

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 FAKHERELDIN BAKR	18

Area Of Study :

Enrich students knowledge about physical concepts of properties of matter, heat and thermodynamics.

Train student about properties of matter, heat and thermodynamics applications related to engineering.

Description :

Properties of Matter: Units in the SI system 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, Quality of heat, First law of thermodynamics, Heat transfer mechanisms, Entropy and the second law of thermodynamics, some one way processes, Reversible and irreversible processes, PHY 131: Physics I Page 2 of 6

Carnot cycle and Carnot engine, The absolute temperature scale, Principles of heat engines and refrigeration.

Course outcomes :

a.Knowledge and Understanding: :

1 -	Review SI-system of units, dimensions and dimensional analysis to construct physical laws.
2 -	Describe the stress, strain and different elastic moduli for elastic matter.
3 -	Define pressure inside fluid, buoyancy forces for floating and emerged solid object in fluids.
4 -	Describe the continuity and Bernoulli equations for a laminar flow.
5 -	Recognize fundamentals of heat and thermodynamics.

b.Intellectual Skills: :

1 -	Think in creative way to solve physical engineering problems related to fluids.
2 -	Evaluate different parameters of elasticity applied on wide range of disciplines.
3 -	Apply heat and thermodynamic principles to determine related parameters.

c. Professional and Practical Skills: :

1 -	Perform experiments on different physical phenomena including properties of matter, heat and thermodynamics.
2 -	Measure different physical parameters related to studied topics.

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
Units and Dimension analysis	7	1	2
Elastic properties of Matter	14	2	4
Hydrostatics and Buoyancy Force	12	2	3
Hydrodynamics and viscosity	16	2	5
Zeroth Law of Thermodynamics	5	1	1
Absolute temperature scale	9	1	3
First Law of Thermodynamics	9	1	3
Heat transfer Mechanics	18	2	6
Entropy and 2nd Law of thermodynamics	5	1	1
Reversible, Irreversible process, Carnot Cycle and Engine	5	1	1
Principles of heat engines and refrigeration	5	1	1

Teaching And Learning Methodologies :

Interactive Lecturing
Discussion
Problem solving
Experimental learning
Cooperative learning

Course Assessment :

Methods of assessment	Relative weight %	Week No	Assess What
Assignment	5.00		
Final Exam	40.00		
Lab.	10.00		
Mid- Exam 1I	20.00		
Mid- Exam I	10.00		
Participation	10.00		

Course Notes :

handout and notes

Recommended books :

- a) College physics-Giambattista and Richardson, Mac gramtill, 3rd edition, 2010.
- b) Principles of physics-Halliday and Resnick, Jearl Walker, 9th edition, 2012.