CHM2045 GENERAL CHEMISTRY I

SUMMER 2025; MONDAY/TUESDAY/THURSDAY/FRIDAY (MTRF) PERIOD 3

Sections: 10368-76

INSTRUCTORS: e-mail via canvas (for administrative purposes). Expect a reply within 48 hours or on a Monday after a weekend.

May 12 through June 20	**June 30 through August 8**
Dr. Martina Sumner E-mail (for administrative purposes): m.sumner@chem.ufl.edu	**Dr. Steven Harris** E-mail (for administrative purposes): steven.harris@chem.ufl.edu
Student Hours All student hours will meet in Leigh Hall 308. MTWR: 12:45 – 1:45 pm W 11 to 12 pm F 8:45 to 9:20 AM	**Student Hours** TR: 12:15 pm – 1:30 pm W: 11 am to 1:30 pm R: 9:30 to 10:30 am

INSTRUCTOR INFORMATION

Instructor	Email/Office/Phone	Student Hours
We value your input regarding making this course more accessible and inclusive. Please reach out with suggestions.		**All student hours will meet in 308 Leigh Hall.** We welcome you to contact us outside of class and student hours. You may email us via canvas and/or see us before or after class.
May 12 through June 20 **Dr. Martina Sumner** Associate Instructional Professor	Email in Canvas preferred m.sumner@chem.ufl.edu 352-392-0517 Leigh Hall 404	
June 30 through August 8 **Dr. Steven Harris** Associate Instructional Professor	E-mail (for administrative purposes): steven.harris@chem.ufl.edu	

TEACHING ASSISTANTS

All TA hours: Held in the Chemistry Learning Center (CLC), SFH 105. These student hours will be listed on the Canvas home page.

Academic Resources offers free tutoring assistance. See their website for details.

COURSE DELIVERY/MEETING TIMES

- Face-to-face in CLB130 MTRF
- Discussion section (Wednesday class) in-person
- Exams (DTE – evening assembly exams), 7:00 to 9:00 PM

COURSE FEES

Additional course fees: $1.14

GENERAL INFORMATION

PREREQUISITES

Please refer to the Undergraduate Catalog for placement and prerequisite information.

COURSE DESCRIPTION

CHM 2045 is the first semester of the CHM2045/CHM2045L and CHM2046/CHM2046L sequence. Stoichiometry, atomic and molecular structure, the states of matter, reaction rates and equilibria. A minimum grade of C is required to progress to CHM2046. (P)

This course is designed for students pursuing careers in the sciences or who need a more rigorous presentation of chemical concepts than is offered in an introductory course. Students will engage in problem solving and critical thinking while applying chemical concepts. Topics will include the principles of chemistry including atomic theory, electronic structure, measurement, stoichiometry, bonding, periodicity, thermochemistry, nomenclature, solutions, and the properties of gases.

FIRST DAYS

- Log into canvas and access the course.
- Check daily for announcements and emails
- Helpful tips on study habits and study skills
- How to succeed in the course

REQUIRED & RECOMMENDED COURSE MATERIALS

TEXTBOOK

We will be using the Pearson Learning – Mastering Chemistry online homework system for regular homework this semester. You will be provided an access code for the homework so there is no need to purchase any further access codes.

The Pearson Learning software comes with the ebook, Chemistry: A Molecular Approach, 6e by Nivaldo Tro.

There are two options for purchasing access to the Recommended Text (information below): **Option 1**: consent to have the purchase price charged to your student account following the directions posted on the course homepage in Canvas; this is a time-limited option after which only Option 2 is available. **Option 2**: purchase an access code for the materials at the UF Bookstore (at a slightly higher price).

To opt in, navigate to: https://bsd.ufl.edu/allaccess . Click the “Opt In” tab or view the “View Eligible UF All Access Classes” button. You will be prompted to log in using Gatorlink credentials. Follow the prompt to authorize charges to your student account. The access code will then be provided. Copy the access code to your clipboard. In the Canvas course, click on the Mastering module, and provide the access code when prompted to do so. If you have any questions about the authorization process or refunds contact Included@bsd.ufl.edu.

