Physics 435: Thermodynamics and Statistical Mechanics

Fall 2016

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| Instructor: | Office Hours |
| Dr. Brad Hinaus  B-207 Sciences Bldg.  Phone: 346-4872  E-mail: bhinaus@uwsp.edu | Tuesday &Thursday 10-11  Monday and Wednesday 11-12  Friday 10-11  Also when my office door is opened. Note: I will not answer questions 1 hour before homework is due. |

Meeting Times: TRF 9:00 PM A-109 Sciences

Text: *Concept in Thermal Physics* (2nd Edition) by S.J. Blundell and K.M. Blundell. Published by Oxford University Press 2010

Recommended Books:

1. Any introductory physics book.
2. *CRC Standard Mathematical Tables and Formulae, 31st Edition* (or any other edition). By Daniel Zwillinger.

OR

*Pocket Book of Integrals and Mathematical Formulas, Third Edition* by [Ronald J. Tallarida](http://www.amazon.com/exec/obidos/search-handle-url/index=books&rank=relevancerank&field-author-exact=Ronald%20J.%20Tallarida/104-7047296-7082349)

General Information: This class is designed to give an introduction to both thermodynamics and statistical mechanics. Attendance in class is, of course, optional, but recommended. Reading and homework assignments will be announced in class during the semester.

Grading: Grades will be based on homework and exams.

* Homework: Your total homework grade will be worth 25% of your total grade in the class. Homework will be assigned on a weekly basis and must be turned in on time. Late homework will not be accepted.
* Exams: There will be 3 exams during the semester. They are tentatively scheduled for the following times, but the dates and times may be changed as announced in class. Each exam is worth 25% of your final grade in the class.

Times To Be Determined

* Course Schedule – We will cover the following chapter in order:

Chapter 1 Introduction

Chapter 2 Heat

Chapter 3 Probability

Chapter 4 Temperature and Boltzmann Factor

Chapter 5 Maxwell Boltzmann Distribution

Chapter 6 Pressure

Chapter 11 Energy

Chapter 12 Isothermal and adiabatic Processes

Chapter 13 Heat Engines

Chapter 14 Entropy

Chapter 16 Thermodynamic Potentials

Chapter 17 Rods, Bubbles, and Magnets

Chapter 19 Equipartition of Energy

Chapter 20 The Partition Function

Chapter 21 Statistical Mechanics an Ideal Gas

Chapter 29 Bose Einstein and Fermi Dirac distributions

Chapter 30 Quantum Gasses and Condensates

**Some Comments on the Homework**

The homework is assigned to give you practice using the concepts we discuss in class. In order to get the most out of the homework and the class here is some advice:

* 1. Start the homework early. Look through the problems early on so you can see which ones may be more difficult
  2. Come to office hours (or stop by other times) to ask questions. Unlike lower level classes, we don’t get a discussion section. You need to take full advantage of office hours – earlier is better. If available I will answer questions a few hours before the homework is due, but I will not answer question 1 hour before class. Also, last minute questions rarely give you enough time to actually do the problem.
  3. Homework is turned in at the start of class on or before the date it is due. Late homework is not accepted.

**Formatting of Homework**

* Show your work. It is not enough to have the right answer. You need to demonstrate you know how to get the right answer. Also, I cannot give partial credit if no work is shown.
* Homework should be written clearly and legibly. Please keep in mind that you are trying to demonstrate your understanding of the problem so using explanatory sentences, labels, drawings if appropriate, are encouraged.
* **Always** start a problem on a new page. Some problems will take more than one page, but even though some problems are short, I only want **one problem per page**. Do not cram as many problems on a page as possible. If I have trouble reading or finding the problems, I will not grade them.
* Turn in problems on paper that does not have fringes. Make sure that your homework is stapled. If it is not, there is no guarantee that all pages of your homework will be graded.