

CHM2047 — ONE-SEMESTER GENERAL CHEMISTRY

Designed for entering (not transfer) students who wish to move more quickly into advanced coursework. This is not a review course for Gen Chem. Electronic structure and bonding, gases, liquids, solids, kinetics, equilibria, acids and bases, thermodynamics, oxidation-reduction, metals and non-metals.

Prerequisites: AP, IB, AICE, or dual enrollment chemistry courses with credit for CHM2045/L; Coreq: CHM 2047L.

Instructor: Professor Valeria Kleiman (she/her). Office 311B CLB (Chemistry Laboratory Building), e-mail: All written communication has to be done through the CANVAS inbox.

Teaching Assistants: Five "peer mentors" are responsible for the Wednesday discussion sessions. They are students who successfully completed CHM2047 last year. Not only did they come out in the top of their class, they were recommended for this position by their peers. Having taken the class so recently, they are very attuned with the fast pace and demands of this course.

Alex Harrison harrisona@ufl.edu, Bret Ellenbogen bret.ellenbogen@ufl.edu,
Dhairya D Shah shahdhairya@ufl.edu, Michelle S. Patel michelle.patel@ufl.edu,
Victor Suarez victor.suarez@ufl.edu

The 2 graduate students are responsible for grading and for office hours. They are working towards their PhD in Physical Chemistry, with experience teaching and a desire to help facilitate the course.

Scarlett Godinez scarlettaren@ufl.edu Namodhi wijerathne wijerathne.h@ufl.edu

Textbook: "Principles of Modern Chemistry" 8th Ed., by Oxtoby, Gillis & Butler.
Cengage Learning, ISBN 1305079116 on Course Reserve @ Martson Science Library

"LearningCatalytics (LC)" You will need to purchase access and create a student account on learningcatalytics.com (see instructions below)

Class Schedule: Fall 2019. August 20 - December 4 (No class on November 27-28)

Period	time	TUESDAY (Lecture)	room	WEDNESDAY (Discussion)	room	THURSDAY (Lecture)	room
02	8:30 - 9:20			8023 Suarez	LEI 142		
03	9:35 - 10:25	Kleiman	JHH221	8020 Patel	LIT 223	Kleiman	JHH221
04	10:40 - 11:30			8007 Shah	CDB 224		
05	11:45 - 12:35			5636 Harrison	MAT 108		
06	2:50 - 1:40			8010 Ellenbogen	Lei 142		

Office Hours:

Prof. Kleiman and all TAs are available to help students in any of the five sections. You are not limited to only the TA assigned to your section.

Tentative Exam Schedule: Monday Sept 23th (Ch. 1-6), Monday October 28th (Ch. 6-9, 12-13), Tuesday Dec 3th (Ch. 10-11, 14-19) time and place will be announced.

Period time

* Chemistry Learning Center 2nd Floor JHH room #203
& CLB 313 # Lei 328

		MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
02	8:30 -9:20					
03	9:35- 10:25	*Patel				Wijerathne
04	10:40 - 11:30					
05	11:45 - 12:35	*Harrison	*Suarez		*Ellenbogen	*Shah
06	12:50 - 1:40		*Harrison		*Suarez	Wijerathne
07	1:55 -2:45	*Patel	#Godinez			
08	3:00 - 3:50			Wijerathne		*Ellenbogen
09	4:05- 4:55	#Godinez	&VDK	Wijerathne	&VDK	
10	5:10- 6:00					
		*Shah				

Grades

Grades are based on your own performance, independent of your classmate's work. The final grade is an evaluation of how much you've learned and achieved in regards to the course goals. The course grade is a combination of your effort and achievements in several activities and the grading scheme corresponds to the final letter grade in the class

Activity	contribution to grade
3 in-term exams	45% (15% each)
3-quizzes	12 % (4% each)
HW	25 %
WebMO	3%
Participation	15%

Please note that a 'C-' is not considered a passing grade for majors requiring a General Chemistry course. See <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx> for more info on UF grade policies.

Goals and Objectives

Overview and Goals:

CHM2047/2047L is a one-semester General Chemistry program for entering students with strong backgrounds in chemistry, normally reflected by high AP, IB, or AICE chemistry test scores and/or incoming DE credit for General Chemistry. This program allows students to move more quickly into advanced work. The goals of the course are to give an overview of basic chemistry in one semester and to prepare the students for subsequent work in organic, analytical, and physical chemistry.

