CHEM 162 - Thermodynamics and Kinetics
Spring 2015, MWF 8:30-9:20, Cook B-112
Prof. W.R. Leenstra

Introduction
Chem 162 is the second half of the year-long course in physical chemistry and covers the disciplines of thermodynamics and kinetics (and an introduction to statistical mechanics if time allows). Whereas the preceding course, Chem 161 - Quantum Chemistry, looks at chemistry from the ground up (electrons to atoms to molecules), in this course we will explore a variety of chemical properties from a macroscopic perspective. The topics themselves are expansions on ones introduced in the first-year course in chemistry.

Textbook
th ed.).
We will aim to cover Part I: Thermodynamics (Chapters 1-8) and Part III: Kinetics (Chapters 18-19). As those who have taken the first semester know, there typically is much more material in these chapters than can be reasonably covered; this is also true in the second semester. While this textbook was chosen for its clear writing style and because it appears to align with my pedagogic approach, you should understand that for most upper level courses the textbook is an
ious sub-topics will not be covered in
class (or the reverse). The rule of thumb to use in this course is that if a concept is not discussed

responsible for all material discussed in class. Also, be aware that much of the content may be presented by me differently from the way the author has done a given topic. Occasionally I may copy passages out of other books when such might be helpful as an additional resource for you.

Minor, Prerequisites, Preparation
Chem 162 is one of the courses that can be used to fulfill the minor in Chemistry, after a year of organic chemistry. One other option, this spring semester, is Chem 131 (Inorganic Chemistry). The difference lies in the prerequisites. Whereas Chem 131 requires a year of organic chemistry, this course in physical chemistry requires a year of physics instead, plus a year of calculus. Chem 162 does not include extensive integrations or differential equations as does Chem 161, thus, only the one year of calculus (Math 21/22) is sufficient. As you would see in a cursory inspection of the first few chapters of our textbook, you would be quite lost without that one year of calculus already mastered. One other option is Chem 121 (Quantitative Analysis), offered next fall semester.

Topics
The topics, in order of discussion, are:

Zeroth law and equations of state [ideal/real gases,]
First law of thermodynamics [heat and work, thermochemistry]
Second law of thermodynamics [Carnot cycle, entropy]
Chemical equilibrium [

Course Grading

Assessments will be carried out in three different categories: semester exams, homework, and final exam, with point assignments of 300, 100, and 200, respectively. These are:

Semester

Grade. Your grade for the course will be based on the total number of points you accumulate out of 600, relative to the class average. Thus, there is no meaningful letter grade that can be assigned to any individual exam. I can only indicate approximate ranges base
Although I cannot at this time predict the difficulty of the exams and the overall strength of the class, but I can say that the average score for the course has always been around 65-70%. In a large statistical sample, for this course the average performance earns a B. But please note that the average could also be a little lowerttle