CHEM 2011 — Introduction to Thermodynamics
Course Outline, Fall 2013

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<u>Teaching assistants</u>: Moriam Ore, 351 PS; Mohammed Nazari, 345 PS; and Fletcher Agostino, 345 PS.

<u>Required Text</u>: Thermodynamics, Statistical thermodynamics, and Kinetics, by Thomal Engel and Philip Reid (Pearson Prentice Hall) 3rd edition (2013)
ISBN-10: 0-321-76618-0 or ISBN-13: 978-0-321-76618-2

Physical Chemistry (PC), by the same authors, contains all of "Thermodynamics, Statistical thermodynamics, and Kinetics" (and it has chapters on Spectroscopy and Quantum Mechanics in addition). It is perfectly suitable for the course.

<u>Lectures</u>:   Vari Hall A, Tue/Thu 10:00–11:20
<u>Tutorial</u>:   ACW 206, Monday: 11:30–12:20
<u>Office hours</u>: Petrie 303, Mon/Tue/Thu 12:30-13:30, or by appointment.

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<u>Topics covered</u>: calculus (review), heat, work, energy, equilibrium, reversibility, enthalpy, state functions, thermochemistry, entropy, free energy, chemical potential, activities, effect of temperature and pressure on equilibria, phase equilibria, surface tension. This corresponds *roughly* to chapters 1 to 6 plus part of chapter 8.

Evaluation

<u>Calculus test</u>:	10%	**positive contribution**
<u>Three tests</u>:	60%	(20% each)
<u>Final exam</u>:	40%	(or 60%, or 80%, or 100%, whichever works to your advantage, see below)

The **Calculus test** will be held **next week, Thursday September 19**. It will test only the basics of what's covered in a standard 6-credit calculus course (MATH 1013/1014 or equivalent), and it will count toward your final grade only if your mark is better than the average of your marks in all other tests. In other words, what you will get on your calculus test can not lower your overall mark in the course, it can only increase it (positive contribution).

The three other **tests** will be 40 minutes long and worth 20 marks each. They will be held during class time on **Tuesday October 1**, **Tuesday November 5**, and **Thursday November 28** (dates to be confirmed).

The **final exam** will consist of 4 parts. Parts #1, #2, and #3 will be worth 20 marks each and will test the same material as Tests #1, #2, and #3, respectively: Part #1 of the final exam

and Test #1 will test what we cover in September, Part #2 of the final exam and Test #2 will test what we cover in October, Part #3 of the final exam and Test #3 will test what we cover in November. Part #4 of the final exam will be worth 40% and will cover all of the material. **The numerical grade in the course** will be calculated by adding four marks:

⋆ your mark in test #1 **or, if is better,** your mark in the 1st part of the final, out of 20;

⋆ your mark in test #2 **or, if is better,** your mark in the 2nd part of the final, out of 20;

⋆ your mark in test #3 **or, if is better,** your mark in the 3rd part of the final, out of 20;

⋆ your mark in the 4th part of the final exam, out of 40.

If this numerical grade is lower than what you got on your calculus test, I will replace 10% of your grade by your calculus test mark out of 10 (positive contribution).

If you miss a test, you will have zero on that test. I will not look at excuses or notes from doctors or others. If you missed all the tests, you would get zero on all of them: then, your final exam would be worth 100%. I strongly advise that you write all the tests. You have nothing to lose. Writing the tests gives you two chances to show that you know the material and earn marks for it.

Organization of the course

Here's what I expect from you and what I think you will have to do to get C or better in the course: (a) you attend lectures and tutorials regularly; (b) you participate during the lectures (by trying to solve in-class problems that I will assign); (c) you write all the tests; (d) you spend roughly 2 hours studying and working on assigned problems for every lecture hour.

Here's what I will try to do in class. I will: (a) focus on concepts and the most difficult things; (b) skip definitions, examples, and numerical problems, or go over them quickly; (c) put up questions or problems in class, from time to time, and I will let you work on it for a few minutes before moving on; (d) regularly assign questions and problems from the book; (e) make sure that *many* (not all) of the tests' questions are nearly identical to questions we did in class or in assignments.

I will not present anything that is not covered in the book, but of course I could explain things a bit differently or give different questions or examples.

You may want to take some notes during class. But your lecture notes can only supplement the book, they are no substitute for it.

I will *not* post my lecture notes on the Web. Here's why. The book is more complete and accurate than any set of notes I could generate. Having a set of lecture notes from me could give you a false sense of security, or a wrong notion that classes are not important. I do not want to spend my time preparing web-ready figures — the blackboard is a lot easier to use and works just fine. I keep changing my lecture notes as I go along, and I can not afford the time to update my Web pages to ensure consistency with what I show in class. You do not have to copy my notes during lecture. In fact, I discourage you from doing that. My notes are excerpts from the book; I will give the book's page numbers corresponding to each slide I show in class so that you can follow.

The *tutorials*, on Monday, will be to answer your questions and help you with the assigned problems.