Bansilal Ramnath Agarwal Charitable Trust's

Vishwakarma Institute of Information Technology, Pune-48

(An Autonomous Institute Affiliated to Savitribai Phule Pune University)

Department of Mechanical Engineering

Physics (BS11234ME)

Teaching Scheme	Examination Scheme						
Credits: 03 Lecture (L): 02 hrs./week	CIE	ISE	SCE	ESE	PR/OR	TW	Total
Practical (P): hrs./week Tutorial (T): 01 hr.	20	20	20	40	--	25	125

Prerequisite: Basic Physics, Mathematics

Course Objective:

Learn the fundamental principles of Physics and relate the fundamental principles to Mechanical applications.

Course Outcomes:

After completing this course learners will be able to

1. Understand the phenomenon of Mechanics and its applications.
2. Understand and apply the concept of fluid mechanics in Mechanical applications
3. Understand and analyze Physics for vibration reduction
4. Apply and evaluate modern physics for Mechanical applications.

Unit 1: Laws of Motions

Laws of motions, Static and Kinetic friction, laws of friction, rolling friction, Centre of the mass of a rigid body; Basic concepts of rotational motion; a moment of a force; torque, angular momentum, conservation of angular momentum and its applications; the moment of inertia, the radius of gyration

Unit 2: Fluid Mechanics

Properties of fluids and numerical on Density, Viscosity, Temperature, Pressure, Specific Volume, Specific Weight, Specific Gravity, Surface Tension, Vapour Pressure, Capillarity, Cavitation

Unit 3: Vibrations

Introduction to vibrations, Causes and effect of vibrations; Terminologies and elements of vibratory systems, Periodic motion, Simple harmonic motion (S.H.M.), natural frequency and its evaluation, resonance, Springs in series and parallel, Types of vibration, Types of damping.

Unit 4: Physics of Sensors and Instruments

Accelerometer, Tachometer, temperature sensor, Measurements - Accuracy, Precision, resolution, errors, error propagation, Calibration of sensors, Applications of sensors, Lasers and its applications.

List of Practical :

Practical consists of **any six** experiments of the following –

1. Determine the natural frequency and stiffness of spring-mass system.
2. Determine the viscosity of fluid,
3. Determine the MI of a body.
4. Study the resonance phenomenon.
5. Study of Gyroscopic Principle
6. Determine the Surface tension of fluid.
7. Determine rotational speed of shaft using tachometer.
8. Determine accuracy using different measuring instruments.

Text Books:

1. Applied Mechanics, R. S. Khurmi,
2. A Textbook of Fluid Mechanics and Hydraulic Machines By R. K. Bansal,
3. Textbook of Mechanical Vibrations by v. Rao Dukkipati, J. Srinivas
4. Metrology & Quality Control By Anup Goel

Reference Books:

1. Applied Engineering Mechanics Statics and Dynamics By C. Poll, G. Boothroyd
2. Fluid Mechanics By Pijush K. Kundu, Ira M. Cohen, David R Dowling
3. Fundamentals of Vibration Analysis By Nils O. Myklestad
4. Engineering Metrology and Measurements By Raghavendra, Krishnamurthy

Course Coordinator:

BoS Member:

BoS Chairman: Dr. S. S. Kore