Applied Physics

Semester No	Code	Credit Hours
2	PHY-102	2 – 1

TEXT AND MATERIAL:

Textbook (s)

1. Fundamental of Physics by Halliday, Resnick and Jearl Walker,10th Edition (2014)
2. Solid State Electronic Devices by Ben G Streetman. 7th Ed (2014)

References Material:

1. University Physics by Thomas D young & Freedman, 13th Edition (2016)
2. University Physics by Sears & Zemansky, 6th Edition (2016)

PREREQUISITE:

COURSE DESCRIPTION:

The contents of Engineering Physics are the pre-requisite to the Engineering disciplines. The course has been designed to train the undergraduates students in such a way that they willbe able to apply their knowledge and understanding in subsequent semesters for other engineering subjects. This course mainly covers topics of Engineering Mechanics, Statistical Mechanics, Waves, Acoustics, Physical & Geometrical Optics and Solid-State Electronic Devices. However, special emphasis is laid upon clarifying the concepts through problem- solving techniques helpful as a tool to understand and solve the problem which they come across in engineering.

COURSE LEARNING OUTCOMES:

Upon successful completion of the course, the students will be able:

S. No.	CLO Statement	PLO	Learning Domain and Level
1	To describe the basic engineering concepts of Mechanics pertaining to Work Energy Principle, Linear and Angular Momentum, Fluid Dynamics and Laws of Planetary Motion by applying the knowledgeto solve related engineering problems.	PLO-1	C3
2	To appreciate the derivation of General Waves Equations, grasp the concepts in Physical Optics, Geometrical Optics, Energy Bands, Direct & Indirect Semiconductors, PN Junction and Operation of Solid-State Electronics Devices and solving related problems.	PLO-1	C3
3	To validate acquainted theoretical concepts through relevant Lab experiments.	PLO-9	P3

ASSESSMENT SYSTEM:

Quizzes	10-15%
Assignments	5-10%
OHTs	30-40%
ESE	40-50%

TOPICS COVERED WITH THEIR CONTRIBUTION TO PLOs:

Theory:

	LECTURE WISE COURSE BREAKDOWN				
Lec No	**Description**	**Ref (Text Book)**	**Quizzes**	**Assignment**	**CLO No**
1-3	Friction and its types, Linear momentum, Conservation of linear momentum, Elastic and inelastic collisions	Text book-1 Chap 6 & 9	1	1	1
4-6	Angular momentum and conservation ofangular momentum, Work done by a constant and variable force, Kinetic energy and work energy theorem,	Text book-1 Chap 7 & 11			
7-10	Projectile motion, Escape velocity, Themotion of planets and satellites (Kepler's laws), Stress, Strain and Elastic Modulus	Chap 4,12 &13			
11-13	Fluid, Pressure, Pascal's Law and its applications, Continuity equation, Bernoulli'stheorem	Text book-1 Chap14	2	1	
14-15	Boyle, Charles, Guy-Lussic, Dalton and Amagat's laws	Lecture notes	3		
16	**OHT NO - 01**				
17-18	Damped harmonic motion, Travelling waves,Wave speed on a stretched string,	Text book-1 Chap 15,16	4		
19-21	Sound intensity, sound level, sound power, audio frequency, reverberation, Doppler Effect	Text book-1 Chap 17 & Ref. Book 3 Chap 19			

22-23	Interference from thin films, Single slit diffraction	Text book-1 Chap 35 & 36		1	
24-25	Polarization of light, Polarization by reflectionand Brewster's law, Double refraction	Text book-1 Chap 33	5	1	2
26-27	Semiconductor Materials, Energy Bands in metal, semiconductor and insulators, Direct and Indirect Semiconductors, Intrinsic & Extrinsic semiconductors	Text book-2 Chap 1& 3			
28-31	Fermi Level, Hall Effect, Diffusion Process, Diffusion and drift of Carriers (Built in Fields)	Text book-2 Chap 3 & 4	6		
32	**OHT NO - 02**				
33-35	Zener and Avalanche Breakdown, Schottky Barrier/diode, Fundamentals of Bipolar Junction Transistor	Text book-2 Chap 5 & 7			
36-40	**Revision**				
End Semester Exam					

Practical:-

Lab No	Description	CLO	PLO
Lab 01	Introduction to Lab and lecture on lab safety measures	3	9
Lab 02	To find out moment of inertia of an object.	3	9
Lab 03	To determine the Modulus of Elasticity.	3	9
Lab 04	To calculate the velocity of sound in brass rodby using Kundt's tube.	3	9
Lab 05	To find the wavelength of sodium light by Newton's rings.	3	9
Lab 06	To find the grating element of diffraction gratingby using spectrometer.	3	9

Lab 07	To measure the specific rotation of sugar solution by using Polarimeter.	3	9
Lab 08	To verify the Malus' Law	3	9
Lab 09	Production of He-Ne laser	3	9
Lab 10	To calculate the wavelength of Laser light by using Michelson's Interferometer.	3	9
Lab 11	To study the Photoelectric Effect	3	9
Lab 12	To measure the Planck's Constant	3	9
Lab 13	To validate the Hall Effect	3	9
Lab 14	To measure I-V Characteristics of asemiconductor diode	3	9
Lab 15	To validate the characteristic curve of Zenerdiode	3	9
Lab 16	**Open Ended Lab**	3	9
Lab 17-18	**Practice & Revision**		
Lab 19	**End Term Lab Exam / Viva**		

LAB RUBRICS (PLO-9, P3)

S No	Assessment Parameters	Out standing	Good	Average	Below Average	Poor
		(5)	(4)	(3)	(2)	(1)
1	Safety Procedures **(x1.5)**					
2	Equipment Handling and Operations **(x1.5)**					
3	Group Participation **(x1)**					
4	Individual Performance* **(x 6)**					
5	Methodology adopted **(x5)**					
6	Accuracy and Critical Analysis ofResults **(x5)**					
Total						