General Chemistry Learning Objectives:

The course will provide instruction in the basic concepts, theories, and fundamental terms of chemistry. At the very core of chemistry is the concept of the atom, its structure, and bonding interactions with other atoms. The course therefore takes an 'atoms-first' approach in order to lay a conceptual foundation for the many aspects of 'macroscopic' chemistry. Approximately one third of the course is devoted to atomic and molecular structure and bonding. In later parts of the course the manifold connections between the atomic/molecular structure of compounds and their behavior in chemical reactions under laboratory conditions will be emphasized. This allows the student to comprehend and predict the behavior of chemical systems rather than to memorize a potpourri of diverse facts. Major scientific developments will be reviewed and their impacts on society, science, and the environment examined. Focus will be placed on the relevant processes that govern biological and physical systems. With what they learn students will be able to: (1) formulate empirically testable hypotheses relevant to the study of physical and life processes, (2) use logical reasoning skills through scientific criticism and argument, and (3) apply techniques of discovery and critical thinking to predict and evaluate outcomes of experiments. Upon successful completion of CHM2047 each student will:

- have a working knowledge of the basic concepts, theories, and fundamental terms of Chemistry, and understand the relevant processes that govern chemical systems,
- grasp the major scientific developments that have led to the current state-of-the-art in the field,
- be able to assess impacts Chemistry has on society, science, and the environment,
- be familiar with and capable of using the scientific method when discussing scientific facts as they relate to Chemistry,
- know how to formulate empirically testable hypotheses derived from the study of physical and chemical processes,
- use logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to predict and evaluate outcomes of experiments.

To achieve these objectives students are required to participate in all class activities:



Regular attendance of lectures in which chemistry will be discussed and demonstrated. Lecture attendance requires active participation on the students' part. Large sections of class time will be spent in scientific dialog between teacher and students where we will practice the art of scientific reasoning.



One period of small group discussions is held each week in which students discuss and apply the concepts learned in class under the guidance of a teaching assistant. The discussion sessions focus on homework problems and further explore difficult concepts that need additional explanation beyond the lectures. Students are expected to participate actively. They will work out homework problems on the board and participate in the discussion. This will not only give students helpful feedback on their own work but also train their logical reasoning skills through scientific criticism and argument.



Weekly graded homework assignments which include conceptual and numerical problems that require the student to apply the learned concepts to specific examples. Some of these problems will be worked out using the WebMO interface on the departmental web page or other online resources. Problems are taken from different areas of experimental and theoretical chemistry including physical and life processes. Homework problems may also include reading material, typically a topically related original research article requiring the student to summarize and comment on in their own words.



Quizzes and exams will be administered throughout the semester. Due to time constraints exams are not as detailed and time-intensive as homework problems. Emphasis is placed on testing the students' reasoning skills and their understanding of the material rather than rote memorization of facts. On their exams, students will receive all pertinent equations. Quizzes are meant to help you study. They will be administered days before each exam to guide the student through the material included in the exam.



Active participation in the class discussion, and through working out problems on the board.



Participation in one or more of the 20! weekly office hours offered by the instructor and TAs, conveniently spread out over the whole week. Students are strongly encouraged to seek help and feedback on all concepts and problems encountered in class. While office hour attendance is voluntary, it is an important activity that will help solidify students' understanding of the material and make them successful in the course.

How to Succeed in CHM2047?

The material covered in CHM2047 is based on the textbook. Reading the assigned pages BEFORE class time will allow you to follow the lecture, understand the topic and ask questions about confusing concepts. The instructor will build on the textbook reading material and you are expected to be able to follow in-class discussion. The course demands a regular sustained effort throughout the semester. Learning chemistry is an incremental process, if you missed a concept it becomes harder to understand the next one. If you find that you are not grasping essential material by reading the textbook and following in-class discussion, **seek help!** The teaching-team goals are to facilitate your learning process, to provide you with tools so you become an independent learner. Take advantage of all available opportunities: **visit your instructor's and/or TA's office hours**, talk to other students in your class, compare notes, form a study group, consult other text books, go to the CLC (Chemistry Learning Center), *etc.* It is highly encouraged to form study groups and meet with them on a weekly basis to discuss course material and to prepare for exams. Good learning habits are *learned* and once part of your life, they'll be useful in all your college courses.

