B. Tech.	1	Semester	1 / 2	Teaching Scheme				Evaluation Scheme	
Subject Name	Physics - Introduction to Mechanics and Thermodynamics Lab			L	T	P	Credits	CCE	SEE
Subject Code	BTAS21109			0	0	2	1	25	25
Type of course	BSC: Basic Science Course			CCE: Continuous and Comprehensive Evaluation SEE : Semester End Evaluation					
Prerequisite	Basic understanding of Maths, Physics and Chemistry								
Rationale	The basic science - physics course is to prepare students for careers in engineering program where physics principles can be applied to the advancement of technology. This education at the intersection of engineering and physics will enable students to seek employment in engineering upon graduation while, at the same time, provide a firm foundation for the pursuit of graduate studies in engineering.								

Course Outcomes (COs): At the end of the course, students will be able to		Marks % Weightage
CO – 1	Recall and interpret classical mechanics principles including forces, motion, momentum, and energy conservation.	23 %
CO – 2	Apply stress-strain relationships, elasticity, and motion in non-inertial frames.	23 %
CO – 3	Analyse fluid mechanics problems using concepts like pressure, buoyancy, and Bernoulli's theorem.	27 %
CO – 4	Apply thermodynamic principles to assess energy transfer, entropy, and efficiency in thermal systems.	27 %

Sr. No.	List of Laboratory Practical	CO
1	Theory of Error	CO4
2	To determine the rigidity modulus (shear modulus) of a given wire using a torsional pendulum and verify the relation for the time period of oscillations.	CO2
3	Determine the Young's modulus of the material using the bending of a Wooden Beam.	CO2
4	Determine the Young's modulus of the material using the bending of a Steel Beam.	CO2
5	Determine the moment of inertia of a given body (disc, flywheel, or bar) about its axis of rotation using a torsional or rotational method. Cantilever	CO2
6	To determine the deflection of a cantilever beam under different loads and calculate the modulus of elasticity (Young's modulus) of the wooden beam material.	CO2
7	To determine the deflection of a cantilever beam under different loads and calculate the modulus of elasticity (Young's modulus) of the steel beam material.	CO2

8	To determine the coefficient of viscosity of a given liquid using Stokes' Law and study the effect of fluid resistance on motion.	CO3
9	To determine the frequency of alternating current (AC) mains supply using a sonometer and electromagnet.	CO4
10	To determine the frequency of a tuning fork using a vibrating string under resonance condition.	CO4
11	To determine the speed of sound in air using the resonance tube method and measure the first and second resonant lengths.	CO4
12	To verify the laws of transverse vibrations of a stretched string: e. g. Melde's law	CO1
13	Radiation Correction- To find the radiation correction in final temperature in Joule's experiment.	CO4
14	Planck's Constant - To determine Planck's constant (h) using photovoltaic cell.	CO4
15	Stefan's law of Radiation - To verify Stefan's fourth power law of cavity radiation.	CO4

Recommended Reference Books

1. J. L. Meriam and L. G. Kraige, Engineering Mechanics: Dynamics, 9th ed. Hoboken, NJ, USA: Wiley, 2021. ISBN: 978-1118133133.
2. R. C. Hibbeler, Mechanics of Materials, 10th ed. Boston, MA, USA: Pearson, 2017. ISBN: 978-0134444195.
3. F. M. White, Fluid Mechanics, 8th ed. New York, NY, USA: McGraw Hill, 2020. ISBN: 978-0077422417.
4. B. R. Munson and D. F. Young, Fundamentals of Fluid Mechanics, 7th ed. Hoboken, NJ, USA: Wiley, 2020. ISBN: 978-1119489489.
5. R. W. Fox and A. T. McDonald, Introduction to Fluid Mechanics, 8th ed. Hoboken, NJ, USA: Wiley, 2020. ISBN: 978-1119134315.
6. J. M. Gere and S. P. Timoshenko, Introduction to Mechanics of Solids, 1st ed. New Delhi, India: CBS Publishers, 2018. ISBN: 978-8123909071.
7. F. P. Beer and E. R. Johnston, Mechanical Properties of Solids, 3rd ed. New York, NY, USA: McGraw Hill, 2021. ISBN: 978-0071223740.
8. D. F. Young and B. R. Munson, Engineering Fluid Mechanics, 9th ed. Hoboken, NJ, USA: Wiley, 2022. ISBN: 978-1119444708.

CO-PO-Mapping

CO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO – 1	3	3	1	1	-	-	-	-	-	-	-	3
CO – 2	3	1	3	1	3	-	-	-	-	-	3	-
CO – 3	3	1	3	3	3	-	-	-	-	-	-	-

CO – 4	3	1	1	1	-	-	3	-	-	-	-	3

List of Open Source/learning website/Other Details if any:

1. https://archive.nptel.ac.in/courses/115/106/115106123/
2. https://archive.nptel.ac.in/courses/115/103/115103115/