All other assigned material will be available through Canvas.

Optional: Students can also acquire an older version of Silberberg (6^{th}, 7^{th}, 8^{th}, 9^{th}).

Note: A free OER (Open Educational Resources, OpenStax) chemistry book is available in pdf form on the canvas page (Chemistry 2e).

All other assigned material will be available through Canvas.

CALCULATOR (REQUIRED, MUST PURCHASE)

- Required: TI-36 is a good calculator, has quadratic functions and is most like TI-83 (TI-83 or 84, and programmable calculators, are not allowed), as you’ll need one with logarithmic functions.

GENERAL EDUCATION OBJECTIVES AND LEARNING OUTCOMES

Primary General Education Designation: Physical Sciences (P) (area objectives available here)

A minimum grade of C is required for general education credit. Courses intended to satisfy the general education requirement cannot be taken S/U.

Physical science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the physical sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern physical systems. Students will formulate empirically-testable hypotheses derived from the study of physical processes, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

Some of the specific skills I hope you will obtain in this course are listed below:

Content: *Students demonstrate competence in the terminology, concepts, theories and methodologies used within the discipline*. Students will acquire a basic knowledge of a variety of chemistry concepts including the scientific method, stoichiometry, reaction types, thermodynamics, solutions, solids, gases, and chemical bonding. Achievement of this

learning outcome will be assessed largely through assigned homework problems, and quizzes and exams.

Communication: *Students communicate knowledge, ideas, and reasoning clearly and effectively in written and oral forms appropriate to the discipline*. Students participate in class discussions throughout the semester to reflect on pertinent topics. Achievement of this learning outcome is realized through discussion sessions and/or office hours during which students formulate questions, construct arguments, and use logical reasoning to draw reasonable conclusions.

Critical Thinking: *Students analyze information carefully and logically from multiple perspectives, using discipline-specific methods, and develop reasoned solutions to problems.* Students apply mathematical knowledge and reasoning to solve chemical problems. This may entail use of algebra, basic geometry, and graphical analysis. Achievement of this learning outcome is largely assessed via worksheets, assigned homework problems, and quizzes and exams.

COURSE LEARNING OUTCOMES

A complete list of student learning outcomes is posted in Canvas, organized by module/chapter.

- Students will apply the law of conservation of matter and energy.
- Students will implement rules of significant numbers to all measurements.
- Students will explain the fundamental properties of matter including but not limited to atomic and electronic structure, and periodicity.
- Students will apply IUPAC rules of nomenclature.
- Students will predict molecular geometry and properties from bonding theories.
- Students will predict and explain the products of chemical reactions (e.g. acid-base, oxidation-reduction, precipitation, dissociation).

COURSE COMMUNICATIONS

GENERAL QUESTIONS

General course questions should be posed to your instructor during student hours, or to TAs during their student hours or during discussion sessions.

PRIVATE OR GRADE-RELATED QUESTIONS

Direct these to your instructor via the mail function in Canvas. Do not email outside of Canvas to your instructor's external email address – we aren't permitted to discuss grade related questions outside of Canvas. You will be asked to resend the query through Canvas.

Instructor response time to email queries is <48 h during the workweek, or the first business day for emails received Friday or over the weekend.

COURSE POLICIES

ASSIGNMENT DUE DATES

All due dates for assignments are clearly posted in the course assignments of the Canvas page and reflect the most up-to-date information. Unfortunately, life happens, and you may need extra time to complete an assignment. Let me know so we can come up with a solution. To get the most out of these assignments they need to be completed on time to keep your learning material on track

PRE-LECTURE VIDEO (PLV)

- PLVs prepare you for that day's class (may be helpful to read the appropriate pages in a chemistry book first 10-30 pages per lecture depending on material – see daily schedule)
- Time to completion: 1 to 2 hours
- 3 attempts, highest one will count
- Due before class so you are ready for class.
- 3 of the PLVs will be dropped before calculating your overall grade

DISCUSSION SESSIONS & WORKSHEETS

- Wednesday discussion class
- Paper version available under Modules, suggestion: do before attending your Wednesday class
- Time to completion: 0.5 to 2 hours (does not include attendance at Wednesday class)
- Attendance and participation will earn you 5 points
- Wednesday worksheet quiz on canvas will earn you 5 points (3 attempts)
- Grade discrepancies: address to your grad TA within one week
- 1 assignment will be dropped from this category

Worksheets problems are similar to exam problems and prepare you for the actual exam.

