

**PHYSICS 425/625 THERMAL AND STATISTICAL PHYSICS  
FALL 2011**

**COURSE ABSTRACT:** This practical course covers the foundations of thermodynamics and statistical mechanics. Thermodynamics is about the energy of macroscopic quantities of matter and its transformation. Statistical mechanics connects the microscopic behavior of atoms and molecules with thermodynamics, at once explaining long held empirical thermodynamic relations, and providing a powerful tool for understanding and calculation. Practical applications include atmospheric physics; gases; solids; entropy; chemical thermodynamics; heat engines; basic transport theory of heat conduction, diffusion, and viscosity; and quantum gases, including understanding and applications of black body radiation. We will use instruments and measurements on occasion to demonstrate key principles and methods.

**TAUGHT BY:** William P. Arnott (call me Pat), Professor, Physics Department, patarnott@gmail.com, 775-784-6834 office phone.

**OFFICE HOURS:** Definite hours are 1 pm to 3 pm Wednesday. Other times available by appointment, and you are encouraged to take advantage of this offer.

**TEXT:** An Introduction to Thermal Physics by Daniel V. Schroeder. This excellent, practical book covers the field, and has many very interesting examples and problems.

**CLASS MEETS:** Tuesday and Thursday, 11 am – 12:15 pm, LP 105.

**GRADES**

35% Homework assignments. Homework absolutely facilitates understanding.

Grads will prepare a lecture and have different homework at times.

40% 2 midterms. Each midterm is 20%.

25% Final Exam Final is comprehensive.

**POLICY ON HOMEWORK:** You are encouraged to work with others on the homework assignments, though your submitted homework should be a unique expression of your understanding of the problems rather than an exact copy of each member in your study group.

**POLICY ON LATE HOMEWORK:** 0% possible. Contact me for circumstances.

**ONLINE CONTENT:**

Grades are posted on webct as we go <http://webct.unr.edu> .

**Course administration is through my website <http://phys425.patarnott.com/>**

Any student with a disability needing academic adjustments or accommodations is requested to contact the instructor as well as the Disability Resource Center in Thompson Student Services 107 as soon as possible to allow for appropriate arrangements.

**Final examination: Thursday, 15 Dec 2011 – 8:00 – 10:00 a.m.**

## **GUIDE TO DOING WELL:**

**(My observations of students that get the most out of their course work during this brief time in life when you get to be a student)**

- 1. Attend class, every class. Ask questions in class. I benefit greatly from questions students ask in class as it helps me refine my understanding of the subject matter, and it helps me convey topics more effectively. Other students benefit as well. I am very open to questions in class, and find that when we have a discussion rather than a monologue, we all get a lot more out of our time together, and we can make interesting discoveries as we go along.**
- 2. Do the homework every time, on time.**
- 3. Work with others on the homework so that you learn to work in a group, and you gain the insights of others as they gain from you.**
- 4. Be sure you thoroughly understand the homework and course material.**
- 5. Arrange your daily schedule so that you have time for sleep at night, and can digest the course material daily. Work on each course a little each day.**
- 6. Get started early on everything. It helps cement your knowledge.**
- 7. Eat well, and get some exercise. Some diversions help refresh your enthusiasm and skill.**
- 8. Attend office hours to ask questions and refine your understanding of the subject matter.**
- 9. Seek connections with the subjects of this course and others you are taking or will take later on.**
- 10. Pay close attention to subjects that are of great interest to you, and you may be able to link your future employment in some way to the concepts of this course.**