Instructor: Assoc. Prof. Dr. Taylan Akdoğan

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Phone: 7083

Office: KB 331K

Course assistant: Sinal Ural (vedat.ural@boun.edu.tr)

Office hours: 1) A fixed time will be announced after the semester begins. 2) By appointment. 3) You can also stop by my office without an appointment; I will see you if I am not in hurry.

Course schedule: MMWW 5656 in KB316

Course page: “http://alum.mit.edu/www/akdogan”. Problem sets, exams, and general course information will be found here.

About the course: This is a course intended for freshmen of science and engineering departments. The course starts with the introduction of bits and codes. Then, information theory is explored further. The relation between the information theory and physical systems will conclude the course. The course will include homework assignments, two midterm examinations, and a final. Subjects to be covered:

- Bits and codes
- Compression
- Noise and errors
- Probability
- Communications
- Processes
- Inference
- Maximum entropy principle
- Physical systems
- Energy and temperature

Prerequisites: Consent of instructor. It is recommended that the prospected students had completed PHYS 101 and MATH 101, and completed PHYS 102/130 or taking PHYS 102/130 in parallel to this course. However, those who did not complete these can also register for the course with the consent of the instructor.
**Required text:** “*Information and Entropy: Introduction Lectures*” provided by open courseware of Massachusetts Institute of Technology.


**Attendance:** I expect you to come to class regularly and on time. You should be prepared to discuss the textbook material and to have worked on the assigned homework problems. I reserve the right to adjust your final course score up or down by a grade step based on the quality and extent of your contributions.

**Homework:** This will be a significant part of the learning process for this class. They will be handed out on Wednesday, and will be due on the next Wednesday at 13:00. Please staple the pages securely and leave them on my desk when you enter the classroom (i.e., do not work on the problem set during the class). The solutions will be discussed briefly during the problem sessions. No homework will be accepted once the solutions are given. Late homework can be accepted without penalty only if you have a valid excuse and the solutions are not discussed.

I encourage you to work collaboratively on the problems but you should understand that when you write up solutions the work is to be your own (i.e., do not just copy someone’s solution). Do not be shy about coming to me or course assistants for help with the homework.

**Exams:** There will be two 50-minute midterms, and a 90-minute final exam. All exams will be closed book/closed notes. Calculators are neither needed nor allowed. You can prepare a cheat-sheet of size A4 to be used during the exams, but you cannot share it with your friends.

**Grading:** The weights that will determine the cumulative grade are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Contribution</th>
</tr>
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<tbody>
<tr>
<td>Homework</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm I</td>
<td>20%</td>
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<tr>
<td>Midterm II</td>
<td>20%</td>
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<tr>
<td>Final</td>
<td>40%</td>
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</tbody>
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The final grades will be determined according to the distribution of cumulative grades and the classroom contributions.