



CHM2047 FUNDAMENTALS OF THE COURSE (syllabus)

Designed for entering (not transfer) students who wish to move more quickly into advanced coursework. Electronic structure and bonding, gases, liquids, solids, kinetics, equilibria, acids and bases, thermodynamics, oxidation-reduction.

PREREQUISITES

AP, IB, AICE, (Chem and Math) or dual enrollment chemistry courses with credit for CHM2045/L CHM2046/L; Coreq: CHM 2047L. 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/>.

INSTRUCTOR

Professor Valeria Kleiman (she/her). e-mail: CANVAS inbox service. Office hours are listed in the table below or by appointment

TEACHING ASSISTANTS

You got lucky! We have the BEST teaching team in Chemistry!

Juan Sanfiel	jsanfiel28@ufl.edu
Ignacio Pickering	ipickering@chem.ufl.edu

In addition, five "peer mentors" will help lead class breakout rooms and Wednesday discussion sessions. The peer mentors are students who successfully completed CHM2047 last Fall. Not only did they come out in the top of their class, but they were recommended for this position by their peers. Having taken the class last fall, they are very attuned with the fast pace and demands of this course.

Alec Adam	apaul.adam@ufl.edu
Mia Kittredge	mkittredge@ufl.edu
Michael Poole	michaelpoole1@ufl.edu
Syed Tahir	stahir@ufl.edu
Zachary Freeman	zwilliam.freeman@ufl.edu

TEXTBOOK

Trying to make the college experience more accessible I created an online FREE BOOK for this class. This book has been designed following the syllabus of CHM2047. The book is part of Open Education Resources and can be accessed within the Libretext Library: [CHM2047 BOOK](#)

Reading assignments ought to be completed before coming to class to allow for better comprehension of the material during lecture.

CLASS and 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, you are encouraged to go to multiple office hours to help the learning process. Office hours are held in CBB Room 203

Period time	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
02 8:30 -9:20			4705 Alec Adam		Ignacio
03 9:35- 10:25		Lecture Valeria Kleiman & Teaching Team CBB221	4704 Michael Poole	Lecture Valeria Kleiman & Teaching Team CBB221	Syed
04 10:40-11:30			4702 Zachary Williams		
05 11:45- 12:35	Zachary		4701 Mia Kettridge	Michael	Juan
06 12:50- 1:40		Michael	4703 Syed Tahir		
07 1:55 - 2:45	VDK		VDK	Alec	Zachary
08 3:00 - 3:50	Mia	Alec		Ignacio	
09 4:05 - 4:55			Juan		Mia
10 5:10- 6:00	Ignacio	Syed			
11 6:15-7:05			Juan		

GRADES

Grades are based on your own performance, as is 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.

A student contending that a HW, 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. If this does not resolve the issue you may talk to Professor Kleiman

Activity	Contribution to grade
Think About Videos	35%
Video Quizzes	10 %
HW	35 %
Participation	20%

From	To	Letter grade
87 %	100 %	A
84 %	86.99 %	A-
81 %	83.99 %	B+
78%	80.99 %	B
75 %	77.99 %	B-
72 %	74.99 %	C+
69%	71.99 %	C
66%	68.99 %	C-
63%	65.99 %	D+
60 %	62.99 %	D
50	59.99 %	D-
0	49.99 %	E

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.

UF GUIDING POLICIES

- **Contact Hours:** "Contact Hours" refers to the hours per week in which students are in contact with the instructor, excluding office hours or other voluntary contact. The number of contact hours in this course equals the number of credits the course offers.
- **Workload:** As a Carnegie I, research-intensive university, UF is required by federal law to assign at least 2 hours of work outside of class for every contact hour. Work done in these hours may include reading/viewing assigned material and doing explicitly assigned individual or group work, as well as reviewing notes from class, synthesizing information in advance of exams or papers, and other self-determined study tasks.
- **Accommodation for Student with Disabilities:** 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/students/get-started/> . This class supports the needs of different learners; 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.
- **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.
- **Teaching 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 from [the Gatorevals website](#). 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 [the evaluation system](#). Summaries of course evaluation results are available to students at the [public results website](#).
- **Course Recording:**

Pursuant to Florida House Bill 233, which you can see [here](#) , please note the following:

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.

ADDITIONAL RESOURCES

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/>.

Infirmary (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: <http://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.

ADDITIONAL INFO

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 class activities while class is in session. Thank you!

Calculator: You must have your own scientific calculator. Calculators may be used on quizzes and exams but may not be shared.

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/> ↗



The goal of the course is to give an overview of basic chemistry in one semester and to prepare the students for subsequent work (organic, inorganic, analytical, and physical chemistry).

OBJECTIVES

The course provides 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 takes an 'atoms-first' approach in order to lay a conceptual foundation for the many aspects of 'macroscopic' chemistry.

Approximately 35% of the course is devoted to atomic and molecular structure and bonding. This allows the student to comprehend and predict the behavior of chemical systems rather than to memorize a potpourri of diverse facts.

Approximately 35% of the course is devoted to fundamentals of thermodynamics and thermochemistry. In this area, an atomic and a statistical approach is implemented.

Approximately 30% of the course is devoted to chemical equilibrium in its many different forms.

