Course Policy Statement
SP444 Spring 2009
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course webpage: http://usna.edu/Users/physics/mungan/Courses/SP444.html

Course Objective

Unified treatment of the thermodynamics and statistical mechanics of systems of large numbers of particles considered both classically and quantum mechanically, with emphasis upon computational methods and applications.

Textbook

The required textbook for this course is Daniel Schroeder "An Introduction to Thermal Physics" (Addison-Wesley, San Francisco, 2000). The text by Charles Kittel & Herbert Kroemer "Thermal Physics", 2nd edition (W.H. Freeman, NY, 1998) is a standard book in the field and is recommended for additional study, particularly by students who expect to pursue graduate work in physics in the future.

Syllabus & Exams

The plan is to proceed through Schroeder in order, skipping Secs. 1.7, 4.1–4.4, 5.4–5.6, and 8.1, with tests occurring at logical junctures:

I. Thermodynamics
Chap. 1 Secs. 1–6 (37 pages)
Chap. 2 Secs. 1–6 (36 pages)
Test #1
Chap. 3 Secs. 1–6 (37 pages)
Chap. 5 Secs. 1–3 (38 pages)
Test #2

II. Statistical Mechanics
Chap. 6 Secs. 1–7 (37 pages)
Test #3
Chap. 7 Secs. 1–6 (70 pages)
Test #4

III. Computer Project (if time permits)
Chap. 8 Sec. 2 (18 pages)
Final Exam

Homework & EI

Problems, drawn principally from Schroeder, will be assigned as often as practicable. A running list will be kept on the course webpage. The goal will be to assign enough problems to learn and keep up with the material, without assigning an onerous amount at a time to avoid overwhelming you. These assignments are critical to learning the material being presented in class. You are strongly encouraged to work with each other on these problems. However do not make a practice of blindly copying someone else's work, as you will be shortchanging your learning process. Your submissions should be neat, legible, and well organized. I strongly

suggest you work on scrap paper before attempting to write up a final solution. (I always do this myself. Even when I think I have it all figured out, I still end up needing to rewrite it in a more organized fashion.) Solutions must include appropriate notation and units. The goal is to develop understanding, not just get some final answer. Late submissions are always permitted but there will be deductions for tardiness. I am NOT going to post complete solutions this semester. Instead I will only post selected comments and you will need to come by my office if you want a more complete discussion of a solution.

You are permitted to use calculators and computer solvers in this course. Nevertheless, you are exhorted to rely primarily on your own mental insights and intuition rather than on electronic aids. Always ask yourself: What was I supposed to have learned from this problem?

You are highly encouraged to come in for EI but please avoid trying to do the whole problem in my office. Tempting though it may seem to have me shepherd you through every step, in the long run you will be much better equipped if you form study groups, tolerate a bit of fumbling and frustration, and learn from your false starts and oversights. Do not expect to solve a tough problem in 10 minutes; chip away at it doggedly. My schedule is outside my office door and on the web. I prefer you to make an appointment to guarantee I will be in, but you should feel free to walk into my office anytime I am there. I will try to accomodate requests for EI on weekends or evenings, so if you want it, ask for it. Please come to EI prepared with specific questions. Expect me to be a bit tough on you if you walk in without having carefully studied the relevant text readings and class notes or without having made a serious attempt at the problem. Learning is hard BUT YOU CAN DO IT if you apply yourself!

Grades

Homework Assignments: 1 point per set

In-Class Tests: 10 points per test

Computer Project (if time permits): to be determined

Final Exam: 20 points

Your grade at any time equals total points earned divided by maximum points available. Points earned on any item equals your fractional score on that item times the points that item is worth. A few percent boost in grade may be awarded to those falling near a grade cutoff who have come in for EI, asked and answered questions in class, and otherwise demonstrated regular effort.

Notice that if we have about 30 assignments, your course grade will be approximately 1/3 homework, 4/9 in-class tests, and 2/9 the final exam. If you do well on homework and it accurately represents your own understanding, expect to do well on the tests and hence in the course; so concentrate your efforts on reading the book and on doing homework!

I use email and the course webpage to communicate with the class often. Please check them regularly and keep copies of messages as I do not tend to send reminders.