

INSTRUCTOR: George (Jeff) Gower (jgower@chem.ufl.edu)

Lectures: MWF 4th, 5th, and 8th periods (CLB 130)

Discussion Sections: Tuesdays (multiple periods and locations, beginning **August 29th**)

Office hours: MWF 6th period and MTWRF 9th period (CLB 314, phone: 392-2155)

TEXT: **Chemistry: The Molecular Nature of Matter and Change**

by Martin Silberberg (McGraw-Hill)

This is the textbook we've used for the past several years. Any edition of the book is fine. Any other suitable college-level general chemistry textbook may be used as an alternative reference/study text and source of practice problems for this course.

LECTURES: It will be fully expected that all students are physically present and alert at every lecture. The TopHat student response system (see below*) will be used for lecture participation purposes. The official UF attendance policy can be found at the link below.

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

(Although the lectures will be videorecorded via the Mediasite system (the link to the videorecordings can be found on the course web site under "Files"), this is a very poor substitute for physical attendance and should only be used for lecture review/clarification purposes or in case of unavoidable lecture absence.)

Planned Lecture Schedule (dates are flexible)	Chapter(s)
Aug 21 – 25: Review of Chemical Kinetics: Reaction Rates; Activation Energy; Reaction Mechanisms; Catalysts	16
Aug 28 – Sep 6: Gas-Phase and Heterogenous Equilibria; Le Châtelier's Principle; Reaction Yield Optimization	17
Sep 8 – 13: Brønsted-Lowry Acid-Base Potential and Equilibria	18.1–18.8
PROGRESS EXAM 1 – Thursday, Sep 14 (8:20–10:20pm)	16–18.8
Sep 15 – 20: Acid-Base Titrations and Buffers	19.1–19.2
Sep 22 – 25: Lewis Acid-Base (Electrophile-Nucleophile) Reactions and Mechanisms	18.9
Sep 27 – Oct 4: Solubility Equilibria; Selective Precipitation; Complex Ions and Amphoteric Hydroxides	19.3–19.4
PROGRESS EXAM 2 – Thursday, Oct 12 (8:20–10:20pm)	16–19.4
Oct 9 – Oct 18: Equilibrium Thermodynamics	20
Oct 20 – 30: Oxidation/Reduction Potential; Redox Reactions; Electrochemistry and Equilibria; Voltaic & Electrolytic Systems	21
Nov 1 – 3: Review and Applications of Chemical Potential; Learning to "Think Like a Chemist"	17–21
Nov 6 – 13: Introduction to Inorganic Chemistry	12**,14**,23**
PROGRESS EXAM 3 – Monday, Nov 13 (8:20–10:20pm)	16–21
Nov 15 – 20: Introduction to Organic Chemistry	15**
Nov 27 – Dec 4: Introduction to Nuclear Chemistry	24**
Dec 6: Comprehensive Review and Discussion	Cumulative
FINAL EXAM – Tuesday, Dec 12 (10:00am–12:00noon)	Cumulative

** Topics from these chapters will be selective – lecture coverage will dictate content.

OFFICIAL UF HOLIDAYS (no classes): Sep 4, Oct 6, Nov 10, Nov 22–24

EMAIL: All students must use your official **@ufl.edu email** or have your **@ufl.edu emails** automatically forwarded to your preferred email address. Also, be sure to set your eLearning/Canvas notification preferences so that all class announcements are forwarded to your **@ufl.edu email address**. It is the responsibility of all students to be aware of all emails and announcements related to the course.

***TOP HAT STUDENT RESPONSE SYSTEM:** After the Drop/Add period ends, lecture participation will be facilitated via the Top Hat student response system (<https://tophat.com/>). You will be emailed by Top Hat with instructions on how to register for usage of the system. You'll be able to use your smart phone or lap top or tablet or other applicable device. No clickers required.

Lecture Absence Policy: The lecture (TopHat) participation and Discussion class participation portions of the course can be combined as needed (meaning that if you miss an occasional lecture, you can make up the points in Discussion class, and vice-versa) to earn points toward your course grade (see under "Grades" below). No "make-up" TopHat options will be offered for any reason - no exceptions.

