

CHM 3400
Physical Chemistry for the Biosciences
Fall 2022

Canvas e-learning site:

All communications must be done through the e-learning site, including homework, deadlines, grades and announcements. It is your responsibility to check this site for updates. Please do not email the instructor (or the TA) personal email accounts.

Schedule: M, W, F | Period 2 (8:30 AM - 9:20 AM)

[LEI 0207](#)

Professor: Dr. Coray M. Colina

Office: Leigh Hall, Room 354

Office Hours: Leigh Hall 328

Monday 9:30 m to 10:30 am, Wend noon to 1 pm.

Graduate Teaching Assistant Zak Pasternak

Office Hours: Leigh Hall 328

Thursday: noon to 2 pm.

Prerequisites: CHM 3120, MAC 2312 and two semesters of college physics.

Textbook:

We recommend

“Physical chemistry for the biosciences,” Raymond Chang

It is not required, but you **MUST** have an undergraduate Physical Chemistry Book that includes thermodynamics and kinetics. If you do not have Chang’s, show the instructor any of the ones you have, and she will tell you if it is ok.

COVID-19

In response to COVID-19, the following recommendations are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.

- If you are not vaccinated, get vaccinated. Vaccines are readily available and have been demonstrated to be safe and effective against the COVID-19 virus. Visit one.uf for screening / testing and vaccination opportunities.
- If you are sick, stay home. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 to be evaluated.
- With an excused absence you will be given a reasonable amount of time to make up work.

Face to face learning

Attendance: Lecture attendance is essential for your success in this class. However, we will not take roll. Repeated absence in class will make it very difficult to earn full participation points.

We will combine a traditional lecture with application problems. In addition to the 3 hours class a week, ~8-10/week of reading, homework and general study are required. Lectures will not be recorded.

Homework: There will be homework assigned nearly every week. Homework is due one week after it is assigned. It has to be turned in before or at the beginning of the lecture class. They will be graded and returned. There will be no partial credit for late homework. If not turned in before or at the deadline, the grade will be zero. Solutions will be provided after the deadline, and no more homework will be accepted for grading, although you are still responsible to finish it to be ready for the exams. Each homework problem has to show the full derivation, using SI units, unless otherwise stated. Units and numerical results will be checked and graded. No points will be given for a final result without justification.

Answers should be turned in on time and should be neat and legible. Write your name and UFID clearly on each page. Each homework problem has to show the full derivation. Several of the homework assignments involve interpretation of computational and 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. No points will be given for a final result without justification

While you might work in groups the homework assignments must be turned in individually, thus you must turn in your own work to receive any credit! Any sort of plagiarism will not be tolerated. 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.

Exams: There will be three progress exams. Conflicts with these exams' dates should be resolved with the instructor no later than one week prior to the exam date. There will be no make-up exams. The exam dates will be announced shortly.

There is NO FINAL in this class.

Grading: The grade will be determined by Homeworks (30%), 3 progress tests (60% total) and 10% at professors' discretion (attendance, participation, etc.) There is not final exam. The grades are absolute, there will be no curve grading.

Grading scale:

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

Course Evaluations: Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

HONOR CODE The student honor code can be found at <http://www.registrar.ufl.edu/catalog/policies/students.html>

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.

On all work submitted for credit by students at the university, the following pledge is either required or implied: On my honor, I have neither given nor received unauthorized aid in doing this assignment.

Cheating on an exam will result in a grade of zero. Although homework is expected to be worked “in group”, the submitted homework solution must be your individual work. If any homework or quiz assignment is suspect, a grade of zero will also be given for that assignment.

Information on current UF grading policies for assigning grade points is available at <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students with disabilities: Students requiring special accommodations need to register at the Dean of Student Offices and bring the documentation to the instructor.

Counseling services are available at <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.

Campus Resources:

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.

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.

Course Syllabus
(Tentative)
CHM 3400 – Physical Chemistry

Note: Items marked with an asterisk (*) will depend on the time available.

Why Physical Chemistry ?

The First Law: Energy Is Conserved.

Energy Conversion and Conservation.

Describing the State of a System.

Phase Changes. Chemical Reactions.

The Second Law: The Entropy of the Universe Increases.

A New State Function, Entropy.

The Second Law of Thermodynamics: Entropy Is Not Conserved.

Chemical Reactions. Third Law of Thermodynamics.

Gibbs Free Energy. Helmholtz Free Energy. Noncovalent Reactions.

Free Energy and Chemical Equilibria.

Chemical Potential (Partial Molar Gibbs Free Energy).

Reactions of Gases: The Ideal Gas Approximation.

Nonideal Systems.*

The Eq. Constant and the Standard Gibbs Free Energies of the Reactants and Products.

Biochemical Applications of Thermodynamics

Kinetics: Rates of Chemical Reactions.

Kinetics. Reaction Mechanisms and Rate Laws. Temperature Dependence.

Transition-State Theory. Electron Transfer Reactions: Marcus Theory. *

Ionic Reactions and Salt Effects. Isotopes and Stereochemical Properties.

Very Fast Reactions. Diffusion-Controlled Reactions.

Photochemistry and Photobiology. Photosynthesis.*

Enzyme Kinetics. Michaelis-Menten Kinetics. Competition and Inhibition.