

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
Professor	Ossama Mohamed Salaheldin Hassan Nasser	12
Lecturer	Mohamed Ehab Ahmed Fakhr Eldin Bakr	11
Lecturer	Ahmed Mohamed Ali Ashour	
Assistant Lecturer	MOHAMED ZOHDY ABDELHAMID ZAHRAN	16
Assistant Lecturer	Aya Hanfay Reda Hanfy Mohamed	
Teaching Assistant	Ibrahim Ali Ibrahim Ali Zaid	
Teaching Assistant	Ahmed Abd El Fattah Abd El Aziz Abd El Fattah	
Teaching Assistant	Nada El Said Abdallah Hassan Salem	8
Teaching Assistant	Ibrahim Ali Ibrahim Ali Zaid	
Teaching Assistant	Mohamed Essam Abd El Aziz Abd El Aal	16
Teaching Assistant	Dina Hassan Hanafy Hassan	12
Teaching Assistant	Lamia Hamdy Ahmed Kamal Shehab Eldin	16
Teaching Assistant	Mahmoud Ahmed Nasr Kamal Abdo Mostafa	
Teaching Assistant	Romisaa Gamal Mahmoud Abdelrhman	
Teaching Assistant	Nada El Said Abdallah Hassan Salem	8
Teaching Assistant	Mohamed Essam Abd El Aziz Abd El Aal	16

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 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

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
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		

Books :

Book	Author	Publisher
Extended Principles of Physics	David Halliday / Jearl Walker	John Willey
Physics for Scientists and Engineers with Modern Physics	Raymond A. Serway & John W. Jewett	Brooks Cole

Course Notes :

handout and notes

Recommended books :

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