It is highly encouraged to form **study groups** and meet with them on a weekly basis to discuss course material and to prepare for exams. In this course it is permissible that you work on Homework assignments together with your study partners. However, *you are responsible to fully understand your own worked-out HW submissions and may not just copy someone else's.*

Class Attendance

Attendance to lectures, discussions and office hours is expected. In many instances (and as time allows), the 2-period class will combine a traditional lecture with discussion of problems. Reading the material BEFORE lecture time is paramount to keep up with the fast pace of the course. In addition to the 4 hrs class a week, ~10/week of reading, homework and general study are required. Repeated absence in class and discussion session will make it very difficult to earn full participation points, but more importantly, the one-semester Gen Chem course has a fast pace making it imperative to stay on task, otherwise it becomes very hard to catch up on the missed material. For further information on UF's attendance policies which are in effect for this course, see: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx> .

Math Requirements

Students are expected to have a solid grasp of pre-calculus algebra and trigonometry, and should either be co-registered for MAC2311 (Calculus 1) or have credit for it. During lectures, concepts from Calculus may be discussed but will not appear on exams. When derivatives or integrals are mentioned the focus is primarily on

their graphical interpretation to aid understanding of chemical or physical concepts. When homework problems require their use, feel free to employ computational solvers such as Wolfram Alpha: <http://www.wolframalpha.com/>. Learning how to make graphs and how to read them is a fundamental component of your scientific education. Graphs will be employed throughout the course and students are expected to create, modify and work with plotting tools.

Exam Policies

Three in-term exams will be given (see schedule for details). These exams will be held in the evening. This schedule has the purpose to allow some flexibility in their duration (approximately 2 hours).

Making up a missed exam is a serious and exceptionally burdensome problem. Consequently, a makeup exam will require that you have a legitimate excuse, and that you have brought this to the attention of the instructor at least 48 hrs. before the missed exam. Legitimate excuses include sickness or conflicts with regularly scheduled classes or another exam for a higher numbered class or an assembly exam. If you are not sure whether your excuse is valid, talk to the instructor before missing an exam. If you have an emergency that prevents you from letting the instructor know ahead of time, an excused absence and rescheduled make-up exam will be granted after official documentation about your emergency (doctor's notes, *etc.*) deemed appropriate by your instructor has been presented.

Final exam: The final exam is optional. If a student is happy with her/his/their grade at the end of the semester she/he/they may skip the final exam. The instructor reserves the right to consider assigning a letter grade above that which the student would receive based strictly on total points earned. This will only take effect if the final exam is taken and the performance on the final exam is significantly above the student's overall performance for the semester, and if the student shows clear improvement in her/his/their exam grades over the course of the semester.

A student contending that an exam or quiz has been miss-graded or miss-scored must report this to the TA responsible for grading within one week of receiving the original grade or score. Failure to follow this policy results in no reconsideration of the contended grade or score. For all questions on grades or grading, please consult with the cognizant TA first **in person**. If this does not resolve the issue you may talk to the instructor about it.

On-line Quizzes

There will be 3 on-line quizzes. They will be given through the canvas interface to the class. Quiz duration is generally 60 minutes. The clock starts running when you start the quiz. Quizzes may be taken twice with the best result counting toward your grade. Quiz answers must be your own, not shared with other students.

Required Course Tools

Textbook

The listed textbook is only one of many reference and study tools you should use to learn Chemistry. "Oxtoby, Gillis, Butler, Principles of Modern Chemistry" was chosen because of its combination of scientific rigor and accessibility. There is a copy on course reserve at the Marston Science Library. There is no need to bring the textbook to class. Occasionally, problems from the book will be used for homework, quiz, or exam problems. Posted reading assignments ought to be completed before coming to class to allow for better comprehension of

the material during lecture. If you use an older edition of the textbook or a different General Chemistry text you are responsible for finding the page numbers of the reading assignments on your own.

