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 studentsʹknowledge about physical concepts of magnetism.
˝Train student about magnetism application related to electrical engineering.

Description :

1) Electricity:
A- Electrostatics:
Vectors - Coulombʹs Law . ʹElectric field intensity . ʹElectric potential . ʹElectric potential energy . ʹRelation between electric field and electric force . ʹRelation between electric potential and electric field . ʹthe motion of charge in an electric field . ʹThe capacitor and capacitance of different types of capacitors . ʹEnergy stored in capacitor . ʹ Capacitors with dielectric materials . ʹGaussʹs Law for electrostatics and its applications for the case of spherical, cylindrical and plane geometries.

B- Electrodynamics:
Electric current macroscopically and microscopically . ʹOhmʹs Law and electrical resistance . ʹThe resistivity and conductivity . ʹVariation of resistance with temperature . ʹThe electrical circuit simple and multi loop electrical circuits and its solutions using Kirchhoffʹs 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 . ʹ Ampereʹs circuital Law and its applications for the case of long straight wire, a solenoid and a toroid . ʹGaussʹs Law of magnetism.

B- Magnetodynamics:
Faradayʹs Law and its applications for the case of a variable magnetic field or a variable area with respect to time . ʹ The self and mutual inductance . ʹMaxwellʹs equation in integral form and their physical meanings

Course outcomes :

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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 kirchoffs 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 Faradays 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

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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 :

a) ‰College physics+ÊGiambattista and Richardson, Mac gramttill, 3rd edition, 2010.
b) ‰Physics for scientists and engineers+ÊSerway, Thomson Brookes/Cok., 8th edition, 2011.

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