SYLLABUS
PHY 3513, Thermal and Statistical Physics
Fall 2015
Prof. Patrick Schelling

Lecture: Mon., Wed., Fri., 4:00-4:50pm MSB 306
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Office hours: Tues, Thurs 2:00-3:00pm, Wed 10:00-11:00am, or by appointment.

Introduction and summary:
Thermal and statistical physics plays a central role in many phenomena in physics and chemistry. It is also important in engineering applications. We will develop a connection between microscopic physics and the macroscopic observations of thermodynamics via statistical physics. This is not only useful, but intellectually very satisfying approach. It helps to bring together classical and quantum mechanics with observations of phenomena that depend on a large number of particles. In engineering, it serves to identify fundamental limits on what is possible. For example, thermodynamics tells us the limits for the efficiency of heat engines, which is of real practical importance. It also forms a foundation for understanding the properties of matter including phase diagrams, which is a key aspect of materials science.

The approach to this course will be somewhat unusual from traditional formats. The objective is to increase the active participation in class and limit the amount of lecture time. Lecture times will be kept to a minimum, with the rest of classroom time spent working on worksheets in groups. There is a learning assistant (LA) Madelaine Davis assigned to our class. She will attend lecture every day, and be available to answer questions about the in-class worksheets. In addition, she will be available for two hours every week in the “help room” on the first floor of PSB. The times will be determined during the first week of class.

Attendance in class is essentially mandatory. The worksheets will be graded, and most days in class there will be a worksheet. The hope is that the worksheets will be appreciated and help everyone to learn and appreciate the material. So I would hope that the grading aspect is not required to encourage attendance.

We will use Webcourses for grading, and to hand out homework and solutions. Please check the Webcourses site regularly for details about the class.
Required Book:


Suggested Books:

For a very readable, conceptual book, consider:

“An Introduction to Thermal Physics” by D. V. Schroeder

For a more rigorous approach, the following two volumes are appropriate. The books by Landau and Lifshitz are approximately at a graduate level.

“Thermal Physics” by C. Kittel and H. Kroemer
“Statistical Physics” vols. 1 and 2 by Landau and Lifshitz

Grading:

In-class worksheets: 25%
Homework: 25%
Midterm Exam: 25%
Final Exam: 25%

I will drop one homework assignment, and three in-class worksheets. The lowest scores will be dropped. The lowest scores dropped could be zeroes, for example on days where students were not able to attend. Otherwise, only excused absences will be permitted. Excused absences require justification. In the event of an excused absence, either rescheduling will be done, or an excuse will be allowed (probably in the event a daily in-class worksheet is missed).

Exam Dates:

Both exams will be held in the same room as the class, MSB 306.

Midterm Exam: Friday, October 16

Final Exam: During December 9-16, but right now the time/room is TBD. Somehow we are not in a typical time slot so it isn’t showing up on the UCF website.

I will use +/- grades. The following grading scale will be used:

A 86-100
B+ 81-85
I do not curve anything. You get a numerical score on each test and assignment. However, I may, if I feel it is merited, move the cutoffs down a little bit for the entire class. You will always be able to compute your grade, but you might be pleasantly surprised with a slightly higher final grade than you expect (usually by only one level, so if you compute a “B” grade, you might wind up getting a “B+” if the cutoffs are adjusted.

**Holidays:**
There are no classes and office hours on the following holidays:

- Labor Day, Monday September 2
- Veterans’ Day, Monday, November 11
- Thanksgiving, Thursday, November 28 – Saturday, November 30

**Special events:**
There are no classes in the evening due to the following events:

**Missed Work, Makeup policy:**

*It is Physics Department policy that making up missed work will only be permitted for University-sanctioned activities and bona fide medical or family reasons. Authentic justifying documentation must be provided in every case (in advance for University-sanctioned activities). At the discretion of the instructor, the make-up may take any reasonable and appropriate form including, but not limited to the following: a replacement exam, replacing the missed work with the same score as a later exam, allowing a 'dropped' exam, replacing the missed work with the homework or quiz average.*

**UCF Golden Rule:**

Your work should be your own, although working with your classmates is encouraged. Compute projects are group projects, but you are expected and required to participate and understand the work of your group.

Academic cheating and dishonesty will not be tolerated. As science students, the highest standards of honesty are essential. If cheating or dishonesty occurs, it will be handled according to the UCF Golden Rule. Please familiarize yourself with these rules, especially item 17 which relates to Academic Misconduct. Cheating may result in failure or even expulsion.