

CHM 2046	General Chemistry 2 Gower Sections	Spring 2017
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INSTRUCTOR: George (Jeff) Gower (jgower@ufl.edu)

Lectures: MWR 9th Period (CLB 130)

Discussion Classes: Tuesdays (period and room depends on section number)

Office hours: MWR 6th–7th Periods (CLB 314, 392-2155)

PREREQ: Grade of C or higher in CHM 2045.

TEXT: **Chemistry: The Molecular Nature of Matter and Change (6th Edition)**

by Martin Silberberg (McGraw-Hill)

This is the suggested textbook (and edition thereof) primarily because worked-out solutions are provided for each end-of-chapter problem in this particular edition of this particular textbook. However, any earlier edition of this textbook, or any other suitable college-level general chemistry textbook, may be used as a reference/study text and source of additional practice problems for this course.

LECTURES: It will be fully expected that all students are physically present and alert (cell phones put away) at every lecture. Please understand that exam questions will be prepared with this expectation in mind. The official UF attendance policy can be found at the link below. <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> (There will be no lectures on Progress Exam days)

(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 clarification purposes or in case of rare but unavoidable lecture absence.)

Planned Lecture Schedule	Chapter(s)
Jan 4 – 5: Chemical Kinetics; Integrated Rate Laws; Activation Energy; Reaction Mechanisms; Catalysts	16
Jan 9 – 18: Gas-Phase and Heterogenous Equilibria; Le Châtelier’s Principle; Reaction Yield Optimization	17
Jan 19 – 30: Brønsted-Lowry Acid-Base Potential and Equilibria; Acid-Base Titrations and Buffers	18.1–19.2
PROGRESS EXAM 1 – Tuesday, Jan 31 (8:20–10:20pm)	16–18.8
Feb 1: Lewis Acid-Base Reactions (Electrophile-Nucleophile)	18.9
Feb 2 – 13: Solubility Equilibria; Selective Precipitation; Complex Ions and Amphoteric Hydroxides	19.3–19.4
Feb 15 – 23: Equilibrium Thermodynamics	20
PROGRESS EXAM 2 – Wednesday, Mar 1 (8:20–10:20pm)	16–19.4
Feb 27 – Mar 20: Oxidation/Reduction Potential; Redox Reactions; Electrochemistry and Equilibria; Voltaic and Electrolytic Systems	21
Mar 22 – 27: In-Depth-Review and Applications of Chemical Potential and Equilibrium; Learning to “Think Like a Chemist”	17–21
PROGRESS EXAM 3 – Wednesday, Apr 5 (8:20–10:20pm)	16–21
Mar 29 – Apr 3: Introduction to Inorganic Chemistry	12**,14**,23**
Apr 5 – 12: Introduction to Organic Chemistry	15**
Apr 13 – 19: Introduction to Nuclear Chemistry	24**
FINAL EXAM – Tuesday, April 25 (10:00am–12:00noon)	Cumulative

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

OFFICIAL UF HOLIDAYS (no classes): Jan 16 (MLK), Mar 6 – 10 (SpringBreak)

E-LEARNING (<http://elearning.ufl.edu>): We will be using the **CANVAS** option in E-Learning for this course. Here you will find the syllabus, your gradebook for the class, selected lecture material, Online-Practice-Problems (under "Quizzes"), lecture video links, files, Suggested-End-Of-Chapter-Problem solutions, class announcements, and other pertinent info for the course. 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. If you have any problems with your GatorLink name or password, you should either go on-line <http://www.gatorlink.ufl.edu> , 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, January 10th. During the Discussion Classes, students will collectively work on worksheets that relate to the recently covered lecture/tutorial material. TAs will be available to assist students as they work on the worksheets. Attendance and participation (monitored) will contribute toward your course grade (see under "Grades" in this syllabus), 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 – be diligent to make sure that you are being properly acknowledged as being present for each class – once the class is over, it is impossible to confirm your presence. Worksheet answers will be posted in Canvas at the end of the day each Tuesday.

Discussion Class Absence Policy: To help alleviate concerns over missed Discussion Class due to emergencies or personal matters/events (illnesses, accidents, family emergencies, weddings, funerals, etc.), or to alleviate any worries about missed Discussion Classes due to academic or athletic or any other such conflicts, students are allowed to miss up to four (4) out of 14 Discussion Classes with no resulting penalty to your grade. Once the four allowed absences have been reached, there will be no further accommodation or negotiation regarding additional missed classes, regardless of the reason – no exceptions. So be sure to use your allowed misses judiciously.

"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).

SUGGESTED-END-OF-CHAPTER (EOC) PROBLEMS: These are problems from the Silberberg 6th edition (see top of syllabus) textbook that are selected based on their appropriateness for the course. The complete worked-out solutions are posted in Canvas for each and every EOC problem in this textbook – be sure to utilize this valuable self-assessment resource! These problems are also recommended for self-assessment preparation for exams. (Again, read the “How To Succeed In College Chemistry” document for vital strategies for success in this course when doing EOC problems).

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): Tutoring from graduate student TAs is available in the CLC Mon-Friday in Flint Hall 257. 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 in Canvas.

And, there is the **TEACHING CENTER** located on the ground floor of Broward Hall, if you'd like to use that free 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: Grades for the term will be determined as follows:

Activity / Assessment	Max pts
Online Practice Problems (max. 50 pts. of potential 60+ pts)	50 pts
Discussion-Class Worksheets (10 out of 14 @ 10 pts)	100 pts
Progress Exams	400 pts
Final Exam	250 pts
TOTAL	800 pts

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 given specific times when they are open. Summarized results of these 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.