Ben- Gurion University of the Negev
Faculty of Health Sciences
Joyce & Irving Goldman Medical School

Name of the module: Physics 1st year Medicine

Number of module: 471-8-1001 + 471-8-1021

BGU Credits: 5

ECTS credits:

Academic year: 1st year Medicine

Semester: first and second semesters

Hours of instruction: 08:15am -10:00am once/week

Location of instruction: Daily lectures will take place in the Deichmann Building for Health Professions. Specific classroom numbers are indicated in the schedule.

Language of instruction: Lectures will be given in Hebrew.

Cycle: B.Med.Sc

Position: Obligatory module intended for 1st year medical students, as part of their preclinical teaching.

Field of Education: Physics.

Responsible department: Joyce & Irving Goldman Medical School

General prerequisites: none.

Grading scale: Successful passing of the exam with a score of 65 or higher.

Course Description: This course provides a comprehensive study of the physical principles.

Aims of the module: The goal of the Physics module is to introduce and teach basic principles and practice in Physics.

Objectives of the module: Each student will (1) develop a conceptual understanding of the basic principles of physics in modern medicine; (2) understand the modern medical applications of physics in use at hospitals; and (3) develop a flexible, logical problem solving methodology applicable, not only to this course, but to the greater academic and career challenges ahead.

Learning outcomes of the module: On successful completion of the course, the student should be able to:

1. Describe basic understanding of physics concepts
2. Develop problem-solving and critical-thinking skills
3. Integrate and apply various physics concepts to real-life medical physics problems

Attendance regulation: Attendance to the oral lectures is obligatory.

Teaching arrangement and method of instruction: Instruction in the module is based on frontal oral lectures.

Lecturer: Dr. Netzach Farbiash

Contact details:
Office phone: 08-6252604
Cell phone: 050-6859006
Email: Farbiash@bgu.ac.il
Office hours: By appointment

Module evaluation: at the end of the semester the students will evaluate the module, in order to draw conclusions, and for the university's internal needs.

Confirmation: the syllabus was confirmed by the faculty academic advisory committee to be valid on 2012 (academic year)

Last update: 9/2015

Assessment:
Students will be assessed in the module only by passing an exam with a score of 65 or higher.

Work and assignments: Solving problems and reading the relevant text book chapters (before lecture as a preparation, and after it as a review).

Time required for individual work: in addition to attendance in class, the students are expected to do their assignment and individual work: solving problems and read the relevant text book chapters. Due to the method of the module – students are required to study and review the lectures at home. Roughly 30 minutes per an hour lecture. Problem solving learning and preparation will take 4hr.

Module Content\ schedule and outlines:

- Math Intro
- Measurements
- Vectors
- 1D, 2D and 3D Motion
- Rotational Kinematics
- Newton's laws
- Work and Kinetic Energy
- Momentum, Newton's second law and momentum conservation
- Systems of particles: center of mass
- Collisions, Impulse an Momentum
- Rotational dynamics: Rotation Energy and Rotational Inertia
- Angular Momentum
- Introduction to hydrostatic and hydrodynamics
- Oscillations: simple harmonic motion
- Waves
- Electric charge, Coulomb law, Electric field
- Gauss' law with applications
- Electric potential
- Capacitance and capacitors, dielectrics
- Current and resistance
- Circuits
- Magnetic fields: Lorentz's force
- Magnetic fields: Bio-Savard and Ampere laws and applications
- Induction: Faraday's law, Lenz's law
- Electromagnetic waves
- Medical Imaging: x-ray, CT, PET, MRI

Required reading: **Fundamentals of Physics Extended**, 8th Edition, David Halliday, Robert Resnick, Jearl Walker (Wiley)

Additional literature: Every fundamental university physics textbook

*** All learning material will be available to the students on the module's website (high-learn)/ library/ electronic documents available to BGU students.**