CHM 6430 – Chemical Thermodynamics (F19)

Instructor: Daniel Savin, 318 Leigh Hall (LEI), savin@chem.ufl.edu, 352-392-9150

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

Lecture: MWF Period 2 (8:30 – 9:20 AM), FLI 109

Office Hours: W 9:30 – 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: "Thermodynamics and Chemistry, by Howard Devoe, 2nd Edition, Version 8 (2016). http://www2.chem.umd.edu/thermobook/ (free download)

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

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 1 midterm exam. The tentative date for the midterm is on October 12th. Doing well on midterm exams requires mastery of qualitative, conceptual material.

Final Exam: The final exam is scheduled for Thursday December 11th from 12:30 – 2:30PM. The final exam is cumulative.

Grading: Your final grade will be determined from the following

Homework Average = 40%
Exam 1 = 25%
Exam 2 = 35%

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, 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 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	19	No Class	Gases	
	26	No Class (ACS)	No Class (ACS)	First Law
Sept	2			
	9	Entropy, Second Law		Third Law
	16	Chemical Equilibrium		
	23	Physical Equilibrium		Mixtures
	30			Homecoming
Oct	7	Phase Diagrams		Exam 1
	14	No Class (CCS)	No Class (CCS)	No Class (CCS)
	21	No Class (CCS)		
	28			
Nov	4	Kinetics		Mechanisms
	11	Veteran's Day		
	18		TS Theory	
	25		Thanksgiving	Thanksgiving
Dec	2	Polymer Mixtures		Reading Day
	9		Final Exam Thursday (12/12) 12:30-2:30	

- This schedule is subject to change. There are some lecture periods where I will be out of town. Video lectures for these days will be posted on Canvas; you will be responsible for the material covered in these lectures.