**CHM2046 − GENERAL CHEMISTRY II – SPRING 2021**

## INSTRUCTOR:


**Dr. Steven Harris**

E-mail: Please contact via Canvas
(for administrative purposes): steven.harris@chem.ufl.edu


**Office Hours (via Zoom):** MWF 1:30 to 2:30 pm

https://ufl.zoom.us/j/95312798936?pwd=b2R1SWFWeXdtSmhlbEdDWDM1WWpldz09

Meeting ID: 953 1279 8936

Passcode: 8y188g

**TEACHING ASSISTANTS (TAs):** Available for office hours and discussions (see canvas)

**Loc Huynh:** lochuynh@chem.ufl.edu

**Jarrad Pazda:** jarradpazda@chem.ufl.edu

**Tao Yuwen:** tao.yuwen@chem.ufl.edu

This course will be delivered face-to-face and online/synchronously. Course content will be delivered through the Canvas course shell and required discussion meetings will occur via the Zoom platform during your scheduled discussion period.

## FOR IN PERSON SECTIONS- COVID practice:

In response to COVID-19, the following policies and requirements are in place to maintain your learning environment and to enhance the safety of our in-classroom interactions.

1. You are required to wear approved face coverings at all times during class and within buildings. Following and enforcing these policies and requirements are all of our responsibility. Failure to do so will lead to a report to the Office of Student Conduct and Conflict Resolution.
2. This course has been assigned a physical classroom with enough capacity to maintain physical distancing (6 feet between individuals) requirements. Please utilize designated seats and maintain appropriate spacing between students. Please do not move desks or stations.
3. Sanitizing supplies are available in the classroom if you wish to wipe down your desks prior to sitting down and at the end of the class.
4. You may enter CLB130 via any of the 4 doors. I will take attendance the first minute of class. If you are late please let me know at the end of the period so I can mark you as present. Practice physical distancing to the extent possible when entering and exiting the classroom.

If you are experiencing COVID-19 symptoms (Click here for guidance from the CDC on symptoms of coronavirus), please use the UF Health screening system and follow the

instructions on whether you are able to attend class. Click here for UF Health guidance on what to do if you have been exposed to or are experiencing Covid-19 symptoms.

If you can't attend class in person you will then attend class via zoom until you are cleared to return to the classroom. Find more information in the university attendance policies.

**FOR ONLINE SECTIONS OF THE CLASS:** Our class sessions are visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

https://policy.ufl.edu/policy/student-behavioral-expectations-in-response-to-covid-19/

**Lecture (via Zoom):** MWF 3:00 to 3:50 pm

https://ufl.zoom.us/j/96178746359?pwd=cndVZ2p4V3ZwTXc2RlVRbGlyMXM0dz09

Meeting ID: 961 7874 6359

Passcode: 3q190v

**COURSE SCHEDULE (the lecture schedule is tentative, but exam dates will not change, PLAs and HW can be found under Quizzes in canvas):**

| Date | Topic | Before class | Silberberg 8th Chapters* |
|---|---|---|---|
| Jan 11 | Kinetics; rate law, integrated rate law, rate constant, mechanisms, theories of chem kinetics | Read syllabus, check out canvas, PLA Ch. 16.6/7 | Ch. 16 |
| Jan 13 | Chemical Equilibrium; K and Q | PLA Ch. 17.1/2 | Ch. 17.1-2 |
| Jan 15 | Chem eq; relation between Kc and Kp, comparing Q and K | PLA Ch. 17.3/4 | Ch. 17.3-4 |
| **Jan. 18** | **Martin Luther King, Jr. Holiday** | | |
| Jan 20 | How to solve eq problems | PLA Ch. 17.5 | Ch. 17.5 |
| Jan 22 | More solving eq problems, LeChatelier's principle | PLA Ch. 17.5/6 | Ch. 17.5-6 |

