

CHM3400 — Physical Chemistry for the Biosciences – Summer 2016

Instructor	Dr. Alexander Angerhofer
Phone	352-392-9489 (office, CLB318A)
E-mail	alex@chem.ufl.edu
Class Times	M-F 2 nd period (9:30-10:45am) in Leigh Hall 207
Office Hours	Periods M-6, W-7, F-1 in CLB318A, and by appointment

TA	Anthony Pastore	Vinicius Cruzeiro
Phone	352-392-0493	352-846-1633
E-mail	atpastore09@ufl.edu	vwcruzeiro@ufl.edu
Office Hours	T-6, W-6, R-6, CLB318	M-5, W-5, R-5, Lei 442

Holidays	07/04 (Independence Day).
Course Text	“Physical Chemistry for the Biosciences,” by Raymond Chang, University Science Books, Sausalito, CA, 2005, ISBN #1-891389-33-5.
Homework	Homework will be assigned twice each week, usually on T and F and be due at 9:30am (beginning of class) the next F or T, whichever comes first.
Points Earnable	2 progress exams @ 200 pts. each for 400 pts. total. 1 cumulative final exam @ 400 pts. For 400 pts total. 2 online quizzes @ 50 pts. each for 100 pts. total. 10 homeworks @ 20 pts. each for 200 pts. total. 1 participation grade @ 100 pts. for 100 pts. total. Total earnable points are 1,200 pts.
Grading Scheme	A: $\geq 84\%$ (1010 pts) 84.2% (1010 pts) > A- $\geq 80.8\%$ (970 pts) 80.8% (970 pts) > B+ $\geq 77.5\%$ (930 pts) 77.5% (930 pts) > B $\geq 71.7\%$ (860 pts) 71.7% (860 pts) > B- $\geq 68.3\%$ (820 pts) 68.3% (820 pts) > C+ $\geq 65.0\%$ (780 pts) 65.0% (780 pts) > C $\geq 58.3\%$ (700 pts) 58.3% (700 pts) > C- $\geq 54.2\%$ (650 pts) 54.2% (650 pts) > D+ $\geq 50.0\%$ (600 pts) 50.0% (600 pts) > D $\geq 43.3\%$ (520 pts) 43.3% (520 pts) > E.

Course Schedule (tentative):

Date	Day	Chapter	Topic	Reading
06/27/16	M	2	Gas Laws	pp. 7-21
06/28/16	T	2	Kinetic Theory of Gases	pp. 21-31
06/29/16	W	3	The First Law of Thermodynamics	pp. 39-49
06/30/16	R	3	Heat Capacities, Gas Expansion, and Calorimetry	pp. 49-74
07/01/16	F*	4	Entropy	pp. 81-86
07/05/16	T	4	Carnot Engine, 2 nd Law of Thermodynamics	pp. 87-95
07/06/16	W*	4	3 rd Law of Thermodynamics, Gibbs Energy	pp. 95-110
07/07/16	R		Field Trip I, Micro-Kelvin Lab	
07/08/16	F*	5	Ideal Solutions, chemical potential	pp. 127-131
07/11/16	M	5	Thermodynamics of Mixing, Real Solutions	pp. 132-142
07/12/16	T*	5	Colligative Properties	pp. 142-154
07/13/16	W	6	Chemical Equilibrium	pp. 193-203
07/14/16	R	2-5	Mid-Term Exam I (during class)	
07/15/16	F*	6	Heterogeneous Equilibria, Ligand Binding	pp. 203-217
07/18/16	M	6	Bioenergetics	pp. 217-229
07/19/16	T*	9	Chemical Kinetics, Rxn Rates, Molecularity	pp. 311-332
07/20/16	W	9	Temperature Effects and Potential Energy Surfaces	pp. 332-336
07/21/16	R	9	Rxn Rate Theories, Rxns in Solution	pp. 336-354
07/22/16	F*	10	Enzyme Catalysis	pp. 363-372
07/25/16	M	10	Enzyme Inhibition, Allosterism, pH Effects	pp. 372-396
07/26/16	T*	11	Quantum Mechanics – The Foundations	pp. 401-410
07/27/16	W	11	De Broglie, Heisenberg, Schrödinger Equation	pp. 410-426
07/28/16	R	6, 9, 10	Mid-term Exam II (during class)	
07/29/16	F*	11	Atomic Orbitals and the Periodic Table	pp. 426-439
08/01/16	M	12	The Chemical Bond, MO Theory	pp. 447-468
08/02/16	T*	12	Coordination Compounds	pp. 469-483
08/04/16	W	14	Spectroscopy, μ W, IR, and UVVIS	pp. 513-539
08/03/16	R		Field Trip II, NMR Lab	
08/05/16	F	2-6,9-12,14	Final Exam (during class time)	cumulative

* Days homework will be due.

