CHM 4411 – Physical Chemistry, Thermodynamics and Kinetics (S21)

Instructor: Dr. Daniel Savin (Prof. S)

Office: 318 Leigh Hall (LEI), 352-392-9150

Email: Via Canvas (preferred), savin@chem.ufl.edu

Office Hours: TBA, or by appointment
I am generally available to answer questions via email

Please note that masks will be required for in person meetings with Prof. S.

Lecture: T R Periods 2-3 (8:30 – 10:25 AM), LEI 207

TA: Richard Xue, jinzexue@chem.ufl.edu

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

Textbook: Recommended: "Physical Chemistry, 11th Ed." By: Atkins and de Paula
There are a number of Physical Chemistry books on the market. This book is a suggestion, but any book should be sufficient. Please let me know if you have any questions about possible textbooks.

Assessments: Research has shown that assessing grades through a few, high-stakes, activities (e.g., exams) is not the best way to foster deep learning or long-term retention of concepts. Therefore, this course will attempt to have no midterm exams. Course grades will come primarily from two types of assessments: Concept Quizzes (47% of your final grade) and Homework (43% of your final grade. There will be a cumulative final exam (10% of your final grade) with the intention of having you review basic concepts in the course.

Concept Quizzes (Q): There will be 14 Concept Quizzes throughout the semester, of which the top 13 scores will count towards your final grade. Concept Quizzes are administered online through the Canvas site and are intended to cement basic concepts and ideas. The material for these quizzes will come from notes and lecture material and may cover basic calculations, interpretation of data, explanations of physical phenomena, etc. ***These are individual assessments, and the problems must be worked and submitted alone.*** Quizzes will be submitted with the following pledge implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." Violation of this instruction will result in a violation of the Honor Code (vide infra).

Homework (H): There will be 13 homework assignments throughout the semester, of which the top 12 scores will count towards your final grade. Homework assignments are intended to be challenging, data-driven problems to evaluate your skill and cement your mastery of the course material. The assignments should be presented in a **professional** manner, with the work, derivations, assumptions, and explanations presented **clearly**. Most of the homework assignments involve interpretation of experimental data. When preparing graphs, you ***must*** use Excel or a comparable graphing program. If you are doing a curve-fit,

you ***must*** justify the choice of fitting function. While you are strongly advised to work in groups, **you must turn in your own original work to receive any credit!** You must also reference the other members of your study group. Failure to adhere to these requirements will result in zero credit for the assignment.

Academic Integrity: If there are numerous violations of the Honor Code, the course grades will be determined using an alternate grading scheme. In this alternate scheme, Quizzes will cover 24% of your final grade, Homework will cover 21% of your final grade, with the rest will come from a high-stakes final exam (50% of your final grade). It is in your best interest to maintain the highest level of integrity in this course.

Final Exam: The final exam (10% of the final grade) is scheduled for April 25th from 10AM – 12 PM. This exam is cumulative but will be mostly conceptual. Topics will come primarily from the Concept Quizzes but will also include definitions, brief explanations, and interpretation of data.

Grading: Your final grade will be determined from the following

Concept Quizzes = 47%
Homework = 43%
Final Exam = 10%

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

Tentative Lecture Schedule:

	Week	Tues	Thurs
Jan	3	No Class	Focus 1
	10	Q1	Focus 2, H1
	17	Q2	H2
	24	Focus 3, Q3	H3
	31	Q4	H4
Feb	7	Focus 4, Q5	H5
	14	Q6	Focus 5, H6
	21	Q7	H7
	28	Q8	H8
Mar	7	Spring Break	Spring Break
	14	Focus 6, Q9	H9
	21	Focus 17, Q10	H10
	28	Q11	H11
Apr	4	Focus 18, Q12	H12
	11	Focus 19, Q13	H13
	18	Focus 16, Q14	Reading Day
	25	**Final Exam**	**Apr 25 10AM-12PM**

Additional Important Information:

1. **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.

2. **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

3. **Honor Code.** This class will operate under the policies of the student honor code which can be found at: https://sccr.dso.ufl.edu/process/student-conduct-code/. 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. You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks. Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. If you have any questions or concerns, please consult with Prof S.

4. **Attendance and Etiquette.** Lecture attendance is essential for your success in this class. However, I will not take roll. Repeated absence in class will make it very difficult to keep up with the course material. Your polite, courteous, and civilized behavior is expected in all aspects of our course. This holds especially true in these times of stress and uncertainty.

5. **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.

6. **Recording of Lectures.** All lectures during the TR Period 2-3 class time will be recorded, and the content will be made available through the Canvas page.

   In addition, students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

   A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

   Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code. Class recording policies can be found at: http://aa.ufl.edu/policies/in-class-recording/

7. **Re-grades.** Any requests for re-grading a quiz or homework assignment must be made within 48 hours of the grade being posted on Canvas and handed back during lecture or office hours. Regrades will be performed on the entire assignment following the standard assignment rubric, so grade adjustments may be positive or negative.

8. **Disabilities.** Students with disabilities requesting accommodation should first register with the Disability Resource Center (352-392-8565, http://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 accommodation. The student is responsible for scheduling the exam dates with the DRC. Students with disabilities should follow this procedure as early as possible.

9. **Counseling.** The University of Florida provides counseling services for students, staff, and faculty. See http://www.counseling.ufl.edu/. If you or a friend are in distress, call (352) 392-1575 (available 24/7), or email umatter@ufl.edu. Alternatively, call the Alachua County Crisis Center, (352) 264-6789. For sexual assault recovery services call the Student Health Care Center at (352) 392-1161. For life-threatening emergencies always call 911.

10. **Emergency Numbers and Web Sites**:
    - UFPD (UF Police Department): In case of emergency dial 911. The UF campus police non-emergency number is (352) 392-1111. Their web site: http://www.police.ufl.edu/,
    - UF Emergency management: (352) 273-2100. https://emergency.ufl.edu/,
    - Infirmary (student health center): (352) 392-1161, http://shcc.ufl.edu/.
    - EH&S (Environmental Health & Safety): (352) 392-1591, http://www.ehs.ufl.edu/.

11. **Other Academic Resources**:
    - Library Support can be obtained here: http://cms.uflib.ufl.edu/ask, where you can find various ways to receive assistance with respect to using the libraries or finding resources.
    - The Career Resource Center is located on level One in the Reitz Union, (352) 392-1601, and provides career assistance and counseling. Refer to https://career.ufl.edu/ for further info.
    - The Teaching Center is located in Broward Hall, main phone (352) 392-2010 or appointment phone (352) 392-6420, and provides students with tutoring services and counseling regarding general study skills. Refer to http://teachingcenter.ufl.edu/ for further info. It may also provide employment opportunities as tutors for well qualified students.
    - The Writing Studio is located at 302, Tigert Hall, (352) 846-1138, and provides help with brainstorming, formatting, and writing papers, see: https://writing.ufl.edu/writing-studio/.
    - The Ombuds Office is located at 31 Tigert Hall, (352) 392-1308, and provides students assistance in resolving problems and conflicts that arise in the course of interacting with the University of Florida. By considering problems in an unbiased way, the Ombuds works to achieve a fair resolution and works to protect the rights of all parties involved. For further information go to http://www.ombuds.ufl.edu/ or refer to the official grievances policy here: https://regulations.ufl.edu/wp-content/uploads/2013/03/4012.pdf.