PHYS 8301: Statistical Physics I

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Course website: www.smsyslab.org/teaching.html

Topics: The first of two parts of this course covers general theoretical concepts of thermodynamics and classical statistical physics. The macroscopic description of thermal behavior by means of a few state variables such as temperature, pressure, free energy, entropy, etc. is based on the Thermodynamic Laws, whereas its microscopic justification is provided by the statistical analysis of the system's individual degrees of freedom. The course reviews the historic foundation of thermodynamics and introduces probability and ensemble theory for the appropriate treatment of the typically huge number of configurational and kinetic degrees of freedom in a macroscopic system.

References: There is a large number of textbooks dealing with these classical fields of physics and the course material will not be based on a specific one. Recommendations include: *Statistical Physics* by L. D. Landau and E. M. Lifshitz; *A Modern Course in Statistical Physics* by L. E. Reichl; *Fundamentals of Statistical and Thermal Physics* by Frederick Reif.

Class: Tuesday and Thursday, 11:00am–12:15pm, room 254 Physics Bldg.

Office Hours: You can contact me at any time.

Exams: Midterm and Final. The midterm exam will be in early October; the final exam in early December. In both exams, only own hand-written lecture notes and homework solutions are admitted, but no text books or printed scripts. Excused midterm exam absence causes the grade of the final exam to be substituted for the midterm exam; unexcused absence entails grade F. Missing the final exam without documented reason results in failing the course. If the instructor decides that final exam absence was excusable, an oral make-up exam will be set up.

Homework: There will be graded assignments on a regular basis (probably bi-weekly) with deadlines. No late homework is accepted. No submission via email.

Grade: Total Grade = (Homework + Midterm + Final)/3

Grading: [100,85]: A; (85,82.5]: A^-; (82.5,80]: B^+; (80,70]: B; (70,67.5]: B^-; (67.5,65]: C^+; (65,55]: C; (55,52.5]: C^-; (52.5,40]: D; (40,0]: F

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