Further Important Information:

1. **Overview and Goals:** CHM 3400 is a one-semester overview of physical chemistry with emphasis on biological systems. It covers the whole range of physical chemistry, *i.e.*, thermodynamics, electrochemistry, chemical kinetics, molecular structure and bonding, and spectroscopy. The goal of this course is to familiarize students who major in biochemistry or other bio-related majors with the techniques and tools of physical chemistry.
2. **Prerequisites:** MAC 2312, CHM 2200 or CHM 2210, and two semesters of college physics.
3. **Exam Policies:** Two mid-term exams will be given (see schedule above). Making up a missed exam is a serious and exceptionally burdensome problem. Consequently, a makeup exam will require that you have a legitimate excuse, and that you have brought this to the attention of the instructor before the missed exam. Legitimate excuses include sickness or a conflict with another exam for a higher numbered class. If you are not sure whether your excuse is valid, talk to the instructor before missing an exam. If you have an emergency that prevents you from letting the instructor know ahead of time, an excused absence and rescheduled make-up exam will be granted after official documentation about your emergency (doctor's notes, *etc.*) deemed appropriate by your instructor has been presented. Since the final exam is cumulative, the instructor reserves the right to consider assigning a letter grade above that which the student would receive based strictly on total points earned (as listed above). Of course this will only take effect if the performance on the final exam is significantly above the student's performance for the semester, and if the student shows clear improvement in his/her grades over the course of the semester. This qualification cannot lower your grade and will depend on the instructor's evaluation of the student's performance on the final exam. A student contending that an exam or quiz has been mis-graded or mis-scored must report this to the instructor or TA responsible for grading within one week of receiving the original grade or score. Failure to follow this policy results in no reconsideration of the contended grade or score. For all questions on grades or grading, please consult with the instructor (or TA) in person. Except for problems with on-line quizzes (see below), emailed questions on grades or grading will not be answered.
4. **On-line Quizzes:** There will be two on-line quizzes on elearning (1 quiz = 50 points max.). The on-line quizzes will be administered through the elearning interface (canvas) to the class. Quiz durations will be 60 minutes. For your convenience the web format will allow for an extended period of time (typically a 4-day period) during which you can take the quiz. Once a quiz has been started the clock starts running and you have to finish it in the allotted time.
5. **E-learning:** This course uses the canvas e-learning site. Please log on at <http://elearning.ufl.edu/> to get access to your course page.
6. **Study Habits:** This course demands on average 12 – 15 hours/week of work outside of class. Regular lecture attendance is essential. The class will not be taught “by the book.” It is expected that you read the assigned pages from the textbook in advance to coming to class. The instructor will build on this material and you are expected to be able to follow in-class discussion. The course demands a regular sustained effort throughout the term. Most importantly, do not allow yourself to fall behind! The material builds up and you need to stay ahead of the game. If you find that you are not grasping essential material by reading the textbook and following in-class discussion, seek help! Visit your instructor's and/or TAs' office hours (see above), talk to other students in your class, compare notes, form a study group, *etc.*
7. **Homework:** Homework will be assigned twice every week. The homework will come from problems in the book as well as other problem sets that the instructor may assign and computer-assisted projects. Homework will typically be assigned on Tuesdays and Fridays and will be due the next Friday or Tuesday, whichever comes first at the beginning of lecture (9:30am). Policies for late submission: Each work day that homework is late, 25% of the achievable points are subtracted. Homework is considered a day late if it is turned in after 9:30am the day it is due.

8. **Calculators:** You must have your own scientific calculator. Calculators may be used on quizzes and exams but may not be shared. You may **not** use graphing calculators or any calculators that are capable of information storage or communication on any exam. Simple inexpensive scientific calculators such as the TI-30 series or the Casio fx-260 are acceptable and sufficient for any problem encountered on exams.
9. **Participation Grade:** The participation points (up to 100) will be earned through active participation in class. This is primarily done by using the learning catalytics app on your digital device (smartphone, tablet, notebook PC, *etc.*) to respond to questions asked by the instructor throughout the lectures (see further explanation below under #10).
10. **Learning Catalytics:** In this course, we will use LC on your digital device for you to respond to the instructor's questions and earn valuable points toward your grade. You will need to purchase access and create a student account on <https://learningcatalytics.com/>. Follow instructions on the web site, or in the registration document on your Canvas account (click on Files → LC → Get_Started_Flyer_Learning_Catalytics.pdf) to activate your account and link it to our course, CHM3400. The cost is \$12 for the term. You are required to bring at least one wifi-enabled digital device to class to use for this activity. If you don't have access to a digital device, please contact the instructor.
11. **Class Attendance:** Lecture attendance is essential for your success in this class. However, we will not take roll-calls. Repeated absence in class will make it very difficult to earn full participation points.
12. **Email Policy:** For all course-related business, use your official @ufl.edu gatorlink email address or the e-learning messaging system. The instructors will not respond to emails from other sources (*e.g.*, your gmail or yahoo address).
13. **Students with Disabilities:** Students requiring special accommodations should register with the Dean of Students Office and present documentation from that office to the instructor.
14. **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 on weekends call the Alachua County Crisis Center (352-264-6789). Students may also call the clinician on-call at Student Mental Health for phone callback and consultation at 352-392-1171.
15. **Cell Phones:** Please put all cell phones on “silent mode” during all class periods. Thank you.
16. **Honors Code:** This class will operate under the policies of the student honor code which 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.**

If you have further questions, please contact me. Have a great summer-B term!

Sincerely, Alexander Angerhofer