CHM 6430 – Chemical Thermodynamics (F17)

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Description: This course covers the basic concepts of chemical thermodynamics and kinetics. It is expected to be useful to all students who will use physical chemistry concepts in their research, and it can be beneficial as a refresher.

Lecture: MWF Period 3 (9:35 – 10:25 AM), LEI 242

Office Hours: M 10:30 – 11:30, W 10:30 – 11:30, or by appointment
I am generally available to answer questions via email

Course Website: This course has a Canvas page for notes, answer keys and announcements

Textbook: Recommended: "Physical Chemistry, 10th Ed." By: Atkins and de Paula

Recommended: "Thermodynamics and Chemistry, by Howard Devoe, 2nd Edition, Version 8 (2016). http://www2.chem.umd.edu/thermobook/ (free download)

There are a number of Physical Chemistry books on the market. These books are a suggestion, but any book should be sufficient. Please let me know if you have any questions about possible textbooks.

Midterm Exams: There will be 3 midterm exams. The tentative dates for the midterms are September 22nd, October 27th and December 1st. Doing well on midterm exams requires mastery of qualitative, conceptual material.

Final Exam: The final exam is scheduled for Wednesday December 13th from 3:00 – 5:00PM. The final exam is cumulative.

Grading: Your final grade will be determined from the following

Homework Average = 30%
Exam Average = 70%

Approximate Grade Ranges:			
> 90	A	69 - 72.99	C+
86 - 89.9	A-	64 - 68.9	C
82 - 85.9	B+	60 - 63.9	C-
77 - 81.9	B	56 - 59.9	D+
73 - 76.9	B-	50 - 55.9	D
		< 50	E

Makeups: There will be no makeup exams unless prior arrangements are made. If an exam is missed for an excused reason, the final exam score will be used in the exam calculation. Homework assignments that are turned in late will not be accepted unless prior arrangements have been made.

Philosophy: Physical chemistry is concerned with the **quantitative** description of natural phenomena. The homework is designed to have you interpret experimental data – if you were going to go into the laboratory, what would you measure and how would you treat the data? The midterm exams are intended to gauge mastery of basic concepts and elementary calculations or derivations. It is not a good idea to leave studying until the night before the exam. It takes time to grasp some of the concepts of physical chemistry and to work through the problems. 'Cramming' is not the way to be successful in this course. Working in groups is strongly encouraged, but copying another student's work will not be tolerated.

Attendance: Lecture attendance is essential for your success in this class. 100$ attendance is expected. If you have a documented issue that requires you to miss, please let me know as soon as possible.

Disabilities: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter, which must be presented to the instructor when requesting accommodations. Students with disabilities should follow this procedure as early as possible in the semester.

Counseling: The University of Florida provides counseling services for students, staff, and faculty. See http://www.counsel.ufl.edu/ or call (352) 392-1575 during regular service hours (8am – 5pm). For other hours or on weekends call the Alachua County Crisis Center (264-6789). Students may also call the clinician on-call at Student Mental Health for phone callback and consultation at (352) 392-1171.

Cell Phones: Please put all cell phones and other digital devices on "silent mode" during all class periods. During exams, your cell phone must be placed on the table in front of you, face down, for the entire test period.

Honor Code: This class will operate under the policies of the student honor code, which can be found at: http://www.registrar.ufl.edu/catalog/policies/students.html. The students, instructor, and TAs are honor-bound to comply with the Honors Pledge: ***We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.***

Objectives: By the end of this course you should be able to:

- Analyze, graph, fit and interpret experimental data
- Perform elementary derivations and manipulations on equations of state
- Understand the relationships between different thermodynamic functions
- Understand the criteria for equilibrium or spontaneity for chemical processes under different sets of conditions
- Calculate thermodynamic and equilibrium quantities for a variety of chemical processes and reactions
- Analyze and interpret phase diagrams for 2 and 3 component mixtures
- Derive rate laws for complex reaction mechanisms
- Understand how microscopic properties of matter translate to macroscopic thermodynamic properties

Tentative Lecture Schedule:

	Week	M	W	F
Aug	**21**	No Class (ACS)	Gases	
	28		First Law	
Sept	**4**	Labor Day		
	11	Entropy, Second Law		Third Law
	18	Chemical Equilibrium		
	25	Physical Equilibrium		Exam 1
Oct	**2**	Mixtures		
	9			Homecoming
	16	Phase Diagrams		
	23			
	30	Kinetics		Exam 2
Nov	**6**	Mechanisms		Veterans Day
	13			
	20	TS Theory	Thanksgiving	Thanksgiving
	27			**Exam 3**
Dec	**4**	Polymer Mixtures		Reading Day