The Hebrew University of Jerusalem

Syllabus

Basic electromagnetic and wave theory for Med. students - 77142

Last update 29-10-2020

<u>HU Credits:</u> 3.5

<u>Degree/Cycle:</u> 1st degree (Bachelor)

<u>Responsible Department:</u> Physics

<u>Academic year:</u> 0

<u>Semester:</u> 1st Semester

<u>Teaching Languages:</u> Hebrew

<u>Campus:</u> Ein Karem E. Safra

<u>Course/Module Coordinator:</u> Prof Yinon Ashkenazy

<u>Coordinator Email:</u> yinona@huji.ac.il

<u>Coordinator Office Hours:</u> by appointment

Teaching Staff:
   Prof Yinon Ashkenazy,
Mr. Joseph Bach,
Ms. Noemie Livne,
Mr. Moshe Diamant

Course/Module description:
   Study of some basic concepts of electromagnetic theory and wave theory

Course/Module aims:
   To understand some basic physical concepts behind processes and instruments associated with medicine, such as transmission of nerve impulses, blood circulation, and the principle of operation of ultrasound machine and MRI.

Learning outcomes - On successful completion of this module, students should be able to:
   To calculate the Doppler effect for simple problems, to solve some simple electrostatic and electrical network problems, to describe ray tracing in simple optical systems.

Attendance requirements(%):
   none

Teaching arrangement and method of instruction: Lecture+ exercise

Course/Module Content:
   electrical charge, electrical field, electrical potential, electrical current, resistors capacitors and inductors, Waves in simple mechanical systems, wave reflection, sound waves, Doppler effect, resonance and impedance matching,electromagnetic waves, reflection, absorption, scattering and ionization, generation of electromagnetic waves, optical geometry, refraction, interference, diffraction, simple optical instruments, magnetic field, and magnetic resonance.

Required Reading:
 None

 Additional Reading Material:

none

<u>*Course/Module evaluation:*</u>
End of year written/oral examination 100 %
Presentation 0 %
Participation in Tutorials 0 %
Project work 0 %
Assignments 0 %
Reports 0 %
Research project 0 %
Quizzes 0 %
Other 0 %

<u>*Additional information:*</u>
none