UNIVERSITY of NICOSIA

Course Syllabus

Course Code	Course Title	ECTS Credits
PHYS-160	General Physics II	8
Prerequisites	**Department**	**Semester**
MATH-190 or MATH-195	Engineering	Fall, Spring
Type of Course	**Field**	**Language of Instruction**
Required	Science	English
Level of Course	**Lecturer(s)**	**Year of Study**
1st Cycle	Dr Marios Nestoros	2nd
Mode of Delivery	**Work Placement**	**Corequisites**
Face-to-face	N/A	None

Course Objectives:

The main objectives of the course are to:

- Introduce students to the basic concepts of electricity and magnetism.
- Help students develop an understanding of the principles taught as well as analytical problem-solving ability.
- Consolidate the basic principles discussed in the theoretical section of the course with laboratory experiments and computer applets/simulations.

Learning Outcomes:

After completion of the course students are expected to be able to:

- Explain the processes of electrification of objects in terms of electron transfer and separation.
- Calculate the electric field created from discrete and continuous distribution of charge and relate it to the Coulomb force.
- Calculate the electric field from potential and vice versa.
- Explain the concept of electrical potential energy and a capacitor as an energy/charge storing device.
- Explain the microscopic basis of electric current in conductors,
- Analyze electric circuits involving resistors and capacitors.
- Calculate the magnetic force on charged particles and current carrying wires.
- Describe and analyze the motion of charged particles in electric and magnetic fields.
- Investigate experimentally the above laws and principles.

Course Content:

Lectures

1. Electric charge, Coulomb's law, conductors, insulators.
2. Electric field & lines, Electric dipole. Electric flux and Gauss' law.
3. Electric potential and electrical potential energy.
4. Capacitance, capacitors in combination. Dielectrics.
5. Electric current, current density, resistance, resistivity, Ohm's law. Kirchoff's Law's, Circuit analysis (including R-C).
6. Magnetic field, magnets, magnetic force on moving charge, Laplace force, Biot-Savart law, force between two parallel conductors.

Experiments and Simulations:

Selection of Experiments and simulations from: electric field, capacitors, current, Ohm's law, Kirchhoff's laws, RC circuits, magnetic field and force, transformer basics, Lenz's law. A lab manual is available at Students Intranet.

Learning Activities and Teaching Methods:

Lectures (3.5 hours/week); Experiments & Simulations (1.5 hours/week).

Assessment Methods:

Midterm Test, Homework, Lab Work, Final Examination.

Required Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Fundamentals of Physics	Halliday, Resnick, Walker	Wiley	8th Edition	9780470044728

Recommended Textbooks / Readings:

Title	Author(s)	Publisher	Year	ISBN
Electricity and Magnetism	Ben Crowel	http://www.lightandmatter.com/		