

CHM2045 – GENERAL CHEMISTRY I – Fall 2020

INSTRUCTOR: Dr. Martina Sumner e-mail (for administrative purposes):
m.sumner@chem.ufl.edu

OFFICE HOURS: MWF during Period 1 (7:25 to 8:15 am) & Period 3 (9:35 to 10:25 am)

Zoom link: <https://ufl.zoom.us/j/9593638673?pwd=Q3cwY3A4T09UemE2Vmo0ZEwyMC9xZz09>

When you attend office hours and ask a question I expect to be able to see you via your camera on zoom.

COURSE SCHEDULE (the lecture schedule is tentative, but exam dates will not change):

Class date	Topic	Before class	Silberberg 8 th Chapters*
Aug. 31	Chapters 1-2	Read syllabus, familiarize yourself with canvas	Ch. 1-2
Sept. 2	Ch. 3.1-3	PLA Ch. 3.1-3	Ch. 3.1-3
Sept. 4	Ch. 3.4 stoichiometry	PLA Ch. 3.4	Ch. 3.4
Sept. 7	Labor Day Holiday		
Sept. 9	Ch. 4.1 through 3 solution concentration, writing net ionic eq and precipitation reactions	PLA Ch. 4.1-3	Ch. 4.1-3
Sept. 11	Ch. 4.4 acid-base reactions	PLA Ch. 4.4	Ch. 4.4
Sept. 14	Ch. 4.5 and 6 redox reactions	PLA Ch. 4.5/6	Ch. 4.5
Sept.16	Ch. 4 review (no new material)	PLA Ch. 4 review	Ch. 1-4
	Exam 1 (Ch. 1-4) Wed., Sept. 16		
Sept. 18	Ch 5.1/2/3 overview of gases, P, gas laws	PLA Ch. 5.1/2/3	Ch. 5.1/2/3
Sept. 21	Rearrangement of ideal gas law	PLA Ch. 5.4	Ch. 5.4
Sept. 23	KMT and real gases	PLA Ch. 5.5/6	Ch. 5.5/6
Sept. 25	Forms of energy; enthalpy	PLA Ch.6.1/2	Ch. 6.1/2
Sept. 28	Calorimetry: Constant V and const. P	PLA Ch. 6.3	Ch. 6.3
Sept. 30	Stoichiometry of thermochemical rxn, Hess's Law, ΔH of formation	PLA Ch. 6.4/5/6	Ch. 6.4/5/6
Oct. 2	Ch 6 review		

Oct. 5	Chemical kinetics: expressing reaction rate; rate law and its components	PLA Ch. 16.1/2/3	Ch. 16.1/2/3
Oct. 7	Integrated rate laws	PLA Ch. 16.4	Ch. 16.4
Oct. 9	Reaction mechanisms	PLA Ch. 16.6	Ch. 16.6
Oct. 12	Theories of chemical kinetics and catalysis	PLA Ch. 16.5/7	Ch. 16.5/7
Oct. 14	Ch 16 review		
Oct. 16	Nature of light	PLA Ch. 7.1	Ch. 7.1
Oct. 19	Quantum mechanical model of atom	PLA Ch. 7.4, 8.1/2	Ch. 7.4
	Exam 2 (Ch. 5, 6, 7,16) Tues. Oct. 20		
Oct. 21	Trends in atomic properties (atomic size, ionic size)	PLA Ch. 8.2	Ch. 8.2
Oct. 23	Trends in atomic properties	PLA Ch. 8.3	Ch. 8.3
Oct. 26	Ionic bonding model	PLA Ch. 9.1/2	Ch. 9.1/2
Oct. 28	Covalent bonding model and bond energy	PLA Ch. 9.3/4	Ch. 9.3/4
Oct. 30	Electronegativity and bond polarity	PLA Ch. 9.5/6	Ch. 9.5/6
Nov. 2	Lewis structures, resonance, formal charge	PLA Ch. 10.1	Ch. 10.1
Nov. 4	VSEPR	PLA Ch. 10.2	Ch. 10.2
Nov. 6	Molecular shape and polarity	PLA Ch. 10.3	Ch. 10.3
Nov. 9	Valence bond theory, modes of orbital overlap	PLA Ch. 11.1/2	Ch. 11.1/2
Nov. 11	Veterans Day Holiday no class		
Nov. 13	Molecular orbital theory (MO)	PLA Ch. 11.3	Ch. 11.3
Nov. 16	Physical states; phase changes, heating curve calculations	PLA Ch. 12.1/2	Ch. 12.1/2
Nov. 18	Intermolecular forces, liquid state, and uniqueness of water	PLA Ch. 12.3/4/5	Ch. 12.3/4/5
Nov. 20	Exam 3 (Ch. 8-11) Fri, Nov. 20		
Nov. 23	Review day or continue chapter 12 or no class		
Nov. 25-28	Thanksgiving Holiday		
Nov. 30	The solid state: structure, properties, and bonding	PLA Ch. 12.6	Ch. 12.6/7
Dec. 2	Types of solutions; why substances dissolve	PLA Ch. 13.1/2/3	Ch. 13.1/2/3

