Winter 2013

Physics 35200 Statistical Mechanics
Day/Time: WF   09:00 - 10:20 am
Location: KPTC 105
Lecturer: Cheng Chin, cchin@uchicago.edu
Office: GCIS 107
Office Hours: WF   10:30 - 11:30 am
Grader:
Website: http://ultracold.uchicago.edu/phys_winter13

Class outline:
Thermodynamics
Wk 1   01/09 W   Laws of thermodynamics
Wk 1   01/11 F   Entropy and thermodynamic potentials

Statistical mechanics
Wk 2   01/16 W   Statistical distribution
Wk 2   01/18 F   Statistical entropy   *HW1*
Wk 3   01/23 W   Statistical ensembles
Wk 3   01/25 F   Gibbs distributions
Wk 4   01/30 W   Non-interacting systems and equivalence of ensembles
Wk 4   02/01 F   Interacting systems (I)   *HW1 due, HW2*
Wk 5   02/04 M   Interacting systems (II)
Wk 5   02/06 W   Fluctuations and correlations (I)
Wk 5   02/08 F   Fluctuations and correlations (II)
Wk 6   02/11 M   Non-equilibrium statistical mechanics   *HW2 due, HW3*

Quantum systems and critical phenomena
Wk 6 02/13 M   Fermi and Bose distributions
Wk 6 02/15 W   Mean-field theory
Wk 7   *No class*
Wk 8 02/27 M   Thermodynamic equilibrium in an isolated system?
Wk 8 03/01 W   Class presentations   *HW3 due, HW4*
Wk 9 03/06 M   Phase transitions and criticality
Wk 9 03/08 W   Scale invariance and renormalization group   *HW4 due*

Evaluation
  Problem sets: 50%   Presentation/term paper: 50%

Textbooks
  (recommended) *thermodynamics,* Enrico Fermi
  (required) *Statistical Physics (Part I),* L. D. Landau and E. M. Lifshitz