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|---|---|---|---|
| Jan 25 | LeChatelier's principle | PLA Ch. 17.6 | Ch. 17.6 |
| Jan 27 | Acid-Base Eq.; autoionization of water, pH scale | PLA Ch. 18.1/2 | Ch. 18.1-2 |
| Jan 29 | Bronsted-Lowry acid/base definitions | PLA Ch. 18.3 | Ch. 18.3 |
| Feb 1 | Solving problems involving weak acid eq. | PLA Ch. 18.4 | Ch. 18.4 |
| Feb 3 | Molecular properties and acid strength; weak bases | PLA Ch. 18.5/6 | Ch. 18.5-6 |
| Feb 5 | Acid-Base Properties of Salt solutions | PLA Ch. 18.7 | Ch. 18.7 |
| Feb 8 | Lewis Acid-Base definitions, electron-pair donation | PLA Ch.18.8/9 | Ch. 18.8-9 |
| **FEB 9** | **Exam 1** | | **Chapters 16-18** |
| Feb 10 | Buffers | PLA Ch. 19.1 | Ch. 19.1 |
| Feb 12 | Buffer capacity and preparation; Strong acid/strong base titration curve | PLA Ch. 19.2(1) | Ch. 19.1-2 |
| Feb 15 | Weak acid/strong base; weak acid/weak base, polyprotic acids | PLA Ch. 19.2(2) | Ch. 19.2 |
| Feb 17 | Equilibria of slightly soluble ionic compounds, Ksp | PLA Ch. 19.3(1) | Ch. 19.3 |
| Feb 19 | Predicting ppt formation, selective ppt | PLA Ch. 19.3(2) | Ch. 19.3 |
| Feb 22 | Equilibria involving complex ions | PLA Ch. 19.4 | Ch. 19.4 |
| Feb 24 | Transition elements; properties of transition elements and inner elements | PLA Ch. 23.1/2/3 | Ch. 23.1-3 |
| Feb 26 | Coordination compounds, formulas and names | PLA Ch. 23.3 | Ch. 23.3 |
| Mar 1 | Crystal field theory | PLA Ch. 23.4 | Ch. 23.4 |
| Mar 3 | Thermodynamics; 2$^{nd}$ law, entropy | PLA ch 20.1 | Ch 20.1 |
| Mar 5 | Calculating the change in entropy | PLA ch 20.2 | Ch 20.2 |
| Mar 8 | **Recharge Day** | | |
| Mar 10 | **Exam Review** | | |
| Mar 10 | **Exam 2** | | **Chapters 19, 20.1-2, 23** |
| Mar 12 | Entropy, free energy, and work | PLA ch 20.3 | Ch 20.3 |
| Mar 15 | Free energy, equilibrium and reaction directions | PLA ch 20.4 | Ch 20.4 |

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|---|---|---|---|
| Mar 17 | Electrochemistry; balancing redox reactions | PLA ch 21.1 | Ch 21.1 |
| Mar 19 | Voltaic cells, cell construction and operation, notation | PLA ch 21.2 | Ch 21.2 |
| Mar 22 | Voltaic cell potential, E° | PLA ch 21.3 | Ch 21.3 |
| Mar 24 | Nuclear reactions; radioactive decay and nuclear stability | PLA 24.1 | Ch 24.1 |
| Mar 26 | The Kinetics of radioactive decay | PLA 24.2 | Ch. 24.2 |
| Mar 29 | Ionization, application of radioisotopes, | PLA 24.3/4/5 | Ch 24.3-5 |
| Mar 31 | The Interconversion of mass and energy | PLA 24.6 | Ch. 24.6 |
| Apr 2 | Application of fission and fusion | PLA 24.7 | Ch. 24.7 and review |
| Apr 5 | **Exam Review** | | |
| Apr 7 | **Exam 3** | | **Chapters 20.3-4, 21, 24** |
| Apr 10 | Organic chemistry, structure and classes of hydrocarbons, optical isomers | PLA 15.1/2 | Ch 15.1-2 |
| Apr 12 | Organic chemistry, structure and classes of hydrocarbons, optical isomers | | |
| Apr 14 | Some important classes of organic reactions, functional groups | PLA 15.3 | Ch 15.3 |
| Apr 16 | Functional groups | PLA 15.4 | Ch 15.4 |
| Apr 19 | Functional groups | PLA 15.4(2) | Ch 15.4 |
| Apr 21 | Review for final exam | | |
| Apr 24 | **Final Comprehensive Exam** | | Cumulative |

***The topics that will be covered from each chapter will be selective and announced in class.

**Holidays (no classes):** Monday, January 18th (Martin Luther King, Jr. Day). The University suggests Thursday, February 25 and Wednesday, March 24, as Spring Recharge Days for students. The first date has been tentatively rescheduled to March 8th for our class and is dependent on our coverage of course material. The second date will be observed on March 24th and is also dependent on our coverage of course material. These dates will be discussed further in class and will be announced via Canvas.

**LECTURE:** MWF Period 8 (3:00 to 3:50 pm). This course will be delivered face-to-face and online/synchronously.

**MATERIALS:**

1. You are required to have a computer with an internet connection, a functional webcam, and microphone and a handheld mirror (for Honorlock).
2. Tophat subscription for in class clicker questions. *We will be using the Top Hat (www.tophat.com) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. You can visit the Top Hat Overview (https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.An email invitation will be sent to you by email, but if don't receive this email, you can register by simply visiting our course website:*
   https://app.tophat.com/e/791296
   *Note: our Course Join Code is* ***209505***
   *Top Hat may require a paid subscription, at the University of Florida a one semester access is $20.00 and full year access is $30.00. Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.*
3. Non-programmable, non-graphing scientific calculator (TI) or casio, TI-36 does quadratic function which will be helpful in chm2046
4. Silberberg 8th edition recommended (solution manual for end of chapter (EOCs) questions is available in the Marston Science Library)

**DESCRIPTION:** CHM 2046 and CHM 2046L constitute the second semester of the two term sequence of General Chemistry, CHM 2045/2045L - 2046/2046L. 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

**COURSE OBJECTIVES:** As both a general education requirement and major's course, CHM2046 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:

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|---|---|
| 3 Progress Exams | 60% |
| Final Cumulative Exam | 25% |
| PLA/HW | 5% |
| Tophat/Chapter Quizzes | 5% |
| Worksheets (discussion) | 5% |
| TOTAL | 100% |

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

| | | | | |
|---|---|---|---|---|
| 92-100% = A | 84-87.9% = B+ | 72-75.9% = C+ | 64-67.9% = D+ | < 56 = E |
| 88-91.9% = A- | 80-83.9% = B | 68-71.9% = C | 60-63.9% = D | |
| | 76-79.9% = B- | | 56-59.9% = D- | |

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 from Canvas) and submitted to the instructor 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 will be due prior to class. You will have multiple attempts to successfully answer the pre-lecture assignments.

