CHEM 3610
Physical Chemistry I
Fall, 2019
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INTRODUCTION	
Tues Sept 10	Introduction to Thermodynamics, Calculus review
Thurs Sept 12	Real and ideal gases (Chapter 1)
THERMODYNAMICS - THE FIRST LAW (Chapters 2-4)	
Tues Sept 17	Work, heat and the first law of thermodynamics
Thurs Sept 19	Heat capacities, impact on biochemistry and materials science
Tues Sept 24	Understanding thermochemistry &, impact on biology and biochemistry
Thurs Sept 26	State functions and exact differentials, changes internal energy & the Joule-Thomson effect, applications
Tues Oct 1	**Discussion and review**
Thurs Oct 3	**Exam #1**
THERMODYNAMICS - THE SECOND LAW (Chapters 5 and 6)	
Tues Oct 8	The direction of spontaneous change, entropy, & the second law of thermodynamics
Thurs Oct 10	ΔS for processes involving gases, phase transitions, and chemical reactions, entropy & probability, the third law of thermodynamics
Tues Oct 15	Concentrating on the system, predicting spontaneous processes: Gibbs & Helmholtz energies - (Thermodynamics in a Nutshell)
Thurs Oct 17	Combining the 1st and 2nd Laws, Properties of the internal energy, properties of the Gibbs energy, applications (biology, environmental science)
APPLICATIONS OF THERMODYNAMICS (Chapters 8)	
Tues Oct 22	Phase diagrams for pure substances, applications to biology and biochemistry
Thurs Oct 24	Thermodynamic description of mixtures, chemical potentials, ideal solutions, impact on biology and polymer science
Tues Oct 29	**Discussion and review**
Thurs Oct 31	**Exam #2**
Tues Nov 5	Properties of solutions, activities, applications to biology
Thurs Nov 7	Phase diagrams for two component systems, impact on materials science and biology
Tues Nov 12	Chemical equilibrium & spontaneous reactions; Effect of pressure, temperature, pH, and catalysts on K_{eq}

| Thurs Nov 14 | Equilibrium electrochemistry, impact on biochemistry |
| Thurs Nov 21 | **Final Exam** |

Homework
Homework is very important since confidence in the subject can only be gained by working problems. Although the approach to and solutions of each problem should be your own, you may discuss the problems with your classmates.

Reading Assignments
The reading assignments are designed to prepare you for lectures and worksheets. Please bring questions on the reading to class. I will spend some time during the lecture portion of each class answering questions about the reading. Furthermore, it will be exceedingly difficult to complete the worksheets if you don't do the reading.

Attendance
Attendance is not mandatory; however, to get full credit for group work you must attend. For unexcused absences, your group grade will be adjusted to reflect the percentage of classes missed. For example, if 3 of 15 classes are missed, then you group grade will be reduced 20%.

Peer Review
During the quarter, you will fill out an evaluation sheet for each member of your group and they will in turn evaluate you.

Grading Scheme

Individual Work	Group Work	Grading		
Homework – 5%	Worksheets – 15%	93-100A	90-92A-	
Computational Work – 5%		87-89B+	83-86B	80-82B-
Exam I – 25%		77-79C+	73-76C	70-72C-
Exam II – 25%		67-69D+	63-66D	60-62D-
Final Exam – 25%		<60F		