Statistical Mechanics: Course Material

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1. A review of thermodynamics with the microscopic point of view

2. Probability theory, stochastic processes

3. Foundations: ergodicity, ensembles and applications

4. Phase transitions: thermodynamic description

5. Statistical mechanics of phase transition: mean field theory, critical phenomena and renormalization group

6. Non-equilibrium statistical mechanics: equations of motion, fluctuation-dissipation theorem, the role of conserved quantities

7. Special topics