Prasad V. Potluri Siddhartha Institute of Technology, Kanuru, Vijayawada

PVP20

Department of Freshman Engineering

Applied Physics

Course Code	20BS1205	**Year**	I	**Semester**	II
Course Category	Basic Science	**Branch**	ME	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Nil
Continuous Internal Evaluation	30	**Semester End Evaluation**	70	**Total Marks**	100

Course Outcomes

Upon successful completion of the course, the student will be able to

CO1	**Understand** the principles of Mechanics, Thermal, Optical and Acoustics in technical aspects. (L2)
CO2	**Apply** the basic laws of Heat, Sound and mechanics for engineering applications**.** (L3)
CO3	**Identify** the principles of forces and energy in mechanical system (L3)
CO4	**Analyze** the mechanism of waves, thermal, accoustics and deduce different analytical parameters (L4)
CO5	**Examine** the different mechanical properties and their applications (L4)
CO6	**Study** the principles of Mechanics, Thermal energy, Acoustics, sensors and make a report

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1														
CO2	3												3	2
CO3	3												3	2
CO4		3											3	2
CO5		3											3	2
CO6									2	2		2	3	2

Syllabus

Unit No.	Syllabus	Mapped CO's
1	**Mechanics** :Basic laws of vectors and scalars, Resolution of vectors, parallelogram law of vectors; Conservative and non-conservative forces; F = - grad V; Inertial & Non-inertial frames of reference **Wave mechanics:** wave, Characteristics of waves, Simple harmonic oscillator; Damped harmonic motion; Forced oscillations and resonance. Degrees of freedom.	CO1,CO2, CO4
2	**Elasticity:** Concepts of elasticity and plasticity, stress and strain, Hooke's law, different moduli of elasticity, Poisson's ratio, strain energy, stress-strain diagram, elastic behavior of a material, factors affecting elasticity.	CO1, CO3,CO5
3	**Thermal Properties**: Thermal expansion of solids and liquids; Thermal conduction, convection and radiation and their fundamental laws; Heat conductions in solids; Thermal conductivity - Forbe's and Lee's disc method: theory and experiment; Applications (qualitative only): heat exchangers, ovens and solar water heaters.	CO1,CO2, CO4
4	**Acoustics:** Characteristics of sound waves; Weber-Fechner Law; Absorption coefficient, determination of absorption coefficient; Reverberation time;	CO1,CO2,

	Sabine's formula, Intensity of sound; Acoustics of Buildings, Acoustic requirements of a good auditorium.	CO4
5	**Sensors:** Sensors (qualitative description only); Different types of sensors and applications; working and applications of Strain and pressure sensors magnetostrictive sensors, Fibre optic methods of pressure sensing; Temperature sensor - bimetallic strip, Hall-effect sensor	CO1,CO3, CO5

Learning Resources

Text Books

1. D. Kleppner and Robert Kolenkow "An Introduction to Mechanics– II" Cambridge University Press, 2015
2. M.N.Avadhanulu & P.G.Kshirsagar" A Text book of Engineering Physics"-S.Chand Publications,2017
3. Ian R Sinclair, Sensor and Transducers 3rd edition, 2001, Elsevier (Newnes)

Reference Books

1. M K Varma "Introduction to Mechanics" Universities Press,2015
2. Prithwiraj Purkait, Budhaditya Biswas and Chiranjib Koley, Chapter 11, Sensors and Transducers, Electrical and Electronics Measurements and Instrumentation, First edition., Mc-Graw Hill Education (India) Private Limited, 2013

e- Resources & other digital material

1. http://physicsforidiots.com/physics/electromagnetism/
2. https://www.arcelect.com/fibercable.htm
3. http://freevideolectures.com/Course/3048/Physics-of-Materials/36
4. https://www.iitk.ac.in/mse/electronic-materials-and-devices
5. https://link.springer.com/chapter/10.1007/978-3-319-48933-9_35