

## Faculty of Engineering & Technology

### Physics 3

#### Information :

**Course Code :** PHY 231

**Level :** Undergraduate

**Course Hours :** 3.00- Hours

**Department :** Department of Structural Engineering & Construction Management

#### Instructor Information :

Title	Name	Office hours
Lecturer	AHMED MOHAMED ALI ASHOUR AHMED	20
Lecturer	AHMED MOHAMED ALI ASHOUR AHMED	20
Lecturer	AHMED MOHAMED ALI ASHOUR AHMED	20
Assistant Lecturer	SHEROUK SOBHI ABDELSALAM FOUDA	4
Assistant Lecturer	Lamia Hamdy Ahmed Kamal Shehab Eldin	2
Assistant Lecturer	SHEROUK SOBHI ABDELSALAM FOUDA	4

#### Area Of Study :

By the end of the course the students will be able to:

- Enrich students' knowledge about Oscillations, waves, optics and Modern physics.
- Enrich students' knowledge about atomic structure and crystal systems.
- Train students to apply studied topics on application related to Structural 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 -	a1- Explain the principals of ideal oscillation
2 -	a2- Define the main terms of mechanical transverse wave
3 -	a3- List the main items of sound waves
4 -	a4- Describe the main concept of superposition of waves
5 -	a5- List the main items of light nature
6 -	a6- Define the main terms of Max-Planck's principle
7 -	a7- Describe the main concept of hydrogen atom: Bohr's model

**b. Intellectual Skills: :**

1 -	b1- Analyze the system of ideal oscillation
2 -	b2- Calculate the values of mechanical transverse wave
3 -	b3- Assess issues of sound waves
4 -	b4- Solve problems regarding superposition of waves

**c. Professional and Practical Skills: :**

1 -	c1- Proceed test steps of the sound waves
2 -	c2- Proceed test steps of the light nature
3 -	c3- Prepare technical reports for hydrogen atom: Bohr's model

**d.General and Transferable Skills: :**

1 -	d1- Cooperate and communicate effectively
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**Course Topic And Contents :**

Topic	No. of hours	Lecture	Tutorial / Practical
Ideal oscillation: representation, Energy and applications. Damped and forced oscillation.	10	6	4
Classification of waves, Mechanical transverse wave	15	9	6
Sound waves: types, Speed and Intensity, Doppler effect	5	3	2
Superposition of waves, Standing Waves in string, rods and membranes	10	6	4
Light nature, Reflection, Refraction, Huygens' Principle	15	9	6
Max-Planck's principle	10	6	4
hydrogen atom: Bohr's model	5	3	2
Revision	5	3	2

### Teaching And Learning Methodologies :

Discussion
Interactive Lecturing
Problem solving
Experimental learning
Cooperative learning

**Course Assessment :**

Methods of assessment	Relative weight %	Week No	Assess What
Final Exam	40.00	16	
Lab	20.00	1	
Mid-Term Exam 1	15.00	6	
Mid-Term Exam 2	15.00	11	
Participation and performance	10.00	1	

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**Course Notes :**

handout and notes

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**Recommended books :**

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