

CHM 4413L, Biophysical Chemistry Laboratory Fall 2012

Instructors: Dr. Mine Ucak-Astarlioglu, CLB 220, ucakm@ufl.edu
Office Hours: Mondays 11:00 AM-12:00, noon
Wednesdays 11:00 AM-12:00, noon

Teaching Assistants: Imran Iftikhar, imif6145@ufl.edu, Leigh 310
Office Hours: Mondays 3:00 PM-5:00 PM

Adam Smith, adams@ufl.edu
Office Hours: Wednesdays 9:00 AM-11:00 AM at McKnight
Brain Institute Room: LG 129.

Bhase, Hrishikesh Padmakar, bhase@chem.ufl.edu
Office Hours: TBA

Sections:

6718	W (Wed)	6-10	12:50-6:00 P	TA: Adam/Bhase
1222	R (Thurs)	6-10	12:50-6:00 PM	TA: Imran/Bhase

Class Meeting Times: 1:55 pm - 2:45 pm, 7th period, M

Class Room: Lei 207

Lab Meeting Times: 12:50 pm – 6:00 pm, 6th – 10th periods, W (6718) or R (1222)

Lab Room: Lei 248

Library Room: 1st Meeting: Marston Science Library, Room 308.

2nd Meeting: Health Science Center Library, HSCL, Room C2-3.

Objectives: CHM 4413L focuses on measurements of physical properties for biologically significant systems, including data and error analysis and presentation of results in written and oral form.

Texts: Ucak-Astarlioglu, M. *Experiments for Biophysical Chemistry*, Spring 2012, University Copy and More: Gainesville, 2012.

Williams, K.R. *Error Analysis in Physical and Analytical Chemistry*, 3rd Ed., University Copy and More: Gainesville, 2012.

Other Required: Laboratory Notebook with duplicate pre-numbered pages, safety glasses, departmentally approved attire, and 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. There may also be guest speakers on various experimental topics as announced.
2. Discussion of general biophysical chemical experimental techniques.

Grade Distribution:

Assignment Type	Number	Points Each	Total Points
Prelab Assignments	7	25	150
Abbr. Lab reports	4	100	300
Full Lab Reports	2	200	400
Homework	1	50	50
pKa Data Analysis	1	100	100
Library Assignment	1	50	50
Oral Presentation	1	100	100
Preparedness/Attendance/Subjective Grade	1	100	100
Quiz	2	75	150
Total Points:			1400

PS: You may drop the lowest score of your prelab and abbreviated report.

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.

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 SAKAI 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 may 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 Sakai.

Oral Report: 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 CLB 2nd floor Physical Chemistry Conference Room to give your presentation.

Quizzes: There will be two quizzes on the pKa data analysis and instrumentation. The quizzes are intended to be study guides in the preparation of reports and understanding of instrumentation.

Notebooks: Students should follow the writing guidelines of notebooks as can be found in 4413L SAKAI website for each experiment.

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

1st Library Meeting (librarian Ms. Donna Wrublewski):

Wednesday, September 12	2:00 PM - 4:00 PM at Library West, Room 211
Thursday, September 13	2:00 PM - 4:00 PM at Marston Science Library, Room 308

Location Information for 1st Library Meeting:

Wednesday section: LIBRARY WEST ROOM 211. Enter Library West, and take the escalator to the 2nd floor. Facing the service desk, Room 211 is on the left. (Library West, north of Marston, is between the Plaza of the Americas and University Avenue.)

Thursday section: MARSTON SCIENCE LIBRARY ROOM 308. Coming out of the elevator or stairs, 308 is right in front of you, slightly to your left.

2nd Library Meeting (librarian Dr. Michelle Tenant):

Wednesday, October 31	2:00 PM - 4:00 PM at Health Science Center Library, HSCL, Room C2-3.
Thursday, November 1	2:00 PM - 4:00 PM 2:00 PM - 4:00 PM at Health Science Center Library, HSCL, Room C2-3.

If needed you may ask for directions at the info desks on the 1st floor or 2nd floors of the HSCL library.

Library Guide for the course is:
<http://guides.uflib.ufl.edu/chm4411>

Prelab Exercises, Collecting and Analyzing the Data Before Leaving the Lab: 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. If the TA or instructor observes that you are unprepared for the lab (ie you do not appear to know what you are doing, you cannot answer questions asked of you) 5 points will be deducted. 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.

Late Arrival and Unpreparedness: 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 6 prelabs, write 3 abbreviated and 1 full reports, complete library and error analysis assignments, and submit data analysis for pKa. In addition, each student will contribute to the group work of a full report and an oral report, which will be presented by the group 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 12:50 PM on Friday, 12/07/2012.

Week	Lecture (M)	Experiment (WR)	Report Type	Report Author	Report Due
8/20	-				
8/27	NMR Data Analysis	Cis/Trans Equilibrium of N-acetylcholine	Abbr. (TA)	All	9/10 ^a
9/3	Labor Day/ No Lecture	Intro Error Analysis/ Excel NMR lab Analysis*	HW (TA)	All	9/10 ^b
9/10	Intro Error Analysis/ Particle in a Box	Library Methods and Assignment (MSL 308)	Literature search (DW)	All	1 week ^b
9/17 ‡	Particle in a Box	Rotation #1	Abbr (TA).	All	1 week ^a
9/24 ‡	Spectroscopy	Rotation #1	Abbr (TA).	All	1 week ^a
10/1 ‡	Thermodynamics/ DSC	Rotation #1	Abbr (TA).	All	1 week ^a
10/8	pKa	pKa (data collection)	Data analysis (TA)	All	1 week ^a
10/15	pKa Quiz	pKa (data analysis)	Abbr (TA).	All	Week of 10/22 ^a
10/22 †	Kinetics	Rotation #2	Full (MU)	All	Week of 11/5 ^a
10/29	Kinetics	Health Science Library	Library Assignment (MT)	All	1 Week ^b
11/5 †	Adsorption	Rotation #2	Full (MU)	All	Week of 11/19 ^a
11/12 †	Veterans Day/ No Lecture	Rotation #2	Full (MU)	All	Week of 11/26 ^a
11/19	Binding Theory	No lab - Thanksgiving			
11/26	Instrumental Quiz	Oral Reports	Oral (TA-MU)	All	11/28, 11/29
12/3	TBA	No lab - Reading			

a: to be collected in your lab section

b: to be collected on lecture

*: IF you do the ERROR ANALYSIS homework BEFORE doing the Abbr Report for Cis/trans Equilibrium, you will find it helpful!!!

Rotation #1* = Phase Diagram, Membrane Permeability, Conjugated Dye
 Rotation #2† = Carbonic Anhydrase, Adsorption from Solution

Rotation #1 Schedule:

Experiment Name	Membrane Permeability	Conjugated Dye	Phase Diagram
Report Type	Abbr.	Abbr.	Abbr.
Week 5 9/17	Group A	Group C	Group B
Week 6 9/24	Group B	Group A	Group C
Week 7 10/01	Group C	Group B	Group A

Note: During this rotation, you will be in lab each week. You are to come prepared with the prelab for your assigned experiment: due at the beginning of the lab period.

Rotation #2 Schedule:

Experiment Name	Carbonic Anhydrase	Adsorption
Report Type	Full	Full
Week 11 10/22	Group A	Group B
Week 12 11/05	Group C	Group A
Week 13 11/12	Group B	Group C

Note: Not everyone may have a lab period each week! PAY ATTENTION to your group. Your prelab for the experiment you do that week is due at the beginning of the lab period.

Reports and Graders:

Report (Type)	Grader
Carbonic Anhydrase (Full) Adsorption from Solution (Full)	Dr. Ucak
Phase Diagram (Abbreviated) Conjugated Dye (Abbreviated)	Imran
Cis/Trans of N-Acetylcholine (Abbreviated) Membrane Permability (Abbreviated)	Adam
pKa Data Analysis	Adam/ Imran/ Bhase
Oral Reports	Adam/ Imran/ Bhase
Error Homework	Bhase
Library Assignment	Dr. Tennant
Presentation Questionnaire	Ms. Wrublewski

For first experiments: Cis/Trans Equilibrium:

Arrive in the lab rom, LEI 248.

Wednesday section: August 29th from 12:50-6:00 PM.

Thursday section: August 30th from 12:50-6:00 PM.

Students in each section will be broken into two groups, to be assigned in the first lecture.
First group shows up at 12:50. Next group shows up at 2:30 PM.