By appointment, please drop an email to arrange one.
Course Objectives	: To provide students fundamentals of information and coding theory and enable them to develop the background for graduate level studies. To provide students knowledge of practical algorithms regarding compression and communication.
Prerequisite	: Probability and Linear Algebra
Grading Policy	: 2 Midterms, 2x30%; Final, 30%; Attendance, 10%.

Topics (tentative):

- Entropy, relative entropy, mutual information

- Asymptotic equipartition property

- Entropy rate of a stochastic process

- Source coding: Optimal codes, Kraft inequality, Huffman codes, Fano coding, Shannon-Fano-Elias coding, arithmetic coding

- Channel capacity, and channel coding theorem

- Linear codes, Hamming, LDPC and Convolutional codes

- Differential entropy, and Gaussian channel

- Rate-distortion theory: basics and intuition (This will be covered only if time permits).

Exams are physical on campus.
There will be two midterms and a final. Both are closed-book and closed-notes and no electronics devices.

Attendance will be taken regularly.

Problem Sets
There will be (roughly) 4-6 homework assignments. These assignments will not be graded. Hence, you are not required to submit your answers. Exams may include similar problems. You are strongly recommended to study and solve all the assignments thoroughly.

Make-up Policy
There will only be one make-up exam at the end of the semester. Only health or other personal emergencies will be accepted as valid reasons to qualify you for a make-up exam. The make-up exam will cover the entire course material.

SUCourse
We will use SUCourse to distribute problem sets and their solutions, and as a communication medium between you and the staff. If you have any problems accessing the course material on SUCourse, please let us know as soon as possible so we can have such problems fixed.