14P1WPH113Fluctuation And Magnetism

Subject Code	**14P1WPH113**		**Semester**	
Credits	3		**Contact Hours:03**	
Module No.	**Subtitle of the Module**	**Topics**		
1.	Introduction	Energy: Most Probable and mean, Particle number: most probable and mean, grain distribution function vs log normal distribution in temporal and thermal sintering		
2.	Fluctuations	fluctuations in energy, fluctuations in volume, fluctuations in particle number, Cross correlation between fluctuations, fluctuations in entropy, fluctuation of fundamental thermodynamic quantities .		
3.	Microstate population fluctuations	Ideal Bose gas, ideal Fermi gas, ideal Boltzmann gas. Classical versus Quantum fluctuations, correlation Functions. Fluctuation response: Illustration with ising magnets, Illustration with simple fluids. Measurement of correlation, radial distribution function for fluids.		
4.	The Landau approach	Landau free energy, mathematical Digression, Derivation in Simple Models, mean field theory, The tricritical point, the Gaussian model, The Ginzburg criterion		
5.	Magnetic Resonance	programming and computation of free energy functional .		

	Recommended Reading (Books/Journals/Reports/Websites etc.: Author(s), Title, Edition, Publisher, Year of Publication etc. in IEEE format)
1.	(L.D. Landau and E.M. Lifshitz : Course of Theoretical Physics Statistical mechanics part-1 Statistical mechanics part-2
2.	Debashish Chowdhury and Dietrich Stauffer : Principles of Equilibrium Statistical mechanics
3.	K.Huang: Statistical Mechanics
4.	R.K. Pathria: Statistical Mechanics
5.	John H.Mathews and Kurtis D. Fink : Numerical methods using Matlab