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 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:

- Preparation for class discussion by watching the assigned videos BEFORE class time.
- Class attendance requires active engagement 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.
- Active participation in the class discussion, and through working out problems in breakout rooms.
- 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 problem solving 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 (whether virtually or in person) 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 a computational 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.
- Emphasis is placed on testing the students' reasoning skills and their understanding of the material rather than rote memorization of facts. This will be accomplished using submitted videos (Think Aloud Videos) where students show how a problem is approached, solved, and checked.
- Participation in one or more of the multiple 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. It is expected that students will participate in one or more office hours a week.

HOW TO SUCCEED IN THIS COURSE

The material covered in CHM2047 is described in the online textbook and pre-recorded videos. Watching the videos and reading the assigned chapter BEFORE class time will allow you to participate in the lecture discussions, understand the topic and ask questions about confusing concepts. The instructor builds upon the video and textbook reading material therefore it is critical that students come to class prepared.

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, watching the videos and following in-class discussion, seek help, and the sooner the better!**

The teaching-team overarching goal is 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, review the available videos, form a study group, consult other text books, etc.

It is highly encouraged to form **study groups** and meet with them on a weekly basis to discuss course material. 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.

Good learning habits are learned and once part of your life, they'll be useful in all your college courses.





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/>).

ACCESS to VIDEOS

Pre-recorded videos are required material for the course. Assigned videos (about 2-2.5 hr per week) are available in the [CHM2047 Channel](#) . The material covered on these videos will be discussed and used to solve in-class problem.

For help with any technical issue please contact the help desk. 352 392-HELP (4357) or go to [HELPOESK](#) .

ACCESS to LECTURE NOTES

Lecture notes are accessible through OneNote (Microsoft Office suite). You can open the [CHM2047 F21 Notebook](#) in the desktop app or online (see [UF APPS](#)). These notes DO NOT Replace the book, they are only a handwritten review of the topics covered during lecture time.

These notes accompany the lecture VIDEOS. For help with any technical issue please contact the help desk. 352 392-HELP (4357) or go to [HELPOESK](#) .

ACCESS to TEXTBOOK

The course is accompanied by a specially designed free text. Each chapter is associated with the classroom work. To access the book go to LIBRETEXT: [CHM2047 BOOK](#) .

PLOTTING SOFTWARE

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.

However you make a plot you must have the capability to create a pdf file to submit them with your HW.



This classes uses different environments to learn chemistry. All activities and assignments have been designed to maximize student/instructors and student/student interactions. A combination of in-class and out-of-class assignments provides a more meaningful environment to understand new material and to demonstrate proficiency.

ATTENDANCE

Attendance to class-time and discussions is fundamental to understand the material and engage with the instructor and other students. Attendance to lectures, discussion and office hours, though not required, it is expected. The 2-period class (T and R) will combine a discussion of the pre-viewed video, with group work solving problems.

Watching the **pre-recorded lectures** and **reading the book BEFORE** lecture time is paramount to keep up with the fast pace of the course.

According to UF regulations, In addition to the 5 hrs class a week, a minimum of 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 this reason Attendance is graded as part of the engagement rubric (see below).

ENGAGEMENT

In order to engage with the course material and your classmates, active participation is expected at all class sessions. Furthermore, because each class discusses material from the pre-recorded videos it is imperative that students be ready to participate in every lecture, in every discussion session and when attending office hours.

Rather than attempting to quantify an arbitrary "class participation" construct, in this class you will be assessed on any and all demonstrations of your willingness and ability to engage with the course material, with your classmates, with the Teaching Assistants and with your professor. Evidence of engagement can take many formats, and it is evaluated during lectures, discussion and office hours. It includes all ranging from (but by no means limited to):

- Offering thoughts and reactions to the videos
- Asking questions in or out of class
- Solving problems during class and during discussion sessions
- Treating classmates, colleagues, professors with respect
- Visiting office hours
- Sharing additional readings or resources with classmates
- Offering assistance/guidance/advice to your classmates

We will keep track of your Engagement throughout the semester, with grades assigned approximately every three weeks, following this [RUBRIC](#)

- HOMEWORKS

They are assigned weekly and, in most cases, the deadline for submission is one week after assignment.

Late HW policy: HW is late if it is not uploaded by the deadline. 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. If it's deadline time and you have not finish the HW, submit it anyway. You will get feedback on the problems you solved and you will get partial credit!

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, we encourage you to 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.

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 pdf 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.

Each week a chosen number of problems will be used for additional evaluation (see "Think Aloud Videos").

- On-Line QUIZZES

There will be multiple (more than 25) on-line (CANVAS) quizzes. Quiz duration varies and some of them (not all) may be taken twice with the best result counting toward your grade. Quiz answers must be your own, not shared with other students.

- THINK ALOUD VIDEO

Think aloud videos will be used to evaluate proficiency. Each week, one HW problem will be selected and students will prepare an individual video on how to solve that HW problem.

The task is to create a short video explaining how to solve the HW problems as if you are teaching someone who doesn't know what to do. During the semester you will prepare at least 5 of these videos.

- FINAL EXAM

This course does not have in-class exams.

Final exam: The final exam is optional. If a student is happy with their grade at the end of the semester they may skip the final exam. Since the final exam is cumulative, 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 their exam grades over the course of the semester.