ACHIEVE

- HW assignments are due once per chapter
- Time to completion: 0.5 to 1 hour
- Multiple attempts
- 1 assignment dropped in this category

ICLICKER

- Keeps you engaged and active in the classroom
- Time to completion: none (in class participation)
- 3 days (about 9 points) are dropped before calculating your final iclicker grade

CANVAS QUIZZES

- Most difficult of the assignments
- Time to completion: 1 hour
- Prepares you for actual exam in a low stake, yet similar, environment as an Exam (timed and 1 attempt)
- Weekly quiz (available for 48 hours), due Friday, available Thursday
- One timed attempt

EXAMS

- Exams are at night (7-9 PM) (During Term Exams)
- Exam dates in the schedule (at the end of the syllabus)
- Scantrons, formula sheet, and blank scratch paper are provided
- Bring pencils and eraser
- Use a non-graphing, non-programmable scientific calculator
- Turn your cell phones and other electronic devices off and keep in your bag.

PROGRESS EXAM "AVERAGE/REPLACE" POLICY

- Applies to all students.
- No dropped progress exam.
- Average/replace policy (lowest of the 3 progress exams replaced by the average of the 3 progress exams.

For example, if a student scores the following on their three progress exams: 0%, 65%, 80%, the 0% would be replaced with the average of 0, 65 and 80, which is 48%. That is a much better score than a 0.

- 30 points deducted if you bubble in the incorrect or no form code
- 5 points deducted if you are in the incorrect room or your name is on the no-match list from the scanning center

OPTIONAL CANVAS HOMEWORK

- Several optional homework assignments are available for each chapter to help you understand the material. The homework is posted in Canvas. You have multiple attempts to successfully answer the questions. These are not worth any points.
- You should also work on numerous End-of-Chapter questions (EOCs).

POSTED GRADE DISPUTES

- In writing via email to instructor
- Within one week of posting grade

ATTENDANCE, EXTENSION REQUESTS

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/UGRD/academic-regulations/attendance-policies/

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 may include 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 your instructor (within Canvas) 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 from you or from 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.

WORKLOAD

- UF is a Carnegie I research-intensive university.
- Federal law requires UF to assign at least 2 hours of work per week outside of class for every contact hour (3 contact hour for chm2045 = minimum of 6 hours per week)

GRADING

GRADE POLICY

- Grades are not rounded at the end of the semester.
- No extra credit available.
- A minimum grade of C is required for general education credit. Courses intended to satisfy the general education requirement cannot be taken S/U.
- Current UF grading policies for assigning grade points can be found in the catalog.

Assignments weights are as follows:

Assignment Group	Weight %
Progress Exams	60%
Final Cumulative Exam	20%
Quizzes	5%
Homework	4%
IClicker	1%
Pre-Lecture Video (videos-playposit)	6%
Discussion/Worksheets	4%
TOTAL	100%

Grade scale (note: there is no rounding to your score in Canvas):

Letter	A	A-	B+	B	B-	C+	C	D+	D	D-	E
Cutoff	90.0	86.0	83.0	80.0	77.0	73.0	69.0	66.0	63.0	60.0	< 60.0

UNIVERSITY POLICIES

STUDENTS REQUIRING ACCOMMODATIONS

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting https://disability.ufl.edu/get-started/. It is important for students to share their accommodation

letter with their instructor and discuss their access needs, as early as possible in the semester.

Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

HONOR CODE

University of Florida students are bound by the Honor Pledge. On all work submitted for credit by a student, the following pledge is required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Student Honor Code and Conduct Code (Regulation 4.040) specifies a number of behaviors that are in violation of this code, as well as the process for reported allegations and sanctions that may be implemented. All potential violations of the code will be reported to Student Conduct and Conflict Resolution. If a student is found responsible for an Honor Code violation in this course, the instructor will enter a Grade Adjustment sanction which may be up to or including failure of the course.

IN-CLASS RECORDING

- Class is recorded and is available for viewing via MediaSite (link is on the bottom of the home page)

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor. A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session. Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action

instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

CAMPUS RESOURCES

1. U MATTER, WE CARE: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
2. COUNSELING AND WELLNESS CENTER: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.
3. STUDENT HEALTH CARE CENTER: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
4. UNIVERSITY POLICE DEPARTMENT: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
5. UF HEALTH SHANDS EMERGENCY ROOM / TRAUMA CENTER: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.
6. GATORWELL HEALTH PROMOTION SERVICES: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

ACADEMIC RESOURCES

1. E-LEARNING TECHNICAL SUPPORT: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
2. CAREER CONNECTIONS CENTER: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
3. LIBRARY SUPPORT: Various ways to receive assistance with respect to using the libraries or finding resources.
4. ACADEMIC RESOURCES CENTER: Broward Hall, 352-392-2010, or to make an appointment, 352-392-6420. General study skills and tutoring.
5. WRITING STUDIO: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.
6. STUDENT COMPLAINTS ON-CAMPUS: Visit the Student Honor Code and Student Conduct Code webpage for more information.

FEEDBACK

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 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/.

GETTING HELP

For issues with or technical difficulties with Canvas, contact the UF Help Desk: https://it.ufl.edu/helpdesk/; (352)-392-HELP.

DISCLAIMER

This syllabus represents our current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected.

DAILY COURSE SCHEDULE: THE LECTURE SCHEDULE IS TENTATIVE, BUT EXAM DATES WILL NOT CHANGE

PLV: 1-2 hours/video (includes reading a textbook); weekly quiz: 1 hour; weekly; HW: 1.5-3 hours/week; wksheet quiz: 30 minutes

Page numbers for books are approximate.

Class date	**Topic and chapters**	**Quiz/wksheet/ Discussions Quiz = 1 hour**	**PLVideo Time for assignment: 60 to 90 minutes/ video**	**ACHIEVE HW Ebook page #s**	**OER pdf page #s**
Mon 5/12	Introduction & Review		Intro day 1 (30 min)	2-58	14-47
T 5/13	Dimensional analysis, naming		Intro day 2 (43 min)	72-97	71-103
Wed 5/14	Discussion about introductory material	Worksheet 1, Wksheet quiz			
R 5/15	The mole, molecular and empirical formulas		Combustion analysis (42 min)	108-117	118-136, 195-96
Fri 5/16	Reactions and stoichiometry	Quiz about intro and combustion, stoich	Stoichiometry (31 min)	117-148	160-165, 180-195
Mon 5/19	Solution concentration, M, dilutions		Molarity and net ionic (33 min)	164-169	136-143, 166-180,
T 5/20	Net ionic equations and precipitation reactions		Precipitation rxn (7 min)	169-178	166-69
Wed 5/21	Discussion over stoichiometry and net ionic	Wksheet quiz			Ch 1, 2
R 5/22	Acid-base reactions	on A/B, redox, ppt	Acid/base reaction (42 min)	178-195	170-74
Fri 5/23	Redox reactions and reversibility	Quiz A/B, redox, ppt	Redox (42 min)	186-195	174-178
Mon 5/26	**HOLIDAY**				
T 5/27	Review				

Wed 5/28	Discussion over solutions, acid/base etc	Wksheet quiz			
R 5/29	Overview of gases, P, gas laws		Gases day 1 (33 min)	206-211	416-434
F 5/30	Rearrangement of ideal gas law		Gases day 2 (36 min)	211-225	434-448
	Exam 1 (Ch. 1-4)				

