CHEM 584 Syllabus (Fall 2004)
TTh 9:25 – 10:40

Course Title: *Thermodynamics & Kinetics I*
Instructor: *Dr. Jeffry D. Madura*
Office: *Mellon Hall, Room 308 or 320*
Office Hours: *TTh 10:40 –11:30 a.m. or by appointment*

Textbook: *Molecular Driving Forces: Statistical Thermodynamics in Chemistry and Biology* by Ken Dill and Sarina Bromberg, Garland Science, 2002. (required)
Mathematical Methods for Scientist and Engineers, Donald McQuarrie, University Science Books, 2003. (required)

Reading assignments from the literature will also be given. Suggested books include:

- Atkins, Peter: Physical Chemistry 6th edition
  - This provides a nice review of basic physical chemistry.
- Klotz, I. M.;Rosenberg, R. M.: Chemical Thermodynamics 6th edition
  - Good review of basic thermodynamic theory and methods.
- Ben-Naim, Arieh: Statistical Thermodynamics for Chemists and Biochemists
  - Graduate level introduction to the application of statistical thermodynamics by chemists, biologists, and biochemists.
- Lewis, G. N., Randall, M. Thermodynamics
  - More advanced book on thermodynamics. Covers mostly classical thermodynamics.
- Connors, K. A. Chemical Kinetics: The study of Reaction Rates in Solution
  - Covers the area of solution chemical kinetics
- Ben-Naim, A.:Hydrophobic Interactions
  - This book covers mainly the study of the thermodynamic aspects of hydrophobic interactions.
- Tanford, C.:The Hydrophobic Effect: Formation of Micelles and Biological Membranes
  - Attempts to provide a comprehensive account of the hydrophobic effect.
- Steinfeld, J. I., Francisco, J. S., and Hase, W. L.: Chemical Kinetics and Dynamics
  - The focus of this book is on the interconnections between phenomenological chemical kinetics and molecular reaction dynamics.
- Van Holde, K. E., Johnson, W. C., Shing Ho, P. Principles of Physical Biochemistry
  - A textbook that provides a solid background in molecular structure and dynamics, providing a proper context for experimental approaches.
- Bergethon, P. R.: The Physical Basis of Biochemistry: The Foundations of Molecular Biophysics
  - This textbook's objective is to provide a unifying approach to the study of biophysical chemistry.

Exams: Two exams will be given, a midterm and a final (60%). The exam dates are listed in the calendar of this syllabus. Weekly assignments will be given throughout the semester (40%). Class participation will be 10% of the grade.

Class Days We will meet every TTh, except the following days marked on the calendar.

Homework: Several homework assignments will be assigned, collected and graded during the semester. **There will be no make-up or re-grades to the homework assignments.** The following instructions must be done in order to have any problem graded. If these instructions are not obeyed then the problem will not be graded and zero credit be given.

- Each problem must start on a new sheet of paper.
- The problem must be clearly and neatly worked out with sufficient detail describing what you have done.
- The answer must be clearly identified by highlighting it with a yellow marker.
- All pages of the homework need to be numbered starting with 1 and ending with the last page numbered.

BlackBoard: I will use BlackBoard in this class as a mechanism for posting announcements, notes, papers, solutions to assignments, and grades. You are responsible for knowing how to access BlackBoard and using it. If you have any questions about BlackBoard please see me.

Calculator: This class is a mathematics based course. I recommend that you make use of CAS (Computer Algebra System) based calculator to assist you in solving many of the problems we will encounter throughout the semester. I have found that the TI-89 series of calculators will do most of the calculations and manipulation that we will do in this class. There are other calculators that can do the same thing and you are welcome to use them. It is important that you know the operation of your calculator so that you can make efficient use of it on your homework and during an examination. Periodically I will provide examples in class on how to use the TI-89 calculator to solve various problems. I may or may not know how to use other types.

Disability: Any student with a qualified disability that requires special accommodations should inform the instructor as soon as possible so that arrangements can be made.

Tentative Schedule of Lectures and Exams

August 2004

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24 Ch 1 Lecture 1	25	26 Ch 2 Lecture 2	27	28
29	30	31 Ch 3 Lecture 3				

September 2004

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2 Ch 4 Lecture 4	3	4
5	6 Holiday No Class	7 Ch 5 Lecture 5	8	9 Ch 6 Lecture 6	10	11
12	13	14 Ch 7 Lecture 7	15	16 Ch 8 Lecture 8	17	18
19	20	21 Ch 9 Lecture 9	22	23 Ch 10 Lecture 10	24	25
26	27	28 Ch 11 Lecture 11	29	30 Ch 12 Lecture 12		

October 2004

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3	4	5 Exam I	6	7 Ch 13 Lecture 13	8	9
10	11	12 Ch 14 Lecture 14	13	14 Ch 15 Lecture 15	15	16
17	18	19 Ch 16 Lecture 16	20	21 Ch 17 Lecture 17	22	23
24	25 No Class	26 Ch 18 Lecture 18	27	28 Ch 18 Lecture 19	29	30
31						

November 2004

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1 Holiday No Class	2 Ch 19 Lecture 20	3	4 Ch 19 Lecture 21	5	6
7	8	9 Ch 20 Lecture 22	10	11 Ch 21 Lecture 23	12	13
14	15	16 Ch 22/23 Lecture 24	17	18 Ch 24/29 Lecture 25	19	20
21	22 Holiday No Class	23 Holiday No Class	24 Holiday No Class	25 Holiday No Class	26 Holiday	27
28	29	30 Ch 30 Lecture 26				

December 2004

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2 Exam II	3	4
5	6	7 Monday Schedule	8 Holiday No Class	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	