LearningCatalytics (LC)

In this course, we will use LC for your digital device to respond to the instructor's questions and earn valuable points toward your grade. You will need to purchase access and create a student account on <https://learningcatalytics.com/>. Follow instructions on that web site, or in the registration document on your Canvas account (click on Files → LC → Get_Started- _Flyer_Learning_Catalytics.pdf) to activate your account and link it to our course, CHM2047. When registering make sure to use your full first and last name with correct spelling including capitalization. This is important to correctly link your LC gradebook entry to your course grades on Canvas. Do not register twice! If you have trouble logging in, get in touch with Pearson's help desk online at <https://support.pearson.com/getsupport/s/?tabset-dd12d=1>. The cost for LC is \$12 for the semester. You are required to bring at least one wifi-enabled digital device to class to use for this activity. If you don't have access to a digital device, please contact the instructor.

CANVAS

Access your Canvas e-learning account by clicking on the 'Log-In to E-Learning' link on the web site, <http://lss.at.ufl.edu/> where you will have to supply your Gatorlink credentials to log in. Please, do this at your earliest convenience and make yourself familiar. Canvas will be primarily used by TAs and the instructor to communicate with the class. Please make sure to monitor the announcements on a regular basis. There may occasionally be assignments on Canvas that need to be completed before class. If you experience technical problems when using Canvas, *e.g.*, during an online quiz, please contact the UFIT helpdesk (<http://helpdesk.ufl.edu/>, 352-392-4357 M-F from 8:00am till 5:00pm, email helpdesk@ufl.edu, or go to: <http://helpdesk.ufl.edu/e-learning-support/>).

Calculators

You must have your own scientific calculator. Calculators may be used on quizzes and exams but may not be shared. You may **not** use graphing calculators or any calculators that are capable of communication on any exam. Simple inexpensive scientific calculators such as the TI-30 series or the Casio fx-260 are acceptable and sufficient for any problem encountered on exams.

Plotting

Learning how to make graphs and how to read them is a fundamental component of your scientific education. Graphing must be done professionally and formatted in a way that another user can read the information and understand it. There are a large variety of graphing packages available to use at UF ([UF APPS](#)) or online. Examples are: **SigmaPlot** (UF Apps), **IPython** (UF Apps, Jupyter notebooks are the coolest thing on earth!) **Matlab** (free in UF comp. labs and as an App) Origin, Igor, GRACE (free), gnuplot (free), magicplot, excel or any other software of your choice. You will need time to learn to use it, so plan ahead. You must be able to have full control of axis, symbols, lines, and colors, be able to do linear fittings, learn to plot multiple dataset on the same graph, multiple graphs printed in a single page, etc. If you need help, the instructors are here to help.

WebMO

WebMO is an App that allows easy access Quantum chemistry computational work. A WebMO account has been assigned to each student registered in this course. Instructions on how to access your WebMO account are listed in the CANVAS site.

Assignments

Homework Problems

They are (10-12) HW, assigned weekly. They will normally be published on Canvas by Thursday and due on the following Wednesday at 8 am. Late HW policy: HW is late if it is not delivered at the beginning of the lecture session. Each day late will incur a 20% deduction of the total points value. Do your HW! By doing HW problems you will be better prepared to deal with problems on exams. Be ready to work out HW problems on the board during discussion sessions.

It is always better to turn in an incomplete HW than not turning ny HW at all!

Submission of HW: HW are submitted ONLINE as a single pdf file. A high quality picture of your HW can be used to create the compiled pfd file. You can use free apps (like CamScanner) or go to the Martson Library, where scanners are available for free. Give yourself some extra time to go through the pdf creation and submission procedure. Multiple file or unreadable submissions will be returned to the student ungraded.

HW problems come from multiple sources, including the instructor's own personal list of problems. Since these will be the hardest problems you will encounter in CHM2047, you may form study groups with other students to work on them. **However, simply copying someone else's work is plagiarism and will be treated as such! Sometimes you will find the solutions to the HW online. Copying these solutions without your own intellectual contribution will not only remove points from your grade (plagiarism) but will be detrimental to your understanding of the material and preparation for the exams.**

WebMO

WebMO is an App that allows easy access Quantum chemistry computational work. Assigned weekly, these exercises will contain at least one problem for which you will use the web applet 'webmo.' Typically, these assignments involve generating a molecule using a molecular editor followed by specific quantum chemical or modeling calculations to obtain a desired result. The WebMO HW questions will have clearly spelled protocols you will need to follow in order to obtain a useful result. The goal of using WebMO is to become comfortable with modern computational chemical software which allows you to predict molecular properties. The CANVAS site has the registration and login instruction.