Dec. 4	Solubility as an equilibrium process; concentration terms	PLA Ch. 13.4/5	Ch. 13.4/5
Dec. 7	Colligative Properties	PLA 13.6	Ch. 13.6
Dec. 9	Review ch 12 and 13		
Dec. 14	Monday: Final exam 7:30 to 9:30 am		

*The topics that will be covered from each chapter will be selective and announced on canvas via an announcement.

Holidays (no classes): Monday, Sept. 7 (Labor Day); Wednesday, Nov. 11 (Veterans Day);

Wednesday through Friday, Nov. 25-27 (Thanksgiving)

REQUIRED MATERIALS:

You are required to have a functioning webcam, small handheld mirror, microphone, and speakers for proctored exams. See the minimum technical requirements at honorlock.com/support.

RECOMMENDED MATERIALS:

Silberberg and Amateis, 8th ed. (PLAs will have sample problems from the 8th ed- see below), Chemistry, the molecular nature of matter and change, can get eBook for less than \$50 for 5 years – available for a limited time.

<https://www.bsd.ufl.edu/G1CO/IPay1f/start.aspx?TASK=INCLUDED>

You will also need a non-graphic / non-programmable **scientific calculator** like the TI (Texas instrument series) or Casio. TI-36 does quadratic function which will be helpful in chm2046.

Optional: eBook of Student Solutions Manual made specifically for this course. Title:

GENERAL CHEMISTRY - CHM 2045, ISBN: 9781307629521 and can be purchased here:

<https://create.mheducation.com/shop/> through McGraw Hill or through UF Bookstore.

DESCRIPTION: CHM 2045 and CHM 2045L constitute the first semester of the two-term sequence of General Chemistry, CHM 2045/2045L - 2046/2046L. CHM2045 is a 3-credit class. This class will be taught synchronously, i.e. you have to attend your weekly discussion classes via zoom. Prerequisite information and credit suitability can be found in the Undergraduate Catalog. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

ALEKS: Two percent of the course grade will be based on completion of the Aleks prep course. The deadline for completion of the Aleks prep course is **Friday, September 18th**. The following shows the points you can earn based on completion:

% ALEKS Completion	0 – 69%	70 – 79%	80 – 89%	90 – 98%	99 - 100%
% of grade earned	0%	0.5%	1.0%	1.5%	2.0%

For more info and how to register please see <https://www.chem.ufl.edu/undergraduate/aleks/>

COURSE OBJECTIVES: As both a general education requirement and major's course, CHM2045 serves to teach: the scientific method, skills for problem solving, general chemistry knowledge, and a connection to the principles that govern the natural world.

GRADES: Grades for the term will be determined as follows:

3 Progress Exams	60%
Final Cumulative Exam	23%
Aleks	2%
Worksheets	5%
PLA / DLQ / HW	5%
Quizzes/ Proficiency quizzes	5%
TOTAL	100%

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

90-100% = A	83-85.9% = B+	73-76.9% = C+	66-68.9% = D+	< 60 = E
86-89.9% = A-	80-82.9% = B	69-72.9% = C	63-65.9% = D	
	77-79.9% = B-		60-62.9% = D-	

A minimum grade of C is required for general education credit. Information on current UF grading policies for assigning grade points can be found at:

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

POSTED GRADES: Should a student wish to dispute any grade received in this class, the dispute must be in writing (via e-mail to m.sumner@chem.ufl.edu) and submitted within one week of the grade being posted to canvas. After one week has passed from when the grade was posted and the student made aware of the posting of the grade(s) via an announcement on canvas, the instructor considers those grades final.

PRE-LECTURE ASSIGNMENTS (PLA): You will be expected to complete pre-lecture assignments in preparation for each class day. These assignments will be posted on Canvas under the quizzes tab (and under Modules for each chapter) and will be due prior to class. You will have multiple attempts to successfully answer the pre-lecture assignments.