E-LEARNING (Canvas) (<http://elearning.ufl.edu>): It is your responsibility to check the Class Web Site often (as well as your gradebook) to make sure that you do not miss important announcements and other information and to ensure that your gradebook is accurate. Please set your notification preferences so that course announcements are emailed to you, and be sure that you check your UF email frequently. If you have any problems with your GatorLink name or password, you should either go on-line <http://helpdesk.ufl.edu/self-help/>, contact the Help Desk at 392-HELP, or go to 520 CSE for personal assistance. For other computer assistance, visit <http://helpdesk.ufl.edu/>.

DISCUSSION CLASSES: Discussion Classes Begin On Tuesday, August 29th. During the Discussion Classes, students will collectively work on worksheets that relate to the previously covered lecture material. TAs will be available to assist students as they work on the worksheets. Participation will contribute toward your course grade (see under "Grades"), so it is therefore important that you go only to the Discussion Class section for which you are registered. Students: be sure to confirm that your TA properly notes your presence each week – once the class is over, it is impossible to confirm your presence. Worksheet answers will be posted online shortly after each week's Discussion classes are over.

Discussion Class Absence Policy: The lecture (TopHat) participation and Discussion class participation portions of the course can be combined as needed (meaning that if you miss an occasional lecture, you can make up the points in Discussion class, and vice-versa) to earn points toward your course grade (see under "Grades" below). No "make-up" Discussion worksheets will be offered for any reason - no exceptions.

"HOW TO SUCCEED IN COLLEGE CHEMISTRY": This document is posted in the Files folder in Canvas. Read it carefully and do exactly as it says. The detailed structured method of self-assessment strategic study skills in this document has been proven to work many times by many different students over many years (including yours truly). For most students, it is the only way to succeed in the course (and in other courses like this one). Trust me on this: failure to read and do exactly as it says in this document will most likely result in frustration and lack of success in this course for the majority of students. Please do not disregard this advice.

ONLINE PRACTICE PROBLEMS ("QUIZZES"): There will be weekly Online Practice Problem sets posted under the "Quizzes" tool on the Canvas web site for this course. Although you'll be given five (5) submission attempts for each problem set (be sure to write down your answers because you'll have to re-enter them for each submission attempt), your first attempt should be done "cold" (with no outside assistance), as if you were taking an exam or quiz, in order to ASSESS yourself so that you can identify your specific weaknesses with the material as per the "How To Succeed In College Chemistry" document. Successive attempts are to be made after rethinking each question (or, if necessary, after you've obtained help). **Warning:** In order to access the a particular problem set after its due date (for study purposes), you must at least open the problem set and submit an answer prior to the close date/time; failure to do so will result in that problem set being inaccessible to you for the remainder of the semester. It is up to the student to keep track of the schedule and due dates/times - no requests for time extensions on the problem sets will be granted. To help avoid any Canvas or computer issues that may arise, it is suggested that you do the problem sets early enough in the week to avoid last-minute time or computer issues. Each correctly-answered problem will be worth 0.33 points, and the total score sum will be capped at 50 points (of a potential 60+ points) at the end of the semester; a maximum of 50 points will be applied to your course grade (see "Grades" below).

TEXTBOOK END-OF-CHAPTER HOMEWORK:

Suggested homework problems from the end of each chapter in the textbook (6th edition of the Silberberg textbook) will be posted in the "Files" folder on Canvas. Worked-out solutions to all end-of-chapter problems (6th edition) are also found in the Resources folder. Be sure to use this valuable [self-assessment](#) resource. I recommend that students use the Online Homework above to self-assess for weaknesses with the material, and to let the results of that self-assessment guide the students as to which End-Of-Chapter problems need to be done. The more problems you do, the more you develop your skills at solving problems and understanding concepts. If success in this course is important to your goals, do not short-change yourself by merely doing the minimum work needed to "get by". Think about it.

EXAMS: You may only use a non-graphing non-programmable scientific calculator (with log, ln, root, and exponent (scientific notation) functions) on exams (if the exam is announced to be a conceptual-only exam, no calculators will be allowed for that exam). Be sure to also bring pencils, section number, and your UF ID card. No notes, papers, cell phones or other electronic devices can be in view during exams.

