

Faculty of Engineering & Technology

Physics 2

Information :

Course Code : PHY 132

Level : Undergraduate

Course Hours : 4.00- Hours

Department : Faculty of Engineering & Technology

Instructor Information :

Title	Name	Office hours
Lecturer	AHMED MOHAMED ALI ASHOUR AHMED	2
Assistant Lecturer	Mohamed Essam Abd El Aziz Abd El Aal	20
Teaching Assistant	Ahmed Abdelfattah Abdelaziz Abdelfattah	
Teaching Assistant	Youmna Elsayed Abd Elalem Mohamed Sayed Ahmed	

Area Of Study :

Overall aims of the course are:

- Enrich students knowledge about physical concepts of magnetism.
- Train student about magnetism application related to electrical engineering.

Description :

1) Electricity:

A- Electrostatics:

Vectors - Coulomb's Law . Electric field intensity . Electric potential . Electric potential energy . Relation between electric field and electric force . Relation between electric potential and electric field . The motion of charge in an electric field . The capacitor and capacitance of different types of capacitors . Energy stored in capacitor . Capacitors with dielectric materials . Gauss's Law for electrostatics and its applications for the case of spherical, cylindrical and plane geometries.

B- Electrodynamics:

Electric current macroscopically and microscopically . Ohm's Law and electrical resistance . The resistivity and conductivity . Variation of resistance with temperature . The electrical circuit simple and multi loop electrical circuits and its solutions using Kirchhoff's rule.

2) Magnetism:

A- Magnetostatics:

The Magnetic force due to moving charge and due to an electrical circuit carrying a current in an electric field . Ampere's circuital Law and its applications for the case of long straight wire, a solenoid and a toroid . Gauss's Law of magnetism.

B- Magnetodynamics:

Faraday's Law and its applications for the case of a variable magnetic field or a variable area with respect to time . The self and mutual inductance . Maxwell's equation in integral form and their physical meanings

Course outcomes :

a. Knowledge and Understanding: :

1 -	Explain the difference between different multiplication ways of vectors.
2 -	Distinguish between electric force, electric field and electric potential of electric charges.
3 -	Describe capacitors and different ways of connections.
4 -	Describe RC circuit mechanism and solving electric circuits by kirchoff's laws.
5 -	Explain the magnetic fields, magnetic sources and electromagnetic induction.

b. Intellectual Skills: :

1 -	Evaluate different physical, electrical quantities.
2 -	Evaluate non measurable physical, electrical quantities.
3 -	Predict the action/outcome of different bodies and systems.
4 -	Predict the appropriate volumes, areas, or contours that simplifies problems.

c. Professional and Practical Skills: :

1 -	Apply Physical laws experimentally.
2 -	Measure the different physical parameters and perform experiments related to the magnetism

d. General and Transferable Skills: :

1 -	Work effectively in team.
2 -	Communicate effectively.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Sources of magnetic fields.	7	3	4
Faraday's law	7	3	4
Applications for Faraday's Law	7	3	4
Self and Mutual inductance	14	6	8
Introduction and Vectors	7	3	4
Electric force & Electric field	14	6	8
Gauss Law and applications	14	6	8
Electric potential	14	6	8
Capacitors and dielectrics.	7	3	4
Current, Resistance and DC Circuits	7	3	4
Magnetic field.	7	3	4

Teaching And Learning Methodologies :

Interactive Lecturing
Discussion
Problem solving
Experimental learning
Cooperative learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Final exam	40.00		
Lab	20.00		
Mid-Term Exam 1	15.00		
Mid-Term Exam 2	15.00		
Participation and performance	10.00		

Course Notes :

handout and notes

Recommended books :

- College physics+Giambattista and Richardson, Mac gramtill, 3rd edition, 2010.
- Physics for scientists and engineers+Serway, Thomson Brookes/Cok., 8th edition, 2011.