

Physics 380 Thermal and Statistical Physics  
Fall Semester 2008

Instructor: Dr. Dennis C. Henry

Office: Olin 213

Textbook: Statistical Physics (Second Ed.) by F. Mandl, (Wiley, 1988)

Office Hours: MWF 10:30-11:20 AM; Tuesday 9:00- 9:50; chapel and other times by appointment

### Course Description and Objectives

In this course we develop the laws and concepts of equilibrium thermodynamics and both classical and quantum statistical mechanics from the microscopic dynamics of many-particle systems. We apply the theory to black body radiation, heat capacities and electronic properties of solids, low temperature physics, white dwarf stars, Bose-Einstein condensates and other important systems. This course builds on the introduction to thermodynamics presented in PHY-220 Classical Physics II, on the introduction to quantum theory and statistical physics from PHY-260 Modern Physics, and on an understanding of topics in analytical mechanics from PHY-300 Mechanics. Multivariable calculus and partial derivatives are used throughout. This course is designed to prepare students for further studies in theoretical and experimental physics, materials science, and electrical and mechanical engineering.

### Course Policies and Evaluation

- Class Meetings:** The class will meet three times per week for lecture, class discussion, homework review, and exams. **Students will be expected to read the assigned text sections before coming to class, and will be held responsible for informing themselves of all announcements and assignments made in the classroom and via e-mail.** Regular and prompt attendance at all class meetings is expected. Students must advise the instructor in writing during the first week of class of any scheduled athletic, music, or other college activities that will require their absence during the semester. Such written notice does not imply a waiver of course requirements or an agreement to reschedule exams or due dates for assignments.
- Homework:** Problems will be assigned on a chapter basis and will be graded by the instructor. Late homework will be accepted at the discretion of the instructor, with some reduction in credit. Homework is an individual, not a group assignment. No significant collaborations on homework are permitted. Evidence of significant collaborations may result in deductions in recorded credit and application of the College's Academic Honesty policies. Students are encouraged to consult the instructor with questions about homework problems or interpretations of Academic Honesty.
- Exams:** There will be three one-hour exams and a two-hour comprehensive final exam. There will be no separate mid-term exam.
- Evaluation:**

Hour exams	55%
Final exam	25%
Homework	20%

Assignment of the final letter grade will also take into account the instructor's subjective evaluation of the student's attendance, class preparation and participation, thoroughness, pattern and quality of independent work, and evidence of improvement.

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