Semester	AUG 2022
Open to semester	7,13,21
Course code	**PH4123/PH6163**
Course title	**Statistical Mechanics ? II**
Credits	3 /3
Course Coordinator & participating faculty (if any)	Sreejith G. J.
Nature of Course	Lectures and Tutorials
Pre-requisites	Statistical Mechanics I Quantum Mechanics I
Objectives (goals, type of students for whom useful, outcome etc)	This course introduces some specialized and advanced topics in statistical mechanics
Course contents (details of topics /sections with no. of lectures for each)	Topics (rough number of classes including tutorials in bracket) Interacting classical particles (4) Quantum gas of non-interacting identical particles (5) Classical Ising Model and transfer matrix, Ornstein Zernicke correlation, Peierls argument, Mean field theory, Phase transitions, Landau Gizburg (7) Basics of real space renormalization (5) The Boltzmann equation, H-theorem and Irreversibility, Conservation laws, Hydrodynamic equations in local equilibrium. (6) Introduction to Brownian motion, Langevin dynamics, Fluctuation-dissipation theorem, Fokker-Planck dynamics, Master equation,Barrier overcoming processes. (6)
Evaluation /assessment	End-Sem Examination-60% Mid-Sem Examination-40% Others-0%
Suggested readings (with full list of authors, publisher, year, edn etc.)	Statistical Physics of Particles (M Kardar) Principles of equilibrium statistical mechanics (Chaudhury, Stauffer) Scaling and Renormalization in Statphys (Cardy) First steps in Random walks (Klafter, Sokolov) Non equilibrium statmech (V Balakrishnan) AMS Introductory probability (Grinstead, Snell)

	Statistical Mechanics (K. Huang) Statistical Mechanics (F. Schwabl) Fundamental of Statistical and Thermal Physics (F. Reif)