DURING LECTURE QUIZZES (DLQ): You will be expected to complete a during lecture quiz while you watch the lecture. These quizzes are posted on Canvas under the quizzes tab (and under Modules for each chapter) and will be due at the end of the lecture day by 11:59 pm. You will have 3 attempts to successfully answer the DLQ.

HOMEWORK (HW): Several homework assignments will be due per chapter to help you understand the material. The homework will be posted on Canvas under the quizzes tab (and under the Module for that chapter). You will have multiple attempts to successfully answer the questions. Up to six assignments will be dropped at the end of the semester from the PLA/ DLQ/

HW category. Additional HW assignments for each chapter can be found under Quizzes (and under the Module for that chapter), then scroll down to Practice Quizzes. These are not worth any points.

You should also work numerous EOCs. The solution manual for all EOCs are available in the Marston Science library.

QUIZZES: 3.5 percent of the course grade will be based on quizzes. These quizzes are checks on your progress, i.e. are you ready for the upcoming exam. There could be a quiz every Thursday (available for 24 hours and due by 11:59 pm). So be prepared. I will let you know via an announcement on canvas. You must work individually on these quizzes to gauge your mastery of the material and to give you a reality check on what you know or do not know. Treat each quiz as a mini exam (as a trial to see whether you are prepared for an exam).

PROFICIENCY QUIZZES: 1.5 percent of your grade will come from the Proficiency Quizzes. This semester, CHM2045 will be part of an ongoing Chemical Education Research project within the Department of Chemistry at UF. The study will look at exam performance in CHM2045 in correlation with quiz performance. All students, irrespective of whether they wish to participate in the study, will complete a minimum of three to a maximum of nine Proficiency quizzes over the course of the semester as part of their regular workload. For each exam, a set of 3 Proficiency Quizzes will be available. The higher score of each set will contribute to the course grade for a total of 1.5-% (3 PQs are required, each worth 0.5-% of the course grade); the 2 lower scores will be dropped. You may complete one, two, or all three PQs in each set. Students will be randomly assigned to one of two groups, and the timing of the quizzes will vary from group to group. To participate in the study, students will complete the Informed Consent Form Survey through a Canvas Survey by September 9, 2020. Participation means that you agree to allow your exam and quiz grades to be collected for research. Participation does not influence your course grade in any way. **Please note that you will have to complete the quizzes to earn a portion of the course grade, and they are graded based on correctness, not completion.** If you do not wish to participate in the study and have your exam and quiz scores removed from the collected data, you still must take the assigned Proficiency quizzes. Each quiz is designed to be completed within a 30-minute time frame and will be available for two days during the school week. We ask you to participate in the study since the data collected may lead to future improvements of CHM2045/2046. *Special note: Extensions for missed Proficiency Quizzes will not be granted for any reason. However, if you have DRC accommodations for extra time, please email your accommodation letter to Kaylee Todd at kmtodd8485@chem.ufl.edu.* In addition to the quizzes, two surveys will be administered through Canvas – the first after the first during-term exam and the second before the final exam. The surveys should take no more than 10-15 minutes to complete. The surveys will be scored for completion, and the scores may contribute to the course grade at the instructors' discretion.

DISCUSSION CLASSES/ WORKSHEETS: The Discussion Classes meet every Tuesday and your attendance is **mandatory**. 5 points will be awarded when you attend your TA's zoom

session. The worksheet is worth 5 points. A total of 10 points can be earned each week by attending your discussion zoom class and correctly answering the worksheet questions. The worksheets will be posted on Canvas in advance and you may start working on it before you come to discussion. A canvas quiz will open on Wednesday and due by 11:59 pm (5 questions randomly selected from the worksheet). Any grade discrepancy needs to be addressed within a week of posting grades to canvas to your graduate TA.

HONORLOCK: Honorlock will proctor your exams this semester. Honorlock is an online proctoring service that allows you to take your exam from the comfort of your home. You DO NOT need to create an account, download software or schedule an appointment in advance. Honorlock is available 24/7 and all that is needed is a computer, a working webcam, and a stable Internet connection. <https://warrington.ufl.edu/covid-19/information-for-for-students/honorlock-student-guide/> more info on Honorlock

To get started, you will need Google Chrome and to download the Honorlock Chrome Extension. You can download the extension at www.honorlock.com/extension/install

When you are ready to test, log into Canvas, go to your course, and click on your exam. Clicking "Launch Proctoring" will begin the Honorlock authentication process, where you will take a picture of yourself, show your ID, and complete a scan of your room. You will need a small handheld mirror so you can show your computer screen to the camera and also show underneath your table or desk. Honorlock will be recording your exam session by webcam as well as recording your screen. Honorlock also has an integrity algorithm that can detect search-engine use, so please do not attempt to search for answers, even if it's on a secondary device.

