

CHM2046 – GENERAL CHEMISTRY II – SPRING 2022

INSTRUCTOR: Dr. Charles R. Martin, **The Colonel** crmartin@ufl.edu

COURSE DELIVERY: This course will be delivered face-to-face in CLB 130 on Tuesdays Periods 6 and 7 (12:50–2:45 PM) and Thursdays Period 7 (1:55–2:45 PM). There is no virtual option for this course. You must also be registered for a Friday discussion section as per your schedule in ONE.UF.

CANVAS (<http://elearning.ufl.edu>): Here you will find the syllabus, gradebook, files, class announcements, and other pertinent info for the course. Check Canvas often to make sure that you do not miss important announcements, newly uploaded files, etc.

OFFICE HOURS: Face-to-face, Tuesdays, 3:00-4:30, in the Colonel's Office, 218 CLB. Some face-to-face meetings may be switched to a virtual format. If so, an announcement will be made in advance on Canvas. Virtual office hours, Fridays, 2:30-4:00. A link will be sent via Canvas announcement. The same link will be used all semester.

TEACHING ASSISTANTS (TAs): Two teaching assistants are assigned to this class, Juan Sanviel, jsanfiel28@ufl.edu, and Jingzhu Shi, jingzhu.shi@ufl.edu. They will lead the Friday discussion sections and have regularly scheduled office hours in the CLC. Check Canvas for details.

TEXTBOOK: "Chemistry, The Molecular Nature of Matter and Change," Silberberg & Amateis, 8th Edition. Chapters 16, 17, 18, 19, 20 and 21 will be covered. Additional chapters may be added.

DESCRIPTION: CHM2046 and CHM2046L constitute the second semester of the two-term sequence of General Chemistry. Prerequisites and other information can be found in the Undergraduate Catalog.

COURSE OBJECTIVES: The Colonel stresses that everything in CHM2046 goes back to six core scientific concepts that provide the foundation for all of the chemical sciences. Mastering these concepts will help you understand the material and do well in this class. These concepts will also help you understand the world around you and life itself. Finally, as both a general education requirement and major's course, CHM2046 serves to teach the scientific method, skills for problem solving, and general chemistry knowledge.

DURING-SEMESTER EXAMS: There will be three during-semester exams, administered at night from **8:20 to 10:20 PM**. The rooms will be announced on Canvas. The exams are multiple choice and use scantrons. **Exam 1 is Wednesday 2/2. Exam 2 is Wednesday 3/2. Exam 3 is Tuesday 4/5.**

QUIZZES: There will be three during-semester quizzes, taken in your Friday discussion section. The quizzes are hand graded. **Quiz 1 is Friday 1/21. Quiz 2 is Friday 2/18. Quiz 3 is Friday 3/25.**

FINAL EXAM: The final exam is cumulative and takes place **Monday 4/25, 12:30-2:30 PM**. The room will be announced on Canvas.

GRADES: Grading will be based on 900 total earnable points as follows:

During-Semester Exams, 3 x 200 points per exam =	600 points
During-Semester Quizzes, 3 x 50 points per quiz =	150 points
Final Exam =	<u>150 points</u>
Total Earnable Points	900 points

The following non-negotiable grade cutoffs will be used:

92-100% = A	84-87.9% = B+	72-75.9% = C+	60-63.9% = D+	< 50% = E
88-91.9% = A-	80-83.9% = B	68-71.9% = C	56-59.9% = D	
	76-79.9% = B-	64-67.9% = C-	50-55.9% = D-	

CALCULATOR: Calculators must have log, ln, root, exponentiation, and scientific notation functions. Programmable and graphing calculators are not permitted.

DISPUTING A SCORE: You have one week from when a score is posted on Canvas to dispute the score. To dispute, send an email (via canvas or to crmartin@ufl.edu) describing the exam/quiz problem(s) you are disputing. After one week, scores are final.