**HOMEWORK (HW):** Approximately two homework assignments will be due per chapter to help you understand the material. The homework will be posted on Canvas under the quizzes tab. You will have multiple attempts to successfully answer the questions. Five percent of the course grade is based on your performance on the PLA/HW. 6 assignments will be dropped at the end of the semester. Additional HW assignments for each chapter can be found under Quizzes, then scroll down to Practice Quizzes. These are not worth any points.

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

**CLICKERS (TOPHAT)/CHAPTER QUIZZES:** Five percent of your grade will come from the chapter quizzes (3.0%) and TopHat (2.0%). You can earn points by correctly answering clicker questions through TopHat. Each class day will be worth three points.

**DISCUSSION CLASSES/ WORKSHEETS:** Five percent of the course grade is based upon your attendance at your discussion class and the correct completion of the worksheet. The Discussion Classes meet weekly and your attendance is expected. If you are more than 5 minutes late, then you forfeit your 2 participation points for the day. If you are not present during the whole discussion period, then you forfeit the remaining 3 attendance point for the day (5 total points). 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. The canvas worksheet will be available Wednesdays from 12 am to 11:59 pm. You will then have until 11:59 pm to complete the worksheet (as a quiz on canvas). Any grade discrepancy needs to be addressed within a week of posting grades to canvas to your 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.

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 will be administered at night from 7:30pm to 10:30pm (Eastern time) via Honorlock. Exam questions will consist of questions similar to the HW/PLA/worksheet/tophat/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).

**Exam Absences:** will be handled in accordance with official UF academic regulations. For more information, see https://catalog.ufl.edu/UGRD/academic-regulations/ . See below for further clarification for two different types of situations.
(1) Conflicts with other events: Acceptable reasons to miss a scheduled exam include conflicting evening exams in courses with higher course numbers, religious holidays, military obligations, special curricular requirements (*e.g.*, attending professional conferences), or participation in official UF-sanctioned activities such as athletic competitions, *etc*. For more information on such absences see the official UF Policy at https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/#absencestext ). If you must be absent for an exam due to a documented and approved conflict known in advance, you must e-mail the documentation at least *one week prior* to the scheduled exam and an **early conflict exam** will be scheduled for you.
(2) Missing an exam due to an emergency or sudden illness: If you are absent for an exam due to an unpredicted documented medical reason or family emergency, you must contact the instructor as soon as possible, and you may be asked to have your excuse verified by the Dean of Students Office (DSO). Your instructor will follow UF academic regulations in evaluating the notification and/or documentation received by you or by the DSO on your behalf. Once your instructor is satisfied with the validity of your exam absence a make-up exam will be scheduled

after a reasonable amount of time, *i.e.*, before the end of the semester. If your documentation is deemed insufficient to excuse your absence you will receive a zero on the missed exam.

**All exam grade disputes must be performed within one week of the scheduled exam date.** 2 points will be deducted from your score if you neglect to sign the Honor Pledge question at the end of every exam.

**Progress Exam "Average/Replace" Policy:** (Applies to all students). No Progress Exam scores will be dropped for any reason. 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 (for example, unapproved exam absence or poor exam performance), the lowest score of the 3 Progress Exams will be replaced by the average score of all 3 of the Progress Exam scores: Example (unapproved absence): Exam 1, 70%; Exam 2, 0%; Exam 3, 90%; The Progress Exam 2 score (0%) will be replaced by {(90+0+90)/3} = 60%. Example (poor exam performance): Exam 1, 70%; Exam 2, 40%; Exam 3, 90%; The progress exam 2 score (40%) will be replaced by {(80+40+90)/3} = 70%

**FINAL EXAM:** The final exam is cumulative (comprehensive) and will contain material from all chapters covered in CHM2046. About 25% from each exam and 25% from the new material not previously covered on an exam.

**CONTACTING THE INSTRUCTOR / OFFICE HOURS:** Emails are for administrative purposes only, and not for distance-instruction. All academic inquiries must be made during 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 chm2046 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 chm2046 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.

**2 points will be deducted from your score if you neglect to sign the Honor Pledge question at the end of every exam. You will receive a 0 for the exam if cheating has been detected and the average/replace protocol will not apply.**

**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 e-mailed to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible.

**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.

**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.

**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/

**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/

**DISCLAIMER:** This syllabus represents 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 in class and on Canvas.