Good luck! Honorlock support is available 24/7/365. If you encounter any issues, you may contact them by live chat, phone (855-828-4004), and/or email (support@honorlock.com).

EXAMS: Exams are 120 minutes each and up to 30 questions. Exams will be administered at night from 6:00pm to 10:20pm (Eastern time) via Honorlock. Exam questions will consist of questions like the HW/PLA/worksheet/quizzes/PQ you have completed on Canvas. So expect numeric entry, multiple dropdowns, multiple answer, true/false, multiple choice, matching, and multiple fill in the blanks. You must use a non-graphing non-programmable scientific calculator on exams (with log, ln, root, and exponent (scientific notation) functions).

All exam grade disputes must be performed within one week of the scheduled exam date.

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 attending an exam, you must do the following: (1) contact the Dean of Students office and have them confirm your conflict documentation and have them email their confirmation to me, and then you must (2) contact the current instructor of the course as soon as you are no longer ill (no rush – wait until you are well) and/or as soon as you are able to do so. Failure to do these two steps will result in a zero score for the missed exam. (More information regarding this policy can be found in the [General Chemistry Exam Absence Policy](#) found on Canvas.)

Progress Exam "Average/Replace" Policy: (Applies to all students). No Progress Exam scores will be dropped for any reason. To alleviate the stress of potential issues that do not fall under officially-sanctioned absences, we've incorporated an "average/replace" policy (the lowest of the three progress exams will be replaced by the average of the three progress exams). This "average/replace" policy will help to minimize the impact of a single poor performance but it will not completely disappear. Example: exam 1 140, exam 2 100, exam 3 180, so average replace 140, so the 100 will be replaced with 140. Another example: exam 1 140, exam 2 0 (missed), exam 3 180, so average of the three exams is 106.67 so the 0 will be replaced with the 106.67.

CONTACTING THE INSTRUCTOR / OFFICE HOURS: Emails are for administrative purposes only, and not for distance-instruction. All academic inquiries must be made during Zoom office hours. If this is not possible, visit the graduate TAs zoom office hours (schedule posted on Canvas). Please be prepared before coming to office hours, bring specific questions and your previous work.

CHEMISTRY LEARNING CENTER (CLC): There is free help to be had from graduate student teaching assistants via zoom. Your discussion TA will have office hours on zoom. You will also receive zoom links for the other chm2045 graduate TAs so you may attend any TAs zoom office hours. Additionally, there is the teaching center <http://www.teachingcenter.ufl.edu> which offers some resources for being successful in your chm2045 class.

HONOR CODE: UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Honor Code (<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

You will receive a 0 for the exam if cheating has been detected.

CANVAS (<http://elearning.ufl.edu>): Here you will find the syllabus, gradebook, files, class announcements, and other pertinent info for the course. It is your responsibility to check

Canvas often to make sure that you do not miss important announcements and to ensure that your gradebook is accurate. For computer assistance, visit <http://helpdesk.ufl.edu/>.

DISABILITIES: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <http://www.dso.ufl.edu/drc/>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible.

UF MULTICULTURAL & DIVERSITY AFFAIRS: Department within the Division of Student Affairs. Multicultural and Diversity Affairs (MCDA) celebrates and empowers diverse communities and advocates for an inclusive campus for all students across identities. MCDA is located on the second level in the student union. <https://multicultural.ufl.edu/>

U MATTER, WE CARE: Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

COUNSELING AND WELLNESS CENTER: Visit counseling.ufl.edu/ or call 352-392-1575 for information on crisis services as well as non-crisis services.

UF TEACHING CENTER (CLAS): Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring. teachingcenter.ufl.edu/

INCLUSIVE LEARNING ENVIRONMENT: We embrace the University of Florida's Non-Discrimination Policy, which reads, "The University shall actively promote equal opportunity policies and practices conforming to laws against discrimination. The University is committed to non-discrimination with respect to race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinion or affiliations, genetic information and veteran status as protected under the Vietnam Era Veterans' Readjustment Assistance Act." We are committed to fostering an open and inclusive classroom and laboratory environment in our College, where every student, guest instructor and contributor feels valued. If you have questions or concerns about your rights and responsibilities for inclusive learning environment, please see your instructor or refer to the Office on Multicultural & Diversity Affairs Website: <http://www.multicultural.ufl.edu/>

EVALUATIONS: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.”

