



Philadelphia University
Faculty of Science
Department of Basic Sciences & Mathematics.

211105, General Physics / Tentative Content

Providing Department : Basic Sciences / Mathematics, Faculty of Science

Module Coordinator(s) : Dr. Zuheir El-bayyari

Level : 1

Credit : 3 credit hours

Prerequisite : None

Lecturer(s) : Dr. Zuheir El-bayyari and Dr. Shatha Al-azzawi

Aims:

This module is offered to students in the faculty of Pharmacology and in the faculty of Nursing. The module will introduce the student to the basic language and ideas of physics that occur in all branches of science and technology. The main objective of this introductory course is to provide the students with a clear and logical presentation of the basic concepts and principles of physics, and to strengthen their understanding through a broad range of interesting applications to the real world

Teaching Method :

Duration: 16 weeks in second semester, 48 hours in total

Lectures: 45 hours in total, 3 per week (including two 1-hour midterm exams)

Tutorials: 13 in total, 1 per week.

Learning Outcomes:

At the end of this course the student is expected to gain understanding the basic laws that govern few phenomena in the real life and to apply these laws at the human body. Studying physics as a basic science is not particularly easy, but we believe it is rewarding, particularly for students planning further training in related sciences. This will be accomplished by understanding principles of motion of a particle, mechanical energy, Newton's Laws of Motion, Circular Motion, Work Energy and Power, Elastic Properties of Materials, Heat, Temperature and the Behaviour of Gases, Thermodynamics, Electric Forces, Fields and Potentials.

Assessment of Learning Outcomes

All learning outcomes are assessed by two tests during the semester, a final examination, and by a variety of assignments.

Mode of Assessment:

Two 1-hour midterm exams (20 % each); assignments (10 %); Final two hours exam (50%).

Syllabus:

- **Vectors :** Coordinates systems and frames of reference, vectors and scalars, some properties of vectors, components of a vector and unit vectors, the scalar product of two vectors, the vector product [4 hours].
- **Motion in a Straight Line:** displacement, average velocity, instantaneous velocity, average acceleration, instantaneous acceleration, one dimensional motion with a constant acceleration, applications, the acceleration of gravity and falling objects [3 hours].
- **Newton's Laws of Motion:** The concept of force, Newton's first law and inertial frames, inertial mass, Newton's second law, weight and effective weight, Newton's third law, some applications of Newton's laws, friction with some examples [6 hours].
- **Circular Motion:** Definitions, centripetal acceleration, uniform and non-uniform circular motion, some applications [3 hours].

- **Work Energy and Power:** Introduction, work done by a constant force, work and kinetic energy, potential energy and conservative forces, dissipative forces, the work energy theorem, solving problems using the work energy theorem [3 hours].
- **Elastic Properties of Materials:** General aspects of stress and strain, Young's modulus, elastic limit, shear modulus, bulk modulus, some applications [3 hours].
- **Heat, Temperature and the Behaviour of Gases :** Temperature scales, molecular masses, pressure, the ideal gas law, gas mixtures, temperature and molecular energies, diffusion [6 hours].
- **Thermodynamics:** Basic definitions, mechanical work, the first law of thermodynamics, the second law of thermodynamics, the carnot theorem and the conservation of energy, entropy, applications on thermodynamics [6 hours].
- **Thermal Properties of Matter:** Thermal expansion, heat capacity, molar heat capacity, specific heat capacity, latent heat of fusion, latent heat of vaporization, phase changes, heat conduction [3 hours].
- **Electric Forces , Fields and Potentials:** Charge and matter, insulators and conductors, electric forces, electric field, electric field lines, electric potential, motion of a charged particle in a uniform electric field, electric current, resistance and Ohm's law, resistivity of different conductors, superconductors, electrical energy and power [6 hours].

Course Time Table:

Week	Subject
1	Vectors
2	Vectors, Motion in straight line
3	The laws of Motion
4	The laws of Motion
5	Circular motion
6	Circular motion, Work, Energy and Power
7	Work, Energy and Power <i>Last day for the first exam, time table will be announced by the Faculty of Pharmacy or the Department of Basic Sciences.</i>
8	Elastic Properties of Materials
9	Heat
10	Temperature and the Behavior of Gases
11	Temperature and the Behavior of Gases
12	Thermodynamics <i>Last day for the second exam, time table will be announced by the Faculty of Pharmacy or the Department of Basic Sciences .</i>
13	Thermodynamics
14	Thermal Properties of Matter
15	Electric forces, Electric fields, and Potentials
16	Final Exam

Attendance Policy :

Lecture attendance is mandatory. The course notes and the textbook are not comprehensive, and additional material will be covered in lectures. The student is responsible for all material covered in lectures.

Expected Workload:

On average the student should expect to spend about 9 hours per week on this module.

Important Dates :

1. 1st and 2nd exams dates will be announced by the faculty of pharmacy for the whole sections.
2. Report Submission: Three weeks before the final exam date.
3. Final Exam : announced by the admission and registration office, please always check !!.

Feedback:

Concerns or complaints should be expressed directly and immediately to the course lecturer. At the end of the course, the students will fill a course evaluation form, evaluating the course contents, its teaching, the learning, assessment methods, and the lecturer. Analysis of the student's feedback will be useful to improve the quality of teaching and learning processes and related activities.

Textbooks and Supporting Material:

Recommended texts:

- 1- Joseph W. Kane and Morton M. Sternheim **Physics**, Third edition, John Wiley & Sons, 1988. (ISBN : 0-471-63845-5).

The above book does not cover exactly the material in this module in details. It is useful for a short and quick review of the material and for practicing on a short problems and questions solving. Therefore; for a more detailed material, discussions and improvements of your study on the module, please refer to the following supporting references:

Supplementary texts:

- 1- Raymond A. Serway, **Physics for Scientists and Engineers**, 4th edition, Saunders Golden Sunburst Series, 1990.
- 2- D. Halliday and R. Resnick **Fundamentals of Physics**, 6th edition , 2002 (ISBN:0471228575).
- 3- H. D. Young and R. A. Freedman **University Physics**, 9th edition, Addison – Wesley, 1996. (ISBN:0-201-57157-9).
- 4- H. D. Young, R. A. Freedman, T. R. Sandin, And A. Lewis Ford, **Sears and Zemansky's University Physics**, 10th edition, 2000. (ISBN: 0-201-60322-5).
- 5- Jerry B. Marion and William F. Hornyak, **General Physics with Bioscience Essays** , 2nd Edition John Wiley & Sons, Inc, 1985.

Instructors:

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