



CHM4413L: Biophysical Chemistry Laboratory

Fall 2020 (January 11 – April 30th)
 (2 Credit Hours)
 Holidays: Jan 18th

[Course Website: UF e-Learning \(CANVAS\)](#)

Communication Polices:

Office Hours: Individual office hours will be held for the instructors and teaching assistants (TAs) as outlined in Canvas (see Canvas site for full detailed information). Office hours can also be requested by appointment if you have a conflict with those listed. During COVID-19 restriction time, office hours will be held via the CANVAS Zoom Platform as the general policy. Some information in this course is best discussed at a blackboard or in person and Dr. Fanucci is willing to meet one-on-one if requested.

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.

Instructor: Gail E. Fanucci (she/her)

Office Hours (GEF): Tues 2:00-3:30 PM; office CLB 311F, Zoom and by request. Zoom times will be set in Canvas as recurring.

Contact:

Email: 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. You can email Dr. Fanucci in an emergency situation at Fanucci@chem.ufl.edu. Cell phone contact via text is also allowed for an emergency situation: 352-219-5201. During the week, I will respond as quickly as I can between 8AM and 6PM. Over the weekend, it is unlikely you will get a response from me until Monday morning.

Weekly Lecture Period:

Wednesday 5th period (11:45 – 12:35 am) Leigh Hall, Rm TBA or via Zoom
 Attendance is required.

For some lectures, lecture material will be recorded and made available for viewing in advance of the weekly lecture period. While the lectures can be viewed at any time, it is expected that all students watch the lectures before the lab period to prepare for the lab.

Our class sessions may be audio or visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent

		SPRING SEMESTER 2021						
		S	M	T	W	T	F	S
Jan.							Holiday 1	2
	3	4	5	6	7	8	Registration	9
	10	11	12	13	14	15	16	
	17	Holiday 18	19	20	21	22	23	
	24	25	26	27	28	29	30	
31								
Feb.		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							
Mar.		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				
Apr.					1	2	3	
	4	5	6	7	8	9	10	
	11	12	13	14	15	16	17	
	18	19	20	21	22	23	24	
					Reading Days			
	25	26	27	28	29	30		Commencement

to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Lab Sessions:

Section	Day	Period	Time	Location
11079	Thursday	6 th - 10 th	12:50 – 6:00 pm	LEI 248/LEI 300
11106	Thursday	6 th - 10 th	12:50 – 6:00 pm	LEI 300
30885	Thursday	6 th - 10 th	12:50 – 6:00 pm	LEI 248/LEI 300
30887	Thursday	6 th - 10 th	12:50 – 6:00 pm	LEI 300
31802	Wednesday	6 th - 10 th	12:50 – 6:00 pm	TBD
31803	Wednesday	6 th - 10 th	12:50 – 6:00 pm	TBD

Course Materials and Manuals: All course materials will be available through our course Canvas site linked above. There are no printed textbooks or lab manuals

Learning Objectives

The overall learning objective of this course is to develop critical thinking through laboratory experiments, analysis of experimental data, and communication of that knowledge. More specifically, objectives include:

- Create quality scientific reports that accurately and professionally communicate your results
- Analyze and present experimental data graphically, cogently, and succinctly
- Maintain a professional scientific notebook
- Interpret and expand scientific protocols and experimental design
- Use and optimize instrumentation for data collection
- Describe various physical chemistry concepts
- Evaluate models for explaining experimental results

COVID-19 Related Policies

Course Organization

This course is organized in a hybrid format utilizing both online and in-person activities. All lectures, office hours, and discussions related to addressing questions about assignments will be held remotely via Zoom, or by special request to meet in person. Laboratory experiments will include both in-lab hands-on activities and complementary “dry lab” activities (e.g. computational simulations that relate to the in-lab experiments). We will alternate groups of students weekly between “wet lab” and “dry lab” experiments so that we can accommodate University social distancing policies for all in-person learning activities.

In-Lab Expectations

In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-lab interactions.

