### Name of the module: Physics 1st year Medicine

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

<table>
<thead>
<tr>
<th>BGU Credits:</th>
<th>5</th>
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<tbody>
<tr>
<td>ECTS credits:</td>
<td></td>
</tr>
<tr>
<td>Academic year:</td>
<td>1st year Medicine</td>
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<tr>
<td>Semester:</td>
<td>first and second semesters</td>
</tr>
<tr>
<td>Hours of instruction:</td>
<td>08:15am - 10:00am once/week</td>
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<tr>
<td>Location of instruction:</td>
<td>Daily lectures will take place in the Deichmann Building for Health Professions. Specific classroom numbers are indicated in the schedule.</td>
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<td>Language of instruction:</td>
<td>Lectures will be given in Hebrew.</td>
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<td>Cycle:</td>
<td>B.Med.Sc</td>
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<td>Position:</td>
<td>Obligatory module intended for 1st year medical students, as part of their preclinical teaching.</td>
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<tr>
<td>Field of Education:</td>
<td>Physics</td>
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<td>Responsible department:</td>
<td>Joyce &amp; Irving Goldman Medical School</td>
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<tr>
<td>General prerequisites:</td>
<td>none.</td>
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<tr>
<td>Grading scale:</td>
<td>Successful passing of the exam with a score of 65 or higher.</td>
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### 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.
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 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
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.