

Global Learning Semesters

Course Syllabus

Course: PHYS-160 General Physics II

Department: Engineering

Host Institution: University of Nicosia, Nicosia, Cyprus



Course Summary		
Course Code	Course Title	Recommended Credit Hours
PHYS-160	General Physics II	4
Semester Offered	Contact Hours	Prerequisites
Please contact us	42-45	PHYS-150
Department	Level of Course	Language of Instruction
Engineering	Lower Division	English

Course Description

Introduction to the basic concepts and principles of Physics in the areas of static electricity and electromagnetism. A five hour course that includes four hours of lecture and one hour of laboratory.

Prerequisites

PHYS-150

Topic Areas

1. Electric charge, Coulomb's law, conductors, insulators.
2. Electric field & lines of electric field. Electric dipole.
3. Gauss' law, electric flux.
4. Electric potential.
5. Capacitance, capacitors in combination. Dielectrics.
6. Electric current, current density, resistance, resistivity, Ohm's law.
7. Electromotive force. Circuit analysis.
8. Magnetic field, magnetic force, magnetic dipole.
9. Ampere's law, Biot-Savart law, force between two parallel conductors, force on a wire carrying current. Current loop as a magnetic dipole.
10. Faraday's law of induction, Lenz's law, induced electric field.
11. Inductance, self-induction, RL circuit.
12. Magnetism, magnets, paramagnetism, ferromagnetism.
13. Electromagnetic oscillations. LC circuit, resonance.
14. Alternating current, simple AC circuits, series LCR circuit, transformers.

Laboratory

The basic principles of PHYS-160 are implemented through a comprehensive set of experiments. The Physics laboratories are equipped with PASCO Scientific products and all experiments are developed by PASCO Scientific (the leading seller for equipment for physics labs). All experiments are given to students in the form of handouts from the PASCO manuals.

No.	TITLE OF EXPERIMENT	DESCRIPTION
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1	<u>Electric Charge:</u> Charge attraction and repulsion;	Demonstration
2	<u>Charge Production and Distribution:</u> Faraday ice pail; Electric Field	Demonstration
3	<u>Ohm's Law:</u> Current in a dc circuit, Ohm's law verification	Hands-on experiment
4	<u>Kirchhoff's Voltage and Current Laws:</u> KVL and KCL in series/parallel dc circuits	Hands-on experiment
5	<u>Capacitance and Dielectrics:</u> Charge-voltage-capacitance relation	Hands-on experiment
6	<u>Capacitors:</u> RC circuits, capacitor charging and discharging	Hands-on experiment
7	<u>Magnetic Field Lines:</u> 3-D Magnetic field demonstrator, magnets	Demonstration
8	<u>Faraday's Law:</u> Magnetic force on a current-carrying wire; transformer basic, Lenz's Law	Demonstration

Readings and Resources

Required Textbook

- D. Halliday, R. Resnick and J. Walker, Fundamentals of Physics, Fifth Edition, Wiley, 1997 (ISBN: 0-471-10558-9).

Recommended Reading

- Wolfson R., Pasachoff J., Physics with Modern Physics for Scientists and Engineers, Second Edition, Harber Collins, 1995 (ISBN: 0-06-501016-7).