1. In addition to the generally required personal protective equipment for in-lab activities (see below, you are also required to always wear approved face coverings during in-person labs and within buildings. Following and enforcing these policies and requirements are all our responsibility. Failure to do so will lead to severe consequences, including removal from the lab and filing a report to the Office of Student Conduct and Conflict Resolution.
2. This course has been assigned physical laboratory spaces with enough capacity to maintain physical distancing requirements, which are a minimum of 6 feet apart. Utilize designated

benches and maintain appropriate spacing between students and TAs. Please do not switch spaces.

3. Sanitizing supplies are available in the lab. At the beginning and end of each lab you must wipe down your lab bench and any equipment used during the experiment.

4. Guidance will be provided to you on how to enter and exit the laboratory. Practice physical distancing to the extent possible when entering and exiting the laboratory.

Illness & Make-up Policies

1. If you are experiencing COVID-19 symptoms, have tested positive for COVID-19, or are otherwise sick, do not attend in-lab experiments and inform your instructor and TA via an email in Canvas that you will not be able to attend the planned in-lab activity. If you arrive to lab with visible signs of an active illness you will be asked to leave.

2. If you are forced to miss a lab, please contact the instructor as soon as possible to begin the process of scheduling a make-up.

3. If you are forced to miss multiple lab sessions, you should contact the UF Disability Resource Center (DRC)

General Expectations:

- 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 to know what is expected of you.
- All wet lab experiments require pre-lab notebook activities that will be graded as on-line submissions.
- Attendance during lecture is mandatory. There is an attendance and tardiness grade. You are allowed 2 unexcused absences. Every unexcused absence will lower your attendance grade by 25%. Tardiness to class beyond 2 times will also lower your attendance grade by 25%.
- Most experiments also require some pre-lab notebook activities that will be graded as on-line submissions. You are required to submit a digital image of your prepared notebook before entering the lab period.
- Proper attire is required for each lab period. Closed toed shoes, safety goggles, no tank tops and no shorts and adherence to physical distancing policies and all UF COVID-19 policies.
- 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.
- If you arrive tardy to the lab (> 5 minutes after the beginning of the lab period), your notebook grade will be reduced by 10% for that day. If this occurs more than 3x throughout the semester, your overall notebook grade will be entered as a zero for the semester. Arriving on time is essential as important safety information will be described at the beginning of each lab period.

Lab Safety

In addition to wearing an approved mask (see COVID-19 policies above) safety glasses 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 does not present a potential hazard for you. Refer to the [ACS safety manual](#), which regulates all safety procedures in the lab. Being prepared is an important aspect of safety.

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 of two-three students. You will work together as a team in the lab. For some labs several groups will work together. Report assignments can be in groups or individual. Please pay attention to those details on the Canvas submission site. You will evaluate each other's contributions to group lab reports.

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 a title, purpose, reagent safety, tables and notes necessary for the specific experiment prior to coming to lab for every lab experiment. Do not copy the procedure from the manual. There is a pre-notebook grade each week of acceptable (100%), unacceptable (50%), or empty (0%).
 - 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.
- Pre-lab Notebook activities: - Some experiments have a prelab notebook activity (that is above and beyond the normal prepared notebook). In those cases, there is additional information that will be graded at the beginning of the lab experiment (upload into Canvas).
- 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.
 - You should write into your notebook the activities and measurements you do (again, do not copy from the manual, but write what you actually do).
 - Always check that you can open your saved data files before leaving the laboratory!
- End of Lab Notebook grade: - Your TA will check your notebook **after the experiment**, and grade it as acceptable (100%), unacceptable (50%) or empty (0%).
- Please bring your notebook during lab and lecture periods and any meetings with the professor and TAs. There will be lecture sessions where we go over data analysis and error analysis and these sessions will be working activities and as such your notebooks are required and it will also be a good idea to bring your laptop or other computing device to those scheduled lectures. Also, the in-class quizzes are open notebook!

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. Some assignments will be as individuals and some as groups. 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 of 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. Figures and Tables properly formatted that summarize the results.
 2. A written summary of results presented in tables and/ or figures.

3. Any equations used in the analysis of the collected data, including example calculations.
4. 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 non-scientifically formatted 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.

Policy for Requesting Office hours

If you are unable to make the scheduled office hour, please send an email through Canvas and propose three times you are available to meet. I will respond with a time that works for both of us.

