BOĞAZİÇİ UNIVERSITY - PHYSICS DEPT.
SYLLABUS
PHYS 312
Modern Physics II (3 Cr)

Instructor: Erhan Gülmez gulmez@bogazici.edu.tr

Office Hours: on appointment
Course Description: The aim of the course is to introduce the students to the structure of atoms, molecules and nuclei, radioactivity and nuclear reactions, elementary particles, solid-state physics, astrophysics and cosmology. Emphasis on understanding physics of quantal phenomena and on order of magnitude estimates rather than formalism.
Prerequisite: PHYS 311.

Suggested textbooks:
Modern Physics from α to Z^0, J. W. Rohlf, John Wiley and Sons, 1994.
Modern Physics for Scientists and Engineers, S.T. Thornton and A. Rex, Brooks/Cole Cengage Learning, 2013.
Modern Physics, K. Krane, John Wiley and Sons, 1983.
Homework: A set of suggested problems from "Modern Physics for Scientists and Engineers, S.T. Thornton and A. Rex" below. I will not collect it, but there will be a midterm on these problems.

8.3, 8.6, 8.7, 8.9, 8.13, 8.15, 8.16, 8.18, 8.22, 8.23, 8.38, 8.39, 8.40, 8.41

9.1, 9.7, 9.8, 9.19, 9.21, 9.22, 9.29, 9.39, 9.43, 9.45, 9.49, 9.53, 9.57,

10.8, 10.10, 10.18, 10.60, 10.62, 11.18, 11.22, 11.26

12.2, 12.4, 12.5, 12.9, 12.11, 12.13, 12.15, 12.18, 12.20, 12.21, 12.23, 12.26, 12.29, 12.30, 12.32, 12.34, 12.39, 12.40, 12.45, 12.47, 12.48, 12.58, 12.62, 12.65, 12.69,

13.1, 13.2, 13.5, 13.6, 13.8, 13.10, 13.14, 13.15, 13.18, 13.19, 13.21, 13.23, 13.24, 13.41, 13.57,

14.1, 14.2, 14.3, 14.5, 14.10, 14.12, 14.13, 14.14, 14.16, 14.17, 14.18, 14.19, 14.28, 14.29, 14.30, 14.31, 14.33, 14.37, 14.38, 14.41, 14.42, 14.44, 14.45, 14.46, 14.47, 14.48, 14.49, 14.51, 14.52, 14.53, 14.54, 14.55

15.2, 15.3, 15.10, 15.27, 16.6, 16.27, 16.36

Exams: There will be one midterm exam based on the HW problems above and a final exam. All exams will be closed book/closed notes. Tentative date for the midterm exam will be on July 30th, 2026.

Make-up exams: There will be no make-up exam (both for midterm and final) during the summer term, due to time constraints. Thus, I strongly recommend you to be present for all the exams.

Grading will be based on the sum of the midterm (50%) and final exam (50%).