

CHM 4411L, Physical Chemistry Laboratory Fall 2013

Instructor: Dr. Mine Ucak-Astarlioglu, CLB 220, ucakm@ufl.edu
Office Hours: M & F 11:30 AM -12:30 PM, and by appointment at CLB 220.

Teaching Assistants: Imran Iftikhar, imif6145@ufl.edu
Office Hours:

Ning Zhao, nzhao@chem.ufl.edu
Office Hours:

Sections:

07DB	M (Monday)	6-10	12:50-6:00 PM	TA: Imran Iftikhar
0821	T (Tuesday)	6-10	12:50-6:00 PM	TA: Ning Zhao

Class Meeting Times: 10:40 AM – 11:30 AM, 4th period, Fridays

Class Room: TUR 2336

Lab Meeting Times: 6th - 10th periods on M and T.

Lab Room: Lei 248

Library Room: Marston Science Library, Room 308.

Objectives: CHM 4411L focuses on measurements of thermodynamic, kinetic, and spectroscopic properties, data and error analysis of experimental data and presentation of results in written and oral form.

Texts: Ucak-Astarlioglu, M. *Experiments for Physical Chemistry*, Fall 2013, University Copy and More: Gainesville, 2013.
Williams, K.R. *Error Analysis in Physical and Analytical Chemistry*, 3rd Ed., University Copy and More: Gainesville, 2013.

Other Required: Laboratory Notebook with duplicate pre-numbered pages; safety glasses; departmentally approved attire; USB drive.

Lectures: Besides the texts listed above the material to be covered in the lectures will include:

1. Personal notes on the various experiments to be performed, safety procedures, etc. with reference to the lab manual.
2. There may also be guest speakers on various experimental topics.
3. Discussion of physical chemistry experimental techniques.

Grade Distribution:

Assignment Type	Number	Points Each	Total Points
Prelab Assignments	8	25	200
Abbr. Lab reports	5	100	500
Full Lab Reports	3	200	600
Homework	1	50	50
Notebook	1	50	50
Library Assignment	1	50	50
Oral Presentation	1	200	200
Preparedness	1	50	50
Participation - Conduct	1	50	50
Quiz	1	50	50
Total Points:			1800

Note: There are total of 9 prelabs, 6 abbreviated reports, and 4 full reports offered. However, shown number of assignments has to be submitted to earn credits towards 1800 points. You may chose not to turn in or drop the lowest score of one prelab, one abbreviated report, and one full report out of the total number of assignments provided; but you will also live with those consequences from not having feedback from grading.

Factors affecting the subjective grade will be the student's attendance record (lecture and lab), punctuality, preparation for laboratory work, laboratory technique, understanding of the experiments, and general attitude. Please see detailed information under "Subjective".

Reports must demonstrate your own understanding of the scientific work. You may not paraphrase or use other students' reports in the preparation of your own reports. Otherwise actions will be taken due to academic dishonesty.

Grading Scale in Percentages:

$A \geq 90$	$60 \leq C < 65$
$85 \leq A^- < 90$	$55 \leq C^- < 60$
$80 \leq B^+ < 85$	$50 \leq D^+ < 55$
$75 \leq B < 80$	$45 \leq D < 50$
$70 \leq B^- < 75$	$40 \leq D^- < 45$
$65 \leq C^+ < 70$	$E < 40$

Written Reports: Except for equations, full and abbreviated reports must be double-spaced typed using a minimum font size of 12 point. Equations (both mathematical and chemical) should be typed using an equation editor unless otherwise noted by the instructor. Chemical structures should be drawn by using ChemDraw. Full and

abbreviated report writing and grading guidelines should be followed as posted on Elearning website. In writing full reports you should assume that your experiment will be published in a journal and will reach numerous scientists all around the world. Therefore, you must work meticulously on its preparation. It must be an original piece of writing. Each lab report requires **8-15 hours of work** outside of class. You should use *Journal of Physical Chemistry* papers as good models for writing physical chemistry reports. Please see additional handouts for expectations and grading schemes for written reports on Elearning website.

Oral Reports: Oral report topics will be assigned to you by your instructor. Organize your talk to fit a 15-minute time block (typical length at an ACS meeting, etc.) and additional 5-minutes to answer questions. Use PowerPoint to facilitate the presentation. You should approach the oral report as a job or graduate school interview and should come suitably dressed. Save your presentation to an usb thumb drive and bring it to the conference room listed in p. 6 to give your presentation.

Quiz: There will be a quiz on instrumentation and basic data analysis.

Notebooks: Your laboratory notebook will be evaluated at the end of the semester and graded based on completeness, neatness, and adherence to the guidelines posted in Elearning website.

Library Training: It is mandatory to attend library training and complete the library assignments.

Library Meeting at Marston Science Library Room 308:

Monday, 09/23/2013	2-4 PM
Tuesday, 09/24/2013	2-4 PM

Library Guide for the course can be found at:

<http://guides.uflib.ufl.edu/chm4411>

Prelab Exercises, Collecting and Analyzing the Data Before Leaving the Lab: This will cover the background material and procedure for the day's experiment. Prelab assignments need to be turned in BEFORE the lab starts. If they are turned in within the first 20 minutes of the lab period, a grade of 50% of the earned score will be given. If they are turned in later than this time, a grade of zero will be given for that prelab assignment. Please come prepared and knowledgeable about the tasks you are going to perform. Also, it is strongly suggested that you come to the lab period with your laptop and the excel data sheet set up for your data collection and analysis. You will only be allowed to leave the lab period after the TA or instructor check your excel sheet for proper data input and analysis calculations. Essentially when you leave the lab period, the majority of the data analysis and graphing should be complete.