Participation

Learning is more effective as a group activity. You can study on your own, but participation in class "conversations", solving problems on the board and asking questions are all fundamental components of the learning experience. Whatever question or doubt you might have, it is very likely (certain) another student has the same doubt or struggles with the same concept. It is important then to share that part of the learning process. Participation grade will be earned through active participation during the lectures, participation in the small group discussion sessions and answering the *Learning Catalytics* question posed during lecture time.

Wednesday Discussion Sessions:

During the discussion session you will earn participation points for solving HW problems on the board. You are expected to work out **at least 5 (five) different HW problems throughout the semester** to receive participation grade from discussion sessions. Points are also earned from active participation in the discussion sessions which includes asking questions, describing how you approached a HW problem, and overall interacting with your peers during the discussion session. Your TA will keep track of your in-class participation.

Tuesday and Thursday Lectures: Active participation during the lectures includes paying attention, asking questions, answering questions posed by the instructor and using the *Learning Catalytics* application to provide active feedback in class. (see CANVAS site for registration and login instructions)

Additional Information

Online Course Evaluation

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/>.

Students with Disabilities

Students requiring special accommodations should register with the Dean of Students Office (<http://www.dso.ufl.edu/>, 352-392-1261) and the Disability Resource Center (DRC, <https://www.dso.ufl.edu/drc>, 352-392-8565, email: accessUF@dso.ufl.edu), and present documentation from that office to the instructor.

Counseling Services

The University of Florida provides counseling services for students, staff, and faculty. See <http://www.counseling.ufl.edu/cwc/>. If you or a friend are in distress, call (352) 392-1575 (available 24/7), email umatter@ufl.edu, or walk in for an emergency consultation during regular service hours (8:00am – 5:00pm) at the Radio Road Site, 3190 Radio Rd., or the Peabody Hall Site, on the 4th floor of Peabody Hall, adjacent to Criser Hall. For other hours or weekends, call the Alachua County Crisis Center, (352) 264-6789. For sexual assault recovery services call the Student Health Care Center at (352) 392-1161. For life-threatening emergencies always call 911.

Emergency Numbers and Web Sites

UFPD (UF Police Department): In case of emergency dial 911. The UF campus police non-emergency number is (352) 392-1111. Their web site: <http://www.police.ufl.edu/>,

UF Emergency management: (352) 273-2100. <https://emergency.ufl.edu/>,

Infirmery (student health center): (352) 392-1161, <http://shcc.ufl.edu/>.

EH&S (Environmental Health & Safety): (352) 392-1591, <http://www.ehs.ufl.edu/>.

Other Academic Resources

UF provides several other resources for students, such as

Library Support can be obtained here: <http://cms.uflib.ufl.edu/ask>, where you can find various ways to receive assistance with respect to using the libraries or finding resources.

The Career Resource Center is located on level One in the Reitz Union, (352) 392-1601, and provides career assistance and counseling. Refer to <http://www.crc.ufl.edu/> for further info.

The Teaching Center is located in Broward Hall, main phone (352) 392-2010 or appointment phone (352) 392-6420, and provides students with tutoring services and counseling regarding general study skills. Refer to <http://teachingcenter.ufl.edu/> for further info. It may also provide employment opportunities as tutors for well qualified students.

The Writing Studio is located at 302, Tigert Hall, (352) 846-1138, and provides help with brainstorming, formatting, and writing papers, see: <https://writing.ufl.edu/writing-studio/>.

The Ombuds Office is located at 31 Tigert Hall, (352) 392-1308, and provides students assistance in resolving problems and conflicts that arise in the course of interacting with the University of Florida. By considering problems in an unbiased way, the Ombuds works to achieve a fair resolution and works to protect the rights of all parties

involved. For further information go to <http://www.ombuds.ufl.edu/> or refer to the official complaints policy here: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf.

Cell Phone Etiquette Please put all cell phones or other electronic devices on “**silent mode**” during all class and discussion periods. Please do not leave the classroom during lecture to make a phone call, use the 5-minute break. Use your cellphone only for *Learning Catalytics* activities while class is in session. Thank you!

Honor Code This class will operate under the policies of the student honor code which can be found at: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>. The students, instructor, and TAs are honor-bound to comply with the Honors Pledge: **We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.** You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit 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."* It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks. Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>.

If you have further questions, please contact me. Have a great semester!

Sincerely,

Valeria
Associate Professor of Chemistry

