Dr. V.D.Kulkarni,
Dept of Physics
HutatmaRajguruMahavidyalaya,
Rajgurunagar (Pune)

Syllabus Completion Report (2023-24)

T.Y.B.Sc. (Sem-VI)

Thermodynamics and Statistical Physics (PH-363)

Sr. No.	Completed Topics	Dates
01	**Ch-1 - Kinetic Theory of gases** Mean Free Path Theory of gases	01/01/2024 To 16/01/2024
02	Transport Phenomena, Viscosity	
03	Thermal conductivity and diffusion	
04	Thermodynamic functions	
05	Enthalpy, Entropy, Internal Energy, Helmholtz Functions	
06	Maxwell's relations	
07	First and Second TdS equations Specific and Latent heat equqtions	
08	Joule – Thomson's effect, Problems	
09	**Ch-2- Elementary Concepts of Statistics** Probability ,Distributions functions,Problems	17/01/2024 To 23/01/2024
10	Random Walk Problem and Bionomial distribution	
11	Simple Random Problem, Calculation of mean Values	
12	Probability distribution for large N	
13	Gaussian Probability distribution and Problems	
14	**Ch-3- Statistical distribution of system of particles and Ensembles** State of Systems, Statistical Ensembles	27/02/2024 To 14/03/2024
15	Basic Postulates, Probability Calculations	
16	Behavior of density of states	
17	Thermal. Mechanical Interactions,	

	Problems	
18	Micro canonical Ensembles, Canonical Ensembles	
19	Applications of Canonical Ensembles	
20	Molecules in ideal gas, Mean Values in Canonical Ensembles, Problems	
21	**Ch-4-Introduction to Quantum States** Quantum distribution function	15/03/2024 To 22/03/2024
22	Maxwell – Boltzman Statistics, Bose – Einstein Statistics	
23	Fermi – Dirac Statistics	
24	Comparisions of B-E,M-B,F-D Statisctics , Applications of Quantum Statstics	
25	Problems	
26	Internal Test	04/03/2024 to 07/03/2024

Dr. V.D.Kulkarni

Dr. V.D.Kulkarni,
Dept of Physics
HutatmaRajguruMahavidyalaya,
Rajgurunagar (Pune)

Syllabus Completion Report (2022-23)

T.Y.B.Sc. (Sem-VI)

LASERS (PH-366)

Sr. No.	Completed Topics	Dates
01	**Chapter 1: Introduction to Lasers:** Brief history of Lasers, Interaction of radiation with matter, Energy levels, Population density, Boltzmann distribution, Stimulated Absorption, Spontaneous Emission and Stimulated Emission, Einstein's Coefficients, Einstein's relations. Characteristics of Laser: Directionality, Mono-chromaticity, Coherence,	24/01/2024 To 29/01/2024
02	**Chapter 2: Laser Action**: Population inversion, Condition for light amplification, Gain coefficient, Active medium, metastable states. Pumping schemes: three level and four level	30/01/2024 To 01/02/2024
03	**Chapter 3: Laser Oscillator**: Optical feedback, round trip gain, critical population inversion, Optical resonator, condition for steady state oscillations, cavity resonance frequencies.	06/02/2024 To 08/02/2024
04	**Chapter 4: Laser Output**: Line-shape broadening: Lifetime broadening, Collision broadening	08/02/2024 to 10/02/2024

05	**Chapter 5: Types of Lasers:** Solid State Lasers – Ruby Laser, Diode Laser, Gas Lasers – HeNe Laser, CO2 Laser	12/02/2024 To 20/02/2024
06	**Chapter 6: Applications of Lasers**: Industrial: welding, cutting, drilling Nuclear Science: laser isotope separation, laser fusion, Medical: eye surgery	21/02/2024 To 26/02/2024

1) T.Y.B.Sc.:-08 Practicals of one batch completed in Second Semester of Academic Year 2023-2024.
2) Projects of T.Y.B.Sc Students.:- Projects of one batch completed in Second Semester of academic Year 2023-2024.
3) F.Y.B.Sc.:- 08 Practicals of one batch completed in Second Semester of Academic Year 2023-2024.

Dr. V.D.Kulkarni