INDIAN INSTITUTE OF TECHNOLOGY TIRUPATI
भारतीय प्रौद्योगिकी संस्थान तिरुपति
Yerpedu-Venkatagiri Road, Yerpedu Post, Tirupati District, Andhra Pradesh - 517 619

1.	Title of the course	Kinetic Theory of Gases and Thermodynamics
2.	Course number	PH201L
3.	Structure of credits (L-T-P-C)	3-0-0-3
4.	New course/modification to	New
5.	To be offered by	Physics
6.	Proposed by	Reetesh Kumar Gangwar
7.	Prerequisite	None
8.	**Course Objective(s):** To discuss kinetic theory of gases, transport phenomena involved in ideal gases, fundamental laws of thermodynamics and applications to various thermodynamical systems and processes.	
9.	**Course Content:** Kinetic theory of gases: mean free path, collision probability; Fundamentals of transport phenomena, viscosity, diffusion, thermal conductivity in gases; Brownian motion and its significance, Einstein's theory of molecular diffusion, Perrin's experiment; Real gases, deviation from ideal gas equation, van der Waals equation of state, virial coefficients; Thermodynamics: zeroth and first laws of thermodynamics, quasi-static processes, work and internal energy, isothermal and adiabatic processes; Second law of thermodynamics, Clausius' theorem, entropy, Third law of thermodynamics, Carnot's theorem and Carnot's cycle, Otto and Diesel cycles; Enthalpy, Helmholtz and Gibbs free energies, thermodynamic equilibrium, Clausius-Clapeyron equation, Maxwell's thermodynamics relations and Gibbs–Duhem equation.	
10.	**Textbook(s):** 1. Zeemansky K W and Dittman R, Heat and Thermodynamics, 8th Edition, McGraw Hill Education (2017). 2. Atkins P, Paula J and Keeler J, Atkins' Physical Chemistry, 12th Edition, Oxford University Press (2022).	
11.	**Reference(s):** 1. Garg S C, Bansal R M and Ghosh C K, Thermal Physics: with Kinetic Theory, Thermodynamics and Statistical Mechanics, 2nd Edition, McGraw Hill Education (2017).	