Physics 607, Statistical Mechanics

Instructor: Roland E. Allen

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Office hours: Monday 3-4 p.m., Tuesday 3-4 p.m., Wednesday 3-4 p.m., Thursday 3-4 p.m.; or by appointment.

Textbook: *Statistical Mechanics*, 3rd Edition, by R. K. Pathria and P. D. Beale. You may want to bring your copy of the textbook to class for easier note-taking. My (hopefully improved) version of each treatment will often differ substantially from that in the textbook, but I will also usually indicate where the relevant material is in the textbook.

Evaluation: homework 40%

2 “midterm” exams 40%

final exam (comprehensive) 20%

**Homework is due at the beginning of the first class each Wednesday.**

Homework presentations are also in this class, of course. Homework late by < 48 hours, 1/2 credit. Homework late by > 48 hours, no credit.

The “midterm” exams will be in the evening at 7:15 - 10:00 p.m., in Room 203 MPHY, on

**Thursday, October 6, and Thursday, November 17.**

The final exam will be at the time specified by the university at http://registrar.tamu.edu/General/FinalSchedule.aspx, which is

**Monday, December 12, 3:30 - 5:30 p.m.**

There is the possibility of getting extra credit if you arrange for this (1) before any other volunteer for a given homework problem, to present that problem in class, or (2) by Friday Nov. 18 for a 10-minute talk at the end of the semester. The maximum extra credit for presenting the solution of a homework problem to the class is equal to the credit for doing two homework problems; the time allocated for a presentation is 5 minutes maximum (plus a question and answer period not to exceed 3 minutes). Please arrive early and put your problem on the board before class.

If you give a 10-minute talk, the maximum credit is equivalent to an extra homework set. The 10-minute talks will be given at 7:00 p.m. on Tuesday, December 6.

Topics not in the textbook include (i) review of some techniques in thermodynamics (from Callen), (ii) basics of the BCS theory of superconductivity (L.E. Reichl, *A Modern Course in Statistical Mechanics*, 2nd edition, pp. 407-417), (iii) the Rayleigh-Bénard instability as an example of a nonequilibrium phase transition (Reichl, pp. 742-752).