For exam 2 chapters 5-8					
Mon 6/2	KMT and real gases		Gases day 3 (33 min)	225-233	448-461
Tues 6/3	Forms of energy, enthalpy		Thermochemistry day 1 (19 min)	246-251	211-220
Wed 6/4	Discussion on gases	Wksheet quiz gases			
R 6/5	Calorimetry: Constant P, constant V		Thermochemistry day 2 (26 min)	251-259	221-232
Fri 2/6	Stoichiometry of thermochemical rxn, Hess's Law, ΔH of formation	Quiz on gases	Thermochemistry day 3 (31 min)	259-274, 284-296	233-246, 259-274
Mon 6/9	Nature of light		Energy and light (29 min)		Ch. 6
T 6/10	Quantum mechanical model of atom		Quantum numbers (35 min)	296-318	274-286
W 6/11	Discussion over thermochemistry	Wksheet quiz			
R 6/12	Electron configuration and quantum mechanical model	Quiz on thermo	Electron config (24 min)	331-344	287-295
Fri 6/13	Trends in atomic properties		Periodic trends (43 min)	344-361	295-303
Mon 6/16	review				

T 6/17					
W 6/18	Discussion over periodic trends	Wksheet quiz			
R 6/19	**Holiday**				
Fri 6/20					
	Summer Break June 23-27				

After summer break (start with ch 9?)					
Mon 6/30	Ionic bonding model	Quiz light and trends	Chemical bonding day 1 (25 min)	374-385	313-322, 340-343
Tues 7/1	Covalent bonding model and bond energy		Chemical bonding day 2 (23 min)	385-392	336-340
Wed 7/2	discussion				
R 7/3	Electronegativity and bond polarity		Chemical bonding day 3 (13 min)	389-392	354-357
Fri 7/4	**Holiday**				
Mon 7/7	Lewis structures, resonance, formal charge		VSEPR day 1 (40 min)	402-410	322-336
Tues 7/8	VSEPR		VSEPR day 2 (26 min)	410-422	343-354
Wed 7/9	discussion				
R 7/10	Molecular shape and polarity		VSEPR day 3 (26 min)	422-429	343, Ch 10
Fri 7/11	Valence bond theory, modes of orbital overlap, sigma and pi bonds		VB and MO day 1 (33 min)	440-452	376-393
Mon 7/14	Molecular orbital theory (MO)		VB and MO day 2 (51 min)	452-469	393-407

Tues 7/15	Intermolecular forces		IMF (41 min)	480-492	487-510
Wed 7/16	Discussion over VSEPR	Quiz VSEPR Wksheet quiz			
R 7/17	Physical states; phase changes, heating curve calculations (ch 12)		Heating curve/phase diagrams (60 min)	492-503	476-487
Fri 7/18	The solid state: structure, properties, and bonding	Wksheet	Cubic unit cells (27 min)	503-517	510-533
	Exam 3 ch 9-11				
Mon 7/21	Types of solutions; intermolecular forces	Quiz VB	Solutions (30 min)	530-543	548-556
Tues 7/22	Why dissolve, Solubility as an equilibrium process		Colligative prop (43 min)	543-550	555-563
Wed 7/23	Discussion over VB and MO				
R 7/24					
	Discussion IMF and solids	Wksheet quiz			

Fri 7/25	Colligative properties, structure and properties of colloids		Van't Hoff and electrolytes (32 min)	550-554	564-591
Mon 7/28	Chemical kinetics, reaction rate, rate law and components		Chemical Kinetics day 1 (45 min)	566-577	600-614
Tues 7/29	Discussion colligative prop				
Wed 7/30	Integrated rate laws	Wksheet quiz	Chemical Kinetics day 2 (28 min)	577-584	614-625
R 7/31					

Fri 8/1	Chem kinetics theories, catalysis, reaction mechanisms	Quiz collig prop	Chemical Kinetics day 3 (44 min)	584-595	625-641
Mon 8/4	review				
Tues 8/5	Discussion chem kinetics				
Wed 8/6	review	Wksheet quiz, opt Quiz			
R 8/7					
Fri 8/8					

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

Holidays (no classes): Monday, May 26; Thursday, June 19; Summer Break week of June 23-27; Friday, July 4