NOTES FOR THE FINAL EXAM
FALL 2012

The final exam will be held in the classroom on Thursday, 13 December from 1 pm - 3 pm. As with all other exams, it will be closed book, closed note, calculators or other electronic or computational devices will not be allowed. I will give you a list of equations and useful formulae. Unlike the hour exams, I will collect the final exam sheets with your blue books.

The exam will cover everything that was discussed in class (except for the student group presentations), was assigned for reading, or was on the homeworks. I intend (hope?) to finish degeneracy pressure on Th after the second student presentation, so that the material in Ch. 7 through p. 277 will be on the exam. Since Ch. 7 material has not been covered on any hour exam, I anticipate that it will constitute approximately 15 % of the final exam (roughly twice its weight in terms of time on task); the rest of the test will draw from the material covered earlier in the course.

Included in this will be Maxwell relations (pp. 158-159) and the techniques of integration we studied to analyze thermodynamic systems, including Gaussian integrals and differentiation with respect to a parameter. Be sure that you can use the result::

$$\int_{-\infty}^{\infty} e^{-\beta x^2}\, dx \;=\; \sqrt{\frac{\pi}{\beta}}$$

to determine integrals of the form :

$$\int_{-\infty}^{\infty} x^{\alpha}\, e^{-\beta x^2}\, dx$$

where α is a positive integer and β is a real constant. (Hint: use symmetry for odd values of α).

My office hours during exam week will be :

• M 10 am - 1 pm
• T 10 am - 1 pm
• W 10 am - 3 pm

   The questions on the final will include derivations and combining equations to produce new theoretical results (like problems 1.22 and 1.40. Additionally, there will be prose based questions in which I ask you to explain a concept, like why the entropy increases in certain situations (like question 2.40), or why an equation breaks down (like the situation described in problem 2.35). You may use equations to support your argument, but the heart of the question will be to explain the key concepts of the course.

By Thursday I will post additional suggestions for questions that are representative of the questions that will be on the final.