

Faculty of Engineering & Technology

Physics 1

Information :

Course Code : PHY 131

Level : Undergraduate

Course Hours : 4.00- Hours

Department : Faculty of Engineering & Technology

Instructor Information :

Title	Name	Office hours
Lecturer	Mohamed Ehab Ahmed Fakhr Eldin Bakr	17
Assistant Lecturer	Noura Khedr Abdul raheem Ahmed	
Assistant Lecturer	SHEROUK SOBHI ABDELSALAM FOU DA	22
Assistant Lecturer	Romisaa Gamal Mahmoud Abdelrhman	15
Teaching Assistant	Mohamed Yahia Mohamed Abdelkader	
Teaching Assistant	Mohamed Osama Mohamed Abbas	
Teaching Assistant	Mariam Mohamed Kamal Abdelaziz	
Teaching Assistant	Younna Elsayed Abd Elalem Mohamed Sayed Ahmed	
Teaching Assistant	Nadia Mansour Metwally Ali Mourad	

Area Of Study :

The objective of this first physics course for the engineering students is to develop their ability to understand some special topics in classical physics, to analyze and logically solve problems of engineering applications based on these topics. On successful completion of this course, engineering student will be able to:

1. Know and understand old classical physics that is applied up to today.
2. Classify matter in its different states according to their elastic properties.
3. Have a basic knowledge of fluid statics and dynamics for basically fluids moving in a laminar stream line flow.
4. Solve problems of heat evolving different substances changing in state up to they reach thermal equilibrium.
5. Basic knowledge of heat transfer by conduction, convection and radiation.

Description :

Properties of Matter: Units in the SI system of units and conversion of units, Dimensions, Dimension analysis, Elastic Properties of Solids, Stress, Strain, Young's Modulus Shear modulus, Properties of Fluids, Pressure inside a fluid, Bulk Modulus, Buoyant Force, Hydrodynamics, Continuity equation for a laminar Flow, Bernoulli's equation, Pilot tube, Venturi meter, Torricelli's Law, Viscosity, Poiseuille's law, viscous drag and Stoke's law.
Heat and thermodynamics: Zeroth law of thermodynamics, Quantity of heat, First law of thermodynamics, Heat transfer mechanisms, Entropy and the second law of thermodynamics, Some one way processes, Reversible and irreversible processes, Carnot cycle and Carnot engine, The absolute temperature scale, Principles of heat engines and refrigeration.

Course outcomes :

a. Knowledge and Understanding: :

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| 1 - | Identify units in the SI system of units for the physical parameters used in this course and use dimensions and dimension analysis to find their physical laws. |
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2 -	Identify the stress, strain and different elastic modulus for elastic matter.
3 -	Define pressure inside fluid, identify buoyancy forces for floating and emerged solid object in fluids.
4 -	Deduce and apply the continuity and Bernoulli equations for a laminar flow (Pilot tube . Venturi meter . Torricelli's law).
5 -	Understand the zeroth, first and second law of thermodynamics.
6 -	Identify the reversible and irreversible processes Carnot cycle and Carnot engine.
7 -	Identify the basic knowledge of heat transfer by conduction, convection and radiation.

b. Intellectual Skills: :

1 -	Deal with physical problems.
2 -	Think logically and creatively.

c. Professional and Practical Skills: :

1 -	Gaining skills in identifying and using the different physical parameters related to this course, and perform experiments related to these topics.
2 -	Gaining skills in constructing the physical laws and be able to solve the physical problems.

d. General and Transferable Skills: :

1 -	Work effectively in team.
2 -	Develop skills related to creations thinking, problem solving , oral and written presentation, and team work.

Course Topic And Contents :

Topic	No. of hours	Lecture	Tutorial / Practical
Units and Dimensions	10	6	4
Elastic properties of Matter	10	6	4
Hydrostatics	7	3	4
Hydrodynamics	7	3	4
Buoyancy Force	6	2	4
Viscosity	6	2	4
Zeroth Law of Thermodynamics	6	2	4
First Law of Thermodynamics	7	3	4
Heat transfer Mechanics	6	2	4
Entropy and 2nd Law of thermodynamics	10	6	4
Heat processes	6	2	4
Reversible, Irreversible process	6	2	4
Carnot Cycle and Engine	6	2	4
Principles of heat engines and refrigeration	6	2	4
Revision	6	2	4

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	
Semester Work	10.00	1	

Course Notes :

handout and notes

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.