GENERAL EDUCATION REQUIREMENTS: This course satisfies the general education program requirements for the physical sciences at the University of Florida. More information regarding the program objectives, student learning outcomes, and specific goals for CHM2045/CHM2046 can be found in the *General Education Program Requirements* document found on Canvas.

CRITICAL THINKING: Critical thinking skills are essential in the general chemistry course. There are six criteria by which we promote critical thinking: 1. Information acquisition: Identifying and differentiating questions, problems, and arguments. 2. Application: Assessing the suitability of various methods of reasoning and confirmation when approaching a problem. Students are taught to develop hypotheses and to find support and limitations associated with their hypotheses. 3. Analysis: Identifying and analyzing stated and unstated assumption and using logical reasoning to evaluate different viewpoints. 4. Synthesis: Students are encouraged to formulate questions and problems, construct arguments to address such questions and be able to effectively communicate conclusions. 5. Communication: In discussion of alternative points of view, students will be encouraged to criticize or defend their arguments with the use of logical reasoning and evidence. 6. Evaluation: Assessing the quality of evidence and reasoning to draw reasonable conclusions.

MATHEMATICS: It is crucial in the general chemistry course to be competent in mathematics. Listed are the criteria by which we promote understanding and application of math: 1. Information acquisition: Students learn to select data that is pertinent to solving a problem. 2. Application: Use of algebraic, geometric, and statistical reasoning to solve problems. 3. Analysis: Interpret and draw conclusions from formulas, graphs, and tables. 4. Synthesis: To associate patterns and observations to more abstract principles and to consider specific applications of such principles. 5. Communication: Communicating information symbolically, graphically, numerically, and verbally. 6. Evaluation: Estimate and verify solutions to mathematical problems to determine reasonableness, compare alternatives and select optimal results and understand the limitations of mathematical and statistical methods.

COLLEGE CHEMISTRY STUDY TIPS: Success in college-level chemistry primarily requires two things: A strong conceptual understanding of the material, and a competent mastery of quantitative problem-solving strategies that are required to successfully answer word problems that are typical on exams. This means that you must read your textbook and PowerPoint slides and understand them. Then you **MUST PRACTICE** problems in your textbook and on Canvas so that you can diagnose your own strengths and weaknesses with the material. The more

practice with problems that you do, the more likely you will recognize and know how to approach different kinds of problems, even if you have never seen identical questions before. Use the following suggestions as a guide:

1. Attempt each of the end-of-chapter problems one at a time, then check their solutions.
2. If you succeeded in getting the correct answer the first time without looking at the solution, check off that problem in the book, and if you did not succeed in getting the correct answer the first time without looking at the solution, circle the problem number.
3. Re-attempt the circled problems the next day or a few days later to see if you get the correct answer without looking at the solution.
4. Repeat steps 2 and 3 if necessary. Never assume that you have understood or succeeded at a problem until you have obtained the **CORRECT** answer all on your own and **NEVER** merely look at the solutions and say "oh yeah, I see what I did wrong", and move on.

Merely "doing all the problems at the end of the chapters" does not equal "doing all the problems at the end of the chapters correctly". The aim is not only to work hard, but to also work productively.

Giving yourself a "grade" after each session will keep you mentally on track regarding how you are performing at that time.

ADDITIONAL STUDY HABITS: Any Chemistry course demands a regular sustained effort throughout the semester. This course requires on average 6 – 8 hours per week of work outside of lecture. You are expected to read the appropriate pages from the textbook (or similar chapters in other textbooks) prior to coming to class. The instructor will build on this material and you are expected to be able to follow in-class discussion. Mastering this course is primarily **your** responsibility and I am here to help you at all times in your endeavor to be successful. One of the most important things that you should learn while in college is that you must learn to identify your own weaknesses and strengths with the material in your courses and work on those weaknesses by displaying a sense of responsibility for your own learning. Most importantly, do not allow yourself to fall behind because the material builds up. If you find that you are not grasping essential material by reading the textbook and following in-class discussion, **seek help early!** Visit your instructor's office hours, talk to other students in your class, compare notes, form a study group, practice as many problems as you can, consult other textbooks, go to the LRC, *etc.*

Cramming overnight will not guarantee a favorable result.

Disclaimer: This syllabus represents our current plans and objectives. If those need to change as the semester progresses, then the changes will be communicated to the class clearly via announcements on Canvas.