All exams are cumulative. Cumulative exams are a necessity in CHM2046 because each successive topic builds upon, and depends upon, previously covered material. Therefore, do not allow yourself to get behind, and always review your previous exams when studying for successive exams.

Exam Conflict/Absence Policy: No make-up Progress Exams will be given after the regularly scheduled Progress Exam date for any reason.

- (1) If you know in advance that you must be absent for a Progress Exam or for the Final Exam due to a documented and approved academic or UF athletic conflict or other pre-approved conflict, bring the applicable documentation to me at least one week prior to the scheduled exam, and an early conflict exam will be arranged for you. Failure to bring documentation and/or obtain one-week pre-approval for the early conflict exam will result in your request being denied.
- (2) If you experience a last-minute unavoidable emergent situation (illness, accident, emergency, etc.) that prevents you from notifying me prior to an exam, and prevents you from attending an exam (verifiable official documentation must be provided that *clearly* indicates that you were *physically unable* to attend the exam), you need to see me in person as soon as you are no longer ill and/or as soon as you are able to do so.

(More information can be found in the General Chemistry Exam Absence Policy document located in the "Files" folder on the course web site.)

Progress Exam "Average/Replace" Policy: (Applies to all students). No Progress Exam scores will be dropped. However, to help alleviate the stress of potential issues that do not fall under the officially-sanctioned absences described above, and that may affect a Progress Exam score (unapproved absence or poor exam performance), the lowest score of the three Progress Exams will be replaced by the average score of all three of the Progress Exam scores:

Example (unapproved absence):

Progress Exam 1, 70%; ProgressExam 2, 0%; Progress Exam 3, 90%

The Progress Exam 2 score (0%) will be replaced by $\{(70+0+90) / 3\} = 53\%$.

Example (poor exam performance):

Progress Exam 1, 70%; ProgressExam 2, 50%; Progress Exam 3, 90%

The Progress Exam 2 score (0%) will be replaced by $\{(70+50+90) / 3\} = 70\%$.

Missing scores (or questionable zero scores) and checking your scantron: If your exam score is MISSING from your e-Learning gradebook, or if your exam score is ZERO and you do not think this score is correct, please contact me ASAP. It could be that your UF ID was not properly bubbled in. Scantrons may be viewed during the one-week period of office hour sessions (in CLB 314) following the posting date of the exam score in your Canvas gradebook. Bubbling errors made on scantrons (mis-bubbled exam question answers or mis-bubbled Form Code) can not be negotiated.

CHEMISTRY LEARNING CENTER (CLC): There is free help to be had from graduate student teaching assistants in the CLC Monday through Friday in Hernandez Hall room 105. Your discussion TA will have office hours in the CLC, but you may go there anytime any TA is assigned there to get help on questions pertaining to chemistry. A schedule of the TA schedules will be posted in the corridor outside the CLC and also on e-Learning. And, there is the **TEACHING CENTER** located on the ground floor of

Broward Hall, if you'd like to use that resource. Their web site is <http://www.teachingcenter.ufl.edu>

INSTRUCTOR EMAIL and OFFICE HOURS: Course administrative queries only can be emailed to me (from your official UF email account: student@ufl.edu). Please always indicate your course (whether CHM2045 or CHM2046) when emailing. Chemistry and course-content queries should be made in person during scheduled office hours in CLB 314 or immediately after lectures in CLB 130 if time permits. If these options are not possible, and you have questions regarding chemistry understanding, please visit the CLC (see below) where TAs are available to help you. Please consult the online chapter solutions (if applicable) before coming to office hours. Please also understand that **office hours are not study sessions**. When you come to office hours, be sure your queries are pre-prepared and that you are ready to discuss the queries as soon as you arrive; **do not plan to sit and study or do practice problems during office hour time.**

GRADES: Course grades for the term will be earned as follows:

Assignment/Assessment Type	Points / % of Grade
Progress Exams	600 / 60%
Practice Problems (max. 50 pts. of potential 60+ pts)	50 pts / 5%
Lecture and Discussion Class Participation***	100 pts / 10%***
Final Exam	250 pts / 25%
TOTAL	1000 pts / 100%

***Discussion and Lecture participation points will be combined and will be capped at a maximum of 100 points and will count toward a combined 10% of course grade.