Subjective: Subjective has two parts: Preparedness - participation and conduct. In Preparedness evaluates student's knowledge of the experimental procedures prior to lab Participation and conduct refers to the extent of the student's contribution and involvement in performing experiment.

Late Arrival: For each time you arrive to lab late, 5 points will be deducted from my subjective grade. Note that excessive tardiness to lecture will also result in a reduction of my subjective grade. Now, if you are running behind, I would rather you still come to class. Points will only be deducted if you have a habit (ie more than 3 times) arriving late. If you are too late for the lab period you may not be admitted to that particular lab.

Cell phones: Please put all cell phones or pagers on “silent mode” and in your backpacks or purse during all class/ lab periods. No texting, internet searching, tweeting or facebook activities during lecture and lab.

Students with Disabilities: Appropriate accommodations will be provided, according to the policy at www.chem.ufl.edu/~itl/disabilities.html.

Counseling Services: 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 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.

Academic Honesty and Plagiarism: If the instructor suspects that you have copied another student’s lab report or plagiarized previous lab reports from earlier semesters, a grade of zero will be given for that assignment and disciplinary action with UF Academic Honesty Court will be pursued. Students are expected to obey the University of Florida Honor Code, detailed at www.chem.ufl.edu/~itl/honor.html. Violations will be reported to the Office of Student Judicial Affairs.

Schedule of Experiments and Reports: Each student will complete all the experiments as scheduled, submit 8 prelabs, write 3 full reports and 5 abbreviated reports, complete notebooks, library and error analysis assignments. In addition, one oral report will be presented during the laboratory periods. Written reports must be submitted to the professors or the TAs on the designated dates at the beginning of the sections. Deductions at the rate of 5% per day (including weekends) will be assessed for late work. All written work (late or otherwise) must be received by 10:40 AM on Friday, 12/09/2013.

Week #	Date (M)	Lecture (Friday, 4 th Period, 10:40 – 11:30 AM)	Experiment (M and T 12:50-6:00PM)	Report Type	Report Due Date	Hmwk/Prelab (due beginning of lab)
1	08/19	No labs, lecture only (8/23): Experimental Uncertainty				(09/02) Hmwk
2	08/26	Intro Error Analysis/ NMR	¹ HMR lab Analysis*	Abbr (TA)	2 weeks (09/09)	Prelab
3	09/02	Intro Error Analysis/ NMR	No lab Labor Day			
4	09/09	Thermo - Bomb lecture	Bomb Calorimeter	Abbr (TA)	1 week (09/16)	Prelab
5	09/16	Kinetics	Kinetics DTNB	Full (MUA)	2 weeks (09/30)	Prelab
6	09/23	Kinetics	Library Methods and Assignment (MSL 308)		(10/07)	None
7	09/30	Adsorption	Rotation 1 ² Adsorption	Full (MUA)	2 weeks (10/14, 10/21)	Prelab
8	10/07	Diffusion	Rotation 1 Conductivity	Abbr (TA)	1 week (10/07, 10/14)	Prelab
9	10/14	Phase Diagram	Phase Diagram	Full (MUA)	(10/28)	Prelab
10	10/21	Modeling	Molecular Modeling	Abbr (TA)	1 week (10/28)	None
11	10/28	IR/Raman	Rotation 2 IR	Full (MUA)	2 weeks (11/11, 11/18, 12/02)	Prelab
12	11/04	No lecture - Homecoming	Rotation 2 Raman	Abbr (TA)	(11/04, 11/11, 11/25)	Prelab
13	11/11	Time res flu	No lab – Veterans Day			
14	11/18	Quiz	Rotation 2 Time Resolved	Abbr (TA)	(11/04, 11/11, 11/25)	
15	11/25	No lecture - Thanksgiving	Oral Presentations			
16	12/02	No lecture – Reading days	Make up Week			

Rotation #1 Schedule:

Experiment Name	Adsorption	Conductivity
Report Type	Full	Abbr
Week 7 09/30	Group A	Group B
Week 8 10/07	Group B	Group A

Rotation #2 Schedule:

Experiment Name	IR	Raman	Time res flu
Report Type	Full	Abbr.	Abbr.
Week 11 10/28	Group A	Group C	Group B
Week 12 11/04	Group B	Group A	Group C
Week 13 11/18	Group C	Group B	Group A

¹Come prepared with the prelab for your assigned experiment: due at the beginning of the lab period.

²Adsorption experiment requires solution preparation one week prior to the experiment. Your prelab for the experiment you do that week is due at the beginning of the lab period.

Reports and Graders:

Kinetics (Full)	Dr. Ucak
NMR (Abbreviated)	
Phase Diagram (Full)	Dr. Ucak
Bomb Calorimeter (Abbreviated)	
Molecular Modeling (Abbreviated)	
IR (Full)	Dr. Ucak
Error Homework	
Raman (Abbreviated)	
Adsorption (Full)	Dr. Ucak
Time res flu (Abbreviated)	
Conductivity (Abbreviated)	

First Experiment Schedule: Keto Enol Tautomerism:

We will go to NMR room once we meet at the lab, LEI 248.

NMR experiments will be conducted on August 26 Monday and August 27 Tuesday from 1:00-4:00 PM. Please prepare the prelab before coming to lab.

Oral Presentations Schedule:

Monday section at CLB 414: on 11/25 from 1:00 - 4:00 PM.

Tuesday section at CLB 212: on 11/26 from 1:00 - 4:00 PM.