Absences and Tardiness

Excused absences are allowed in accordance with UF policy. If you are feeling ill or have received a positive test result for COVID-19, do not show up to in-person laboratory experiments and consult with your instructor on an appropriate course of actions. See "COVID-19 Policies" above.

Otherwise, do not arrive late to your lab. Tardiness will lead to loss of points on the notebook grade. Unexcused arrival more than 30 minutes late for a lab will result in the student not being admitted to the lab.

Late Submission Policy

Assignments received past posted due dates will receive a late penalty of 10% per day unless the late submission is approved through prior communication with course instructors. If something arises that prevents you from completing the assignment on time, contact the course instructors right away to request an extension.

Resubmission Policy

If you are unhappy with the grade of a written report, you may resubmit it with corrections. Only one assignments per semester can be resubmitted; and need to be done within 2 weeks of receiving the graded assignment is posted in Canvas. The maximum score you will be able to receive is 80%. Note, this means a resubmission can only be possible for assignments where you scored less than 80%!

Regrade policy

If you believe a mistake has been made on the grading, please notify the professor and your TA through Canvas within 1 week of receiving the assignment. We will look at it and regrade on a case-by-case basis. If, however, a lower score results from my grading of an assignment that a TA graded, then the lower grade will stand. I do not expect these types of errors to occur, but if they do please let us know.

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.

Course Grade Computation

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

	Percentage Points
On-line Quizzes (prelab and post lab feedback)	10%
Attendance, Participation and Preparedness	5%
Pre-lab and Post-lab Notebook	15%
Written Report Activities	60%
Literature Project	10%
Total	100%

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

>94%	A
90%	A-
86%	B+
83%	B
80%	B-
75%	C+
70%	C
65%	D+
50%	D
< 50%	E

All grades will be posted in the Canvas GradeBook, as available. Final grades will include rounding. Please note, in my experience, Canvas does NOT round. Example: If you earn an 89.5 or greater, I will round your final grade when submitting grades. I do not curve for the class. The grading scale may change as the semester progresses, but changes will only move percentage values down and not up. Don't bet on this happening, but I have done it in the past to adjust for different stringencies in report grading.

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

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/scr/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/>.

Schedule for the Semester

Week	Date	Lecture	Groups 1	Groups 2
1	Jan. 10- Jan.16	Course Introduction	Heat Capacity Ratios	REPORT ANALYSIS [¥]
2	Jan. 17 – Jan. 23	Literature and Reference Management Software	REPORT ANALYSIS [¥]	Heat Capacity Ratios
3	Jan. 24- Jan 30.	Tables and Figures	DRY LAB [¥]	DRY LAB [¥]
4	Jan 31 – Feb. 6	Statistical Treatment of Data	DATA ANALYSIS & FIGURES [¥]	DATA ANALYSIS & FIGURES [¥]
5	Feb. 7 – Feb. 13	Quantum Chemistry and Conjugation	Conjugated Dyes	DRY LAB
6	Feb. 14 – Feb. 20		DRY LAB	Conjugated Dyes
7	Feb. 21 – Feb. 27	Acid-Base Equilibria and Henderson Hassel Bach Equation Calculations	pKa of neutral red PREP [¥]	pKa of neutral red PREP [¥]
8	Feb. 28 – Mar. 6	Surfactants	DRY LAB [¥]	pKa of neutral red1
9	Mar 7. – Mar 13.		pKa of neutral red1	DRY LAB [¥]
10	Mar. 14. – Mar. 20		DRY LAB [¥]	pKa of neutral red2
11	Mar. 21 – Mar. 27		pKa of neutral red2	DRY LAB [¥]
12	Mar. 28-Apr.3		Enzyme Kinetics 1	DRY LAB [¥]
13	Apr 4 th – Apr.10	Analyzing Scientific Literature	DRY LAB [¥]	Enzyme Kinetics 1
14	Apr. 11-Apr. 17 th	Analyzing Scientific Literature		
15	Apr 18- Apr 24	Reading Days	None	None
16	Apr. 25- May 1	Finals Week	None	None

[¥] will be attended via Zoom Conference within Canvas

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 me. Have a great semester!

Sincerely,

Gail E. Fanucci