Thermodynamics and Statistical Physics (BMETE11AP60)

Schedule for semester 2024/25/2

Red denotes material beyond textbook, covered by supplementary notes

Week	Date	Topic	Finn's 3rd ed.	Additional literature
1	Feb. 13	Temperature; 0th law; Temperature scales; Thermodynamic states and processes, ideal gas	Chapter 1	SJ 18.1-18.4
2	Feb. 20	Reversible and irreversible processes; Thermodynamic work	Chapter 2	SJ 19.4, 21.3
3	Feb. 27	Heat and internal energy; 1st law; Heat Capacity, specific heat and latent heat; Ideal and van der Waals gases	Chapter 3	SJ 19.1-19.3, 19.5
4	Mar. 6	Heat engines and 2nd law; Thermodynamic temperature scale; Carnot cycle; Otto cycle	Chapter 4	SJ 21.1-21.5
5	Mar. 13	Entropy; Clausius inequality, Fundamental thermodynamic relation	Chapter 5	SJ 21.6-21.8
6	Mar. 20	Helmholtz free energy and other thermodynamic potentials; Thermodynamic equilibrium; Maxwell relations	Chapters 7, 11	
7	Mar. 27	Principles of statistical physics; Micro- and macrostates; Interpretation of entropy; Microcanonical and canonical ensembles	Chapter 6	
8	Apr. 3	Kinetic theory of gases; Equipartition; Maxwell-Boltzmann distribution, Barometric formula	Chapter 6	SJ 20.1-20.5, SMM 10.1-10.2
9	Apr. 10	Mean free path approximation; heat diffusion and viscosity		
10	May 8	Phases and phase changes; Clausius-Clapeyron relation	Chapter 10	
11	May 15	3rd law, Distinguishable and indistinguishable particles; Gibbs paradox	Chapter 12	
12	May 22	Quantum statistics	Chapter 13	SMM 10.3-10.5