EXAM/QUIZ CONFLICT/ABSENCE POLICY: If you know in advance that you will be absent for an exam or quiz due to a documented and approved academic, UF athletic, or other approved conflict, email the applicable documentation to me. I must receive this documentation at least one week prior to the scheduled exam/quiz. If this is done, an early conflict exam will be arranged for you. If you fail to send the documentation in this way, your request will be denied.

If you experience a last-minute, unavoidable emergency situation (illness, accident, etc.) that prevents you from attending an exam or quiz, 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. (2) Contact me as soon as you are no longer ill 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.

EXAM AND QUIZ “AVERAGE/REPLACE” POLICY: No exam or quiz 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, the lowest score of the three exams will be replaced by the average score of all three. The same policy applies to the quizzes. Note that an unexcused absence gives a score of zero, which is averaged with the other two scores.

HOMEWORK: There are homework problems at the end of each chapter of your text. The answers to the questions listed with red font can be found in Appendix E. Because the quizzes and exams will have problems like these, you are strongly encouraged to work these problems. Homework will, however, not be collected or graded.

TENTATIVE SCHEDULE: Only main points of discussion are listed below. Other subjects will be discussed. **Adjustments may be made as the semester progresses.**

Jan. 6 – First class

Jan. 6 – 20 – Some of this material is in Chap. 17.

Introductory comments, course objective, and a discussion of the syllabus

Introduction to the six core concepts

The random walk

Introduction to Chap. 17

Jan. 21 – Quiz 1

Jan. 25 – Feb. 1 - Chaps. 16 & 17.

Product-favored reactions

The equilibrium constant, K

A quick review of chemical kinetics (Chap 16)

The reaction quotient, Q

Calculations involving chemical equilibrium

Feb. 2. – Exam 1, Chaps. 16 & 17

Feb. 3 – Feb. 17 – Chaps. 18 & 19

Introduction to acid/base chemistry and pH

Bronsted acids and bases

Strong and weak acids and bases

Acid/base calculations

Conjugate acid/base pairs

Lewis acids and bases

Feb. 18 – Quiz 2

Feb. 22 - Mar. 1 – Chap. 19

Buffers

Buffer calculations

Preparing buffers

Acid/base titrations

Solubility product equilibria

Metal ion complexation

Mar. 2 – Exam 2, **Chaps. 18 & 19**

Mar. 3 – Chap. 20

Introduction to thermodynamics

Mar. 7 - Mar. 11 – Spring Break

Mar. 15 - Mar. 24 – Chaps. 20 & 21
Enthalpy, entropy and Gibbs free energy
Second Law of Thermodynamics
Entropy of the universe
Thermodynamic calculations
Introduction to electrochemistry

Mar. 25 – Quiz 3

Mar. 29 – April 5
Life and electrochemistry
Electrochemical cells
Redox reactions
Nernst Equation
Electrochemical calculations

April 5 – Exam 3 - Chaps. 20 & 21

April 7 – April 19
Electrochemistry, continued
Thermodynamics and electrochemistry
Electrochemical sensors

April 19 – Last Class

April 25 - Final Exam

May 2 – Grades Due

CHEMISTRY LEARNING CENTER (CLC), CCB 105: Free help is available from graduate teaching assistants (TAs) in the CLC. Your discussion TA will have office hours in the CLC. Check the Canvas page for days and times.

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 zero for an exam or quiz if cheating has been detected.**

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 who require such accommodations should get this done as soon as possible.

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

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/>.

STUDY HABITS: Any chemistry course demands a regular sustained effort throughout the semester. CHM2046 requires on average 6 to 8 hours per week of work outside of lecture. You are expected to read the appropriate pages from the textbook prior to coming to class. Reading the material in advance will help you follow the in-class discussion. It is important to point out that mastering this course, or any course, is primarily the student's responsibility. The instructor is a facilitator of the learning process, but the student must put in the hours.

Most importantly, because the later material builds on the earlier material, do not allow yourself to fall behind. 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 homework problems as you can, go to the CLC and your TA's office hours, *etc.*

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