Thermodynamics and Statistical Mechanics, **Physics 4420**  
Spring 2013  
CII 3051, **T,F 8:00am-9:50am**

**instructor:** Gyorgy Korniss  
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**TA:** Pan Zhu, zhup2@rpi.edu  
**office hours:** M, R: 4-5pm, Science Center 1st floor, HBH

**pre-requisite:** PHYS 2110 (or PHYS 2510), MATH 2400, MATH 2010.

**course objective:** Learning fundamental concepts and developing problem solving skills in thermodynamics and statistical mechanics

**learning outcomes:** Students will be able to employ fundamental physics concepts and theories to set up and formulate problems in thermodynamics and statistical mechanics. Students will be able to apply differential and integral calculus, differential equations, and elementary concepts from probability theory to solve problems in thermodynamics and statistical mechanics.

**text:** Ashley H. Carter, *Classical and Statistical Thermodynamics* (2001)

**grading:** 40% homeworks; 60% exams (15%, 15%, 30%).
The first two exams are two-hour tests during regular class time, tentatively scheduled as:
**Test I:** March 5 (in class, regular class time)  
**Test II:** April 30 (in class, regular class time)  
**Final (cumulative): final's week, (scheduled by the registrar)**

There will be no grade modifiers used in this course.

I plan to stick to the exam and course schedule as posted, but if for some reason I make some changes, I’ll change the postings, and will notify everyone through the e-mail list.

**Graded material:**
It is your responsibility to pick up all returned and graded HWs and exams, and to bring any discrepancies/contests to my attention. No contests will be considered after a week following the return of the material. Further, you must keep all your graded HWs and exams until the end of the semester in case there are any clerical errors in entering your grades into the spreadsheet.

**Make-up exams:**
There are no make up exams. If you have a valid excuse (official letter from Dean of Students or Office of Student Experience), you’ll be excused from the exam. Your overall score will be based on the remaining exams (appropriately renormalized). There are ample opportunities (2 midterms, 1 final, HWs and in-class activities) to show your true potential in the remaining exams, HWs, and activities.
**Lectures (and in-class activities):**
I do not take attendance roll in the lectures. But there will be a number of short quizzes/problems unannounced for some extra credit (up to 5% of your overall course total). Besides, I think the most important source for the covered material is the lecture, your own notes, so I think it is extremely important that you show up, listen, take notes, and ask questions.

**Homework assignments:**
Regular homework assignments are taken from the textbook and will be posted on the course website on the lecture/HW schedule. Homework is due on the date indicated, at the start of class at 8am. Late homework will not be accepted without prior approval from the instructor.

**Covered material:**
The principles and physical applications of classical thermodynamics are developed. Basic concepts in classical and quantum statistical mechanics are introduced and their relations to thermodynamics are developed.

**List of topics:**

**Academic Integrity Policy:**
Academic integrity is one of the cornerstones of RPI. Students taking courses at RPI have a right to expect that their work will be evaluated fairly with respect to other students. They have a right to expect that other students will not attempt to enhance their own grades or the grades of their friends by cheating. Professors have a right to expect that their students are honest and submit work reflecting their own efforts. In an atmosphere of academic integrity, students and professors are on the same team trying to achieve the same learning objectives.

Collaboration and discussion is allowed and encouraged in the homeworks and in-class activities. However, you must write-up your own solution, as the results of synthesizing discussions with others, and not merely copying others’ solutions. On exams, you’re on your own and not allowed to discuss anything with your classmates. Thus, don’t copy someone else’s homework, in-class activities, and don’t cheat on exams. If I suspect you of either, I’ll ask for an explanation. If your explanation is unsatisfactory, you’ll be given a grade of 0 (zero) and reported to the Dean of Students. If this happens more than once, you will be given an F for the course, and the entire matter will be forwarded to the Dean of Students.