FUTURE UNIVERSITY IN EGYPT جامعة المستقبل

Faculty of Engineering & Technology

Physics 3

Information :

Course Code :	PHY 231	**Level :**	Undergraduate	**Course Hours :**	3.00- Hours

Department : Department of Petroleum Engineering

Instructor Information :

Title	Name	Office hours
Lecturer	AHMED MOHAMED ALI ASHOUR AHMED	10
Lecturer	AHMED MOHAMED ALI ASHOUR AHMED	10
Assistant Lecturer	SHEROUK SOBHI ABDELSALAM FOUDA	2
Teaching Assistant	Mohamed Fathy Salem Mohamed	

Area Of Study :

Enrich studentsôknowledge about Oscillations, Waves, Optics and Modern Physics
Enrich studentsôknowledge about atomic structure and crystal systems.
Train students to apply studied topics on application related to Petroleum engineering.

Description :

Ideal oscillation: representation, Energy and applications. Damped and forced oscillation. Classification of waves, Mechanical transverse wave, Sound waves: types, Speed and Intensity, Doppler effect. Superposition of waves, Standing Waves in string, rods and membranes. Light nature, Reflection, Refraction, Huygen's Principle. Interference: Conditions, Young's double slit, Intensity distribution, phase change. Diffraction: single and double slit patterns, diffraction grating. Polarization. Max-Planck's principle, photoelectric effect, the wave properties of particles, the quantum particle, uncertainty Heisenberg's principle. Hydrogen atom: Bohr's model, solids classification and crystalline structure. X-ray: production, spectral analysis, application.

Course outcomes :

a.Knowledge and Understanding: :	
1 -	Explain the basic principles of oscillations, waves and their classifications.
2 -	Define the sound wave and its applications.
3 -	Explain the different theories of light waves.
4 -	Illustrate the basic principles of Max-Planck and photoelectric effect.
5 -	Describe the basic principles of atomic physics and crystalline structures.
b.Intellectual Skills: :	
1 -	Evaluate the parameters of oscillations and waves.
2 -	Evaluate the parameters of sound waves and the apparent frequency using Doppler effect.

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3 -	Apply the light theories to determine reflection, refraction, diffraction, interference and polarization parameters.
4 -	Apply Max-Planck principle on photoelectric effect to determine the energy of electrons.
5 -	Evaluate the main characteristics of atomic physics.
c.Professional and Practical Skills: :	
1 -	Measured the gravitational acceleration using the simple pendulum.
2 -	Applying the superposition phenomenon to measure the properties of a string.
3 -	Measure the parameters of photoelectric phenomenon.
d.General and Transferable Skills: :	
1 -	Work effectively in a team.
2 -	Communicate effectively.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Ideal oscillation: representation, Energy and applications. Damped and forced oscillation.	12	6	6
Classification of waves, Mechanical transverse wave	5	3	2
Sound waves: types, Speed and Intensity, Doppler effect.	10	6	4
Superposition of waves, Standing Waves in string, rods and membranes.	7	3	4
Light nature, Reflection, Refraction, Huygens' Principle.	5	3	2
Interference: Conditions, Young's double slit, Intensity distribution, phase change. Diffraction: single and double slit patterns, diffraction grating. Polarization.	15	9	6
Max-Planck's principle, photoelectric effect, wave properties of particles, the quantum particle, and uncertainty Heisenberg's principle.	10	6	4
Hydrogen atom: Bohr's model, solids classification and crystalline structure. X-ray: production, spectral analysis, application.	8	6	2
Students Presentation	3	3	0

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
Assignment	5.00		
Final Exam	40.00		
Lab	10.00		
Mid-Term Exam I	10.00		
Mid-Term Exam II	20.00		
Participation	10.00		
Presentation	5.00		

Course Notes :

handout and notes

Recommended books :

1.ñCollege physicsò, Giambattista and Richardson, Mac gramttill, 3rd edition, 2010.
2.ñPhysics for scientists and engineersò, Serway, Thomson Brookes/Cok., 8th edition, 2011.

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