The following grade cutoffs will be used (these are non-negotiable):

90-100% = A 86-89% = A- 83-85% = B+ 80-82% = B 76-79% = B-
73-75% = C+ 70-72% = C 66-69% = C- 63-65% = D+ 60-62% = D
< 60% = E

For further information on UF's Grades and Grading Policies, go to <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

INSTRUCTOR EVALUATIONS: Students are expected to provide feedback on the instruction in this course by completing online evaluations at <https://evaluations.ufl.edu> during the last two or three weeks of the semester. Students will be emailed with specific times when the online evaluations are open. Summarized results of previous evaluations are available to students at <https://evaluations.ufl.edu/results/>.

HONOR CODE: (<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>)

The UF Student Honor Code applies to all exams and assessments given in this course. Please understand that absolutely no leniency will be extended in any case of academic dishonesty.

DISABILITIES / STUDENT MENTAL HEALTH COUNSELING: Students requesting classroom and exam accommodations should contact the Dean of Students Disability Resources Center (DRC) at 392-8565 or <http://www.dso.ufl.edu/drc/> and obtain the proper forms that need to be turned in to me during the first week of class or as soon as possible after obtaining the paperwork from the DRC. It is the student's responsibility to schedule and arrange accommodations with the DRC. Students may seek mental health counseling at any time. See <http://www.counseling.ufl.edu/cwc/>.

COURSE INFO: CHM 2046 and CHM 2046L constitute the second semester of the two term sequence of General Chemistry, CHM 2045-2045L-2046-2046L. This sequence is suitable for all science and engineering majors.

GENERAL EDUCATION CREDIT: This course is available for general education credit. This course introduces students to fundamental concepts of chemistry including bonding, atomic and molecular structure, chemical reactions, states of matter, reaction rates, chemical thermodynamics and equilibria. The scientific method and the place of chemistry in the everyday world are emphasized.

PROGRAM OBJECTIVES: General Chemistry and Qualitative Analysis (aka General Chemistry II, or CHM2046) covers the basic concepts, theories and terms related to chemical equilibria, thermodynamics, elemental characteristics, and the chemical potentials associated with chemical species in systems covered in the course. The course will focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes and potentials that govern and characterize the discussed chemical systems. Students will formulate empirically-testable hypotheses derived from the study of these systems, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate potential outcomes of chemical processes. In addition to the described educational objectives of the course, it is also expected that preparatory objectives will be met and surpassed, with regard to rendering students equipped for success in future courses in the physical sciences, by way of a sound competency with the CHM2046 material and how it relates to earlier studies (CHM2045 and earlier) and later studies in chemistry and other scientific disciplines.

These objectives will be accomplished through interactive participation in the course lectures and discussion sections, and individual work done on provided guided and structured homework resources. Successful achievement will be assessed through weekly discussion section quizzes and monthly Progress Exams, as well as a Final Exam.

GENERAL EDUCATION STUDENT LEARNING OUTCOMES: The following learning outcomes (see table below) will be assessed through monitored Discussion Section preparation and participation, as well as through online assessments and progress (mid-term) examinations and final examinations.

GENERAL EDUCATION STUDENT LEARNING OUTCOMES, continued:

Area	Institutional Definition	Institutional SLO
CONTENT	Content is knowledge of the concepts, principles, terminology and methodologies used within the discipline.	Students demonstrate competence in the terminology, concepts, methodologies and theories used within the discipline.
COMMUNICATION	Communication is the development and expression of ideas in written and oral forms.	Students communicate knowledge, ideas, and reasoning clearly and effectively in written or oral forms appropriate to the discipline.
CRITICAL THINKING	Critical thinking is characterized by the comprehensive analysis of issues, ideas, and evidence before accepting or formulating an opinion or conclusion.	Students analyze information carefully and logically from multiple perspectives, using discipline specific methods, and develop reasoned solutions to problems.