

Physics 6107 – Statistical Mechanics I

Spring 2009, MWF at 10:05am-10:55am in Howey S204

Lecturer: Toan T Nguyen

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Office Hours: F 11am-12am or by appointment.

Class TA: Se Il Lee, gtg095n@mail.gatech.edu, Room W210

Prerequisite: Thermal physics or thermodynamics.

Overviews:

- *Thermodynamics:* Thermal equilibrium, laws of thermodynamics, temperature, energy, entropy and other state functions
- *Statistical Mechanics:* Microstates, entropy, ensemble theory, microcanonical ensemble, canonical ensemble, and grand canonical ensemble, applications
- *Quantum statistics:* Density operators, symmetry of many particles wave function, ideal Bose and Fermi gas.
- *Phase transitions:* Virial expansions, classifications, models of Ising and Heisenberg.

Recommended text

- “Thermodynamics and Statistical mechanics”, Greiner, Neise and Stöcker, Springer
- MIT Online lecture notes (OpenCourse) by Prof. M. Kadar.
- “Statistical physics, Part 1”, Landau and Lifshitz, BH.
- “Statistical Mechanics”, Huang K., Wiley
- “Statistical Mechanics”, Pathria R. K., Pergamon.

Grading:

Homework (weekly or biweekly), 25%

First mid-term exam, 20%

Second mid-term exam, 25%

Final exam, 30%