



The Hebrew University of Jerusalem

Syllabus

General Phys.- Waves & Elec. for Chem.& Earth stu. - 77131

Last update 04-08-2022

HU Credits: 7

Degree/Cycle: 1st degree (Bachelor)

Responsible Department: Physics

Academic year: 0

Semester: 2nd Semester

Teaching Languages: Hebrew

Campus: E. Safra

Course/Module Coordinator: Dr. Shay Heizler

Coordinator Email: shay.heizler@mail.huji.ac.il

Coordinator Office Hours: Monday, 10:00-12:00, better call before, even in different hours and/or days.

Teaching Staff:

Dr. Shay Highzler,
Mr. Omry Ginzburg,
Mr. eyal atias

Course/Module description:

The course presents the classic physical foundations of electricity and magnetism, as well as the foundations for waves theory and basic optics.

The course opens with presenting the basic notations that have been used in electric theory (electrostatics), etc., the electric charge, electric field and electric potential, dielectric and conduction materials. The basic laws for the electric field and the potential are introduced, along presenting many quantitative examples. In the second part of the course, we proceed to electrical “dynamics”, i.e. calculating electrical currents and electrical circuits (simple and complex).

The third part of the course will focus in magnetism theory. We present the basic notations as the magnetic field, the Lorentz magnetic force, magnetic flux and para/ferromagnetism. Next, the electromagnetic induction phenomena is presented, showing the revolutionary fact (at that time) that time-dependent magnetic field induces electric field. We present the calculation of AC electric circuits, using the magnetic induction principle and the inductor.

The last part of the course focus in basic notations and phenomena in waves theory, first in mechanical waves such as waves in strings, sea and in electromagnetic waves as well. Some basic principles of both geometrical and physical optics will be presented, modeling the wave behavior of light.

In the absence of explicit lab hours in this course, the different physical phenomena will be demonstrated during the lectures by a series of demonstrations/experiments.

Course/Module aims:

see Course/Module description.

Learning outcomes - On successful completion of this module, students should be able to:

see Course/Module description.

Attendance requirements(%):

0

Teaching arrangement and method of instruction: Lectures, Exercises, and demonstrations during the lectures.

Course/Module Content:

see Course/Module description.

Required Reading:

Lecture notes of the lecturer.

Additional Reading Material:

Halliday, Resnick, Walker, Fundamentals of Physics.

Physics, electricity and magnetism (in hebrew), Yoram Eshel.

Physics, waves and optics (in hebrew), Yoram Eshel.

Course/Module evaluation:

End of year written/oral examination 75 %

Presentation 0 %

Participation in Tutorials 0 %

Project work 0 %

Assignments 10 %

Reports 0 %

Research project 0 %

Quizzes 15 %

Other 0 %

Additional information: