



CHM4411L: Physical Chemistry Laboratory

Summer 2019 (May 13 – August 9)
(2 Credit Hours)

[Course Website](#)

Course Materials and “Manual:” All course materials will be available through our secure course website, listed above, which is a Canvas LMS site hosted by Instructure. There is no printed textbook or lab manual.

Office Hours: Room - LEI 232

Day	Hours
Monday	12:00 pm – 1:00 pm
Tuesday	11:00 am – 12:00 pm
Wednesday	11:00 am – 12:00 pm

Office hours can also be held by appointment if you have a conflict with the ones listed.

Contact:

Email should be sent through the Canvas messaging tool, and should include your section number and group designation. Occasionally, we will use the announcement tool on Canvas to disseminate information to the entire class. Please ensure that your Canvas account is configured to send notifications to your preferred communication/ email method.

Weekly Lecture Period: FLI 113

Thurs: 5th period (11:45 – 12:35)

Attendance is mandatory.

Lab Sessions: LEI 248 - Period 6-10 (12:50 pm – 6:00 pm)

Class #	Section	Day
11558	25G5	Tuesday
11559	25GF	Wednesday

- It is your responsibility to come prepared each week. The specific requirements will be unique for each experiment, which means you will need to attend the weekly lecture and read the material provided online in order to know what is expected of you.
- There will be pre-lab quizzes for some of the experiments throughout the semester.

FALL SEMESTER 2019

	S	M	T	W	T	F	S
Aug.	11	12	13	14	15	16	17
		Registration			Drop/Add		
	18	19	20	21	22	23	24
		Drop/Add					
	25	26	27	28	29	30	31
Sept.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30					
Oct.			1	2	3	4	5
	6	7	8	9	10	11	12
	13	14	15	16	17	18	19
	20	21	22	23	24	25	26
	27	28	29	30	31		
Nov.						1	2
	3	4	5	6	7	8	9
	10	11	12	13	14	15	16
	17	18	19	20	21	22	23
	24	25	26	27	28	29	30
					----Holiday----		
Dec.	1	2	3	4	5	6	7
	8	9	10	11	12	13	14
						Commencement	
	15	16	17	18	19	20	21
	22	23	24	25	26	27	28
	29	30	31				

- Your TAs will check your material and knowledge of the experiment at the beginning of each lab session to ensure you are adequately prepared (including proper clothing). If they are not satisfied, they may turn you away.
- Contact your instructors and group members well in advance of any anticipated absence so alternative scheduling can be made. For some weeks your lab group may be assigned a specific time of arrival.

Course Objectives

- Create publication-quality scientific reports.
- Analyze and present experimental data cogently, and succinctly.
- Keep a professional scientific notebook.
- Perform reliable and accurate measurements.
- Interpret and expand scientific protocols and experimental design.
- Give a professional presentation on scientific work performed in the lab.

Lab Safety

All safety procedures must be strictly obeyed. Eye protection (safety glasses or goggles) must be worn at all times in the laboratory. Wear long-sleeved and -legged clothes to protect your skin against spills, or bring a lab “kittel.” Closed-toed shoes are mandatory. Remove all pendant jewelry when working in the lab. If you have long hair, you may not let it hang loose but should tuck it away safely so that it doesn’t present a potential hazard for you. Refer to the [ACS safety manual](#) (click on the link or find under Files → Resources on Canvas) which regulates all safety procedures in the lab.

Ethics

Students are expected to conduct themselves professionally in this course. This includes following the UF Honor Code (see below) and a complete understanding of academic integrity. Plagiarism and data fabrication will not be tolerated.

Groups

Each lab section will be divided into groups. You will work together as a team in the lab. For some labs several groups will work together. Lab reports will be submitted individually. When working on reports, it is ok to collaborate with other students, but each student should create and submit their own work. For example, it is not ok for one student to create a figure which is then used by other students in the class, but it is ok for students to work together to ensure that each figure is professional quality.

Lab Notebook and Data Plotting.

Every good Chemist has a lab notebook by their side. It is a journal, evidence of discovery, a historical record, and a valuable tool. You will keep a proper lab notebook in this course. Your notebook will be checked and graded at the beginning and end of each lab period.

- Prior to the experiment:
 - Every **individual's** notebook needs to be prepared with all tables and notes necessary for the specific experiment prior to coming to lab. This will be uploaded to Canvas prior to the lab session and will determine your Notebook Grade (see grade computation below).
 - Every **group** should come with a laptop that has sufficient software to plot data as you collect it. The specific software should be prepared before coming to lab.
- During the lab session:
 - Your group should assess your data as it is collected, either visually with a plot, or by forming a table, or both.
 - It is your responsibility to repeat data measurements in cases where things have gone awry.

Written Lab Reports

Each student will be responsible for submitting a write-up after each experiment. The specific expectations and due dates will be stated on the assignment page for each experiment. Many of the assignments will require you to write one or more of the sections described below:

1. Title Page and Abstract

2. Introduction: State purpose and/or problem on which the experiment is focused. Briefly indicate the theory or hypothesis to be verified.
3. Experimental: Briefly describe the procedure used.
 1. It may be appropriate to include an illustration or a block diagram of the experimental set-up.
 2. Include a structure diagram of any chemicals used in the experiment (excluding solvents etc.), and the schemes of any reactions that take place.
 3. Any equations used in the derivation of values of interest using measured values, including example calculations
4. Results:
 1. Summary of results presented in tables and/ or figures
 2. Any equations used in the analysis of the collected data, including example calculations
 3. Error analysis
5. Discussion: Based on your experimental results evaluate your data in terms of the applicable theory, and try to answer the question/ hypothesis presented in the introduction.
 1. Determine whether your results corroborate or disprove the working theory/hypothesis.
 2. Suggest reasons for such disagreements and try to analyze them as much as possible. If your results fit within the accepted theory, discuss to what extent (to which experimental precision) this is the case.
 3. Discuss strengths and weaknesses of the approach. Discuss what improvements could be done to the experimental approach and/or the theory.
6. Conclusion: Briefly restate the most important conclusions worked out in the Discussion section, give important measurement results with proper error limits, and state how your work fits into the bigger scheme of things (as outlined in the introduction).
7. References – References should follow ACS formatting guidelines
8. Whenever possible and appropriate use mathematical, spreadsheet and/or graphing software for your analysis, such as Mathematica, Matlab, Matplotlib, MS Excel, xmgrace, Texplot, Sigmaplot, *etc.* Make sure that your plots look professional. The default setting of MS Excel is particularly notorious in producing awful plots. If you decide to work with Excel, make sure to modify the settings to produce high quality plots.
9. Reports should be prepared by computer. Either use a word processing program or one of the more advanced mathematics programs that allow you to intersperse text with calculations and figures. Pay attention to typos (use your word processing program's spell-checker), and to proper grammar.

Course Grade Computation

Your letter grade will be derived from a simple calculation: the weighted average of your performance in:

	Percentage Points
Quizzes	10%
Notebook	20%
Reports (written and oral)	70%
Total	100%

Your course grade will be determined from your total course performance percentage as follows:

A	100%	94.0%
A-	93.9%	90.0%
B+	89.9%	87.0%
B	86.9%	84.0%
B-	83.9%	80.0%
C+	79.9%	77.0%
C	76.9%	74.0%
C-	73.9%	70.0%
D+	69.9%	67.0%
D	66.9%	64.0%
D-	63.9%	60.0%
E	59.9%	0.0%

All grades will be posted in the Canvas GradeBook, as available.

UF's Grading Policy: <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Week	Date	Experiment
1	Aug 18-24	No Lab
2	Aug 25-31	Heat Capacity Ratios
3	Sep 1-7	Library/ Graphing Lecture
4	Sep 8-14	Conjugated Dyes
5	Sep 15-21	Kinetics
6	Sep 22-28	Data Analysis
7	Sep 29 - Oct 5	NMR
8	Oct 6-12	Phase Diagram/ Membrane Permeability Rotation
9	Oct 13-19	Phase Diagram/ Membrane Permeability Rotation
10	Oct 20-26	Rotation 1
11	Oct 27–Nov 2	Rotation 2
12	Nov 3-9	Rotation 3
13	Nov 10-16	Rotation 4
14	Nov 17-23	No Lab
15	Nov 24-30	Thanksgiving
16	Dec 1-7	Reading Days
17	Dec 8-14	Finals

Rotation 1.

Group 1: I₂
Group 2: FTIR
Group 3: pK_a
Group 4: EPR

Rotation 2.

Group 1: EPR
Group 2: I₂
Group 3: FTIR
Group 4: pK_a

Rotation 3.

Group 1: pK_a
Group 2: EPR
Group 3: I₂
Group 4: FTIR

Rotation 4.

Group 1: FTIR
Group 2: pK_a
Group 3: EPR
Group 4: I₂

Absences and Tardiness

Excused absences are allowed in accordance with UF policy. Consult with your instructor and group members in advance. Do not arrive late to your lab. Unexcused arrival more than 30 minutes late for a lab may result in the student not being admitted to the lab. This leads to an automatic loss of all notebook points and the student may not use this lab for an oral lab report.

Late Submission Policy

Late assignments will receive a late penalty of 10% per day past the scheduled due date. If something arises that prevents you from completing the assignment on time, contact the instructor as soon as possible to request an extension.

Resubmission Policy

If you are unhappy with the grade of a written report, you may resubmit it with corrections. Each assignment can be resubmitted once. The resubmission must be turned in no more than one week after the original grade is posted to Canvas. The maximum score you will be able to receive is 80% (B-). Resubmissions are only an option if there is sufficient time left in the semester.

Getting Help

For quickest response, you might find posting questions to the Canvas Discussion Board might be a good choice. Messaging the Instructor, TA, or even a classmate also works.

For Username/Password issues, such as difficulties logging into any Gatorlink-authenticated site at UF, (including our course website), please contact the UF Help Desk at: helpdesk@ufl.edu, (352) 392-HELP - select option 2.

University Policy on Accommodating Students with Disabilities

Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

University Policy on Academic Misconduct

This class will operate under the policies of the student honor code which can be found at:

<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-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. For more information regarding the Student Honor Code, please see: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>.

Disclaimer for this document

Note: All aspects of course operations, including grading, course policy and policy execution, are subject to change at the discretion of the course instructor.

If you have further questions, please contact us. Have a great semester!

Sincerely,

Adam Mansell