

**Subject Code: 02PY0182****Subject Name: Physics-II****B.Sc. Year – I (Sem-II)**

**Objective:** To be able to introspect the fundamentals of energy, mechanical properties of matter, Kinematics of Gases, Heat and Thermodynamics, Waves and their applications.

**Credits Earned: 5 Credits**

**Course Outcomes:** After completion of this course, student will be able to understand

- Apply knowledge of physics in other branches of science to solve scientific problems

**Teaching and Examination Scheme**

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	Mid Sem (M)	Internal (I)	Viva (V)	Term Work (TW)	
4	0	2	5	50	30	20	25	25	150

**Contents:**

<b>Unit</b>	<b>Topics</b>	<b>Contact Hours</b>
1	<b>Work, Potential and Kinetic Energy and Conservation of Energy :</b> Energy, Kinetic Energy, Work, Work and Kinetic Energy, Work done by the Gravitation Force, Work done by Spring Force, Work done by a General Variable Force, Power, Work and Potential Energy, Determining Potential Energy Values, Conservation of Mechanical Energy,	15
2	<b>Mechanical Properties of Solids and Fluids :</b> Elasticity, Stress, Strain, Hookes law, Modulus of /Elasticity, Types of modulus of Elasticity, Fluid, Density and Pressure, Fluids at Rest, Measuring Pressure, Pascal's Principle, Archimedes Principle, Ideal /Fluid in Motion, The equation of Continuity, Bernoulli's Equation, Application of Bernoulli's Equation.	15
3	<b>Kinetic Theory :</b> Avogadro's Number, Ideal Gases, Pressure, Temperature and RMS speed, Translational Kinetic Energy, Mean Free Path, The distribution of molecular speeds, The Molar Specific Heat of an Ideal Gas, Degree of Freedom of and Molar Specific Heats, A Hint of Quantum Theory, The adiabatic Expansion of an ideal gas.	15
4	<b>Heat and Thermodynamics :</b> Temperature, The Zeroth law of Thermodynamics, Measuring Temperature, The Celsius and Fahrenheit scale, The absorption of Heat by Solids and Liquids, The First Law Thermodynamics, Some Special Cases of the First Law of Thermodynamics, Irreversible Process and Entropy, The Second of law of Thermodynamics, Entropy in the Real World Engine, The efficiency of Real Engines, A stoical view of Entropy.	<b>15</b>
	<b>Total</b>	<b>60</b>

**Reference Books :**

1. Principles of Physics – Halliday, Resnick and Walker, 10<sup>th</sup> edition Wiley Publication (2015)

**Physics**

2. SEARS AND ZEMANSKY'S University Physics with Modern Physics 13<sup>th</sup> edition by H. D. Young and R. A. Freedman. Pearson Publication (2012)

3. Lectures on Physics Vol. 1, 2, 3 by Feynman, Pearson Publication (2009)

Distribution of Theory for course delivery and evaluation					
Remember	Understand	Apply	Analyze	Evaluate	Create
20%	20%	30%	15%	10%	5%

**Suggested List of Experiments:**

1. To measure the thermal conductivity of a poor conductor.
2. To find the Poisson's ratio of a rubber tube.
3. To study Newton's of Cooling.
4. To perform Melde's Experiment.
5. To find the velocity of sound Resonance Tube Experiment.
6. To find the frequency of A.C. mains by using Sonometer Experiment.
7. To determine the temperature dependence of the resistivity of a thermistor.

**Instructional Method:**

- a. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- b. The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.
- c. Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- d. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory