CHM1030 BASIC CHEMISTRY I

FALL 2024; CLASS NUMBERS 10746, 10747, 10745

INSTRUCTOR INFORMATION

Instructor

Melanie Veige melveige@ufl.edu Email in Canvas only 352-392-0518 SFH 103

Email/Office/Phone

Preferred Contact

Email through Canvas messaging Zoom office hours TR 10-11 am

TEACHING ASSISTANTS

Grad TAs: TBA

Email: through Canvas email; Office hours (via Zoom): see Canvas for schedule

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

COURSE DELIVERY/MEETING TIMES

The course is 100% online/asynchronous. Students read through the text material and watch recorded lecture videos such that they keep up with the posted course schedule. Office hours are scheduled regularly, during which time students may attend to ask course-related questions. Outside of office hour times, students can post questions to the course Discussion Boards or use Canvas email.

COURSE FEES

Additional Course Fees: \$27.99

AUDIO/VIDEO PRESENCE POLICY

As in all courses, unauthorized recording and unauthorized sharing of recorded materials are prohibited.

GENERAL INFORMATION

PREREQUISITES

High school algebra.

COURSE DESCRIPTION

This course provides students with an introduction to chemical principles and applications for the non-science major. Students will engage in problem solving and critical thinking while applying chemical concepts. Topics will include the scientific method of problem solving, classification of matter, atomic theory, the periodic table, gases, chemical reactions, energy, and chemical bonds. (P)

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 the outcomes of experiments.

Student Learning Outcomes:

- 1. Students will be able to distinguish between physical and chemical properties and changes.
- 2. Students will recognize components of gaseous chemistry.
- 3. Students will recognize components of aqueous chemistry including properties of water, solutions, and acids and bases.
- 4. Students will correlate the design of the periodic table to periodic trends and physical and chemical properties of elements
- 5. Students will write and interpret chemical formulae and write balanced chemical equations.

The course objectives align with the UF General Education student learning outcomes and <u>physical science</u> <u>area learning outcomes</u>:

General Education SLO	Physical Science SLO	Course Objective Alignment	Assessment
Content	Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems.	Objectives 1-5	All assessments and student practice assignments offer opportunities for students to demonstrate content knowledge.
Critical Thinking	Formulate empirically-testable hypotheses derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve	Objectives 1-5	Discussions, Essay, Presentations, Infographics, Quizzes, and Assignments based on interactive simulations.

	scientific problems and to evaluate outcomes.		
Communication	Communicate scientific knowledge, thoughts, and reasoning clearly and effectively.	Objectives 1-5	Discussions, Essay and Biography, Infographics, Videos, Presentations, assignments based on interacting with online simulations, and peer reviews.

COURSE LEARNING OUTCOMES

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

FIRST DAYS

Log into Canvas and access the course. You should check daily for new Announcements and/or emails containing important information and reminders. Click on the *Syllabus* tab to view all due dates for the entire semester. Click on *Modules* and read all the information under the *Settling In* section.

REQUIRED & RECOMMENDED COURSE MATERIALS

Achieve: Essentials of General, Organic and Biochemistry 3e. Electronic access is required which includes an ebook and online homework/assignments. Students are directed to relevant readings each week in the text and to supplemental resources. Readings for each module are estimated to require no more than 1 h and generally consist of specific sections from OpenStax Chemistry.

CALCULATOR

You require a scientific calculator capable of logarithmic functions.

COURSE COMMUNICATIONS

GENERAL QUESTIONS

General course questions should be posted to the Discussion: Course Q&A in Canvas. The instructor/TA response time is <48 h (typically <24 h) during the work week.

I encourage you to post questions related to homework or end of chapter questions you're working on to the Discussion board. The homework isn't meant to be a test, it's a learning tool. For the best response, take a screenshot of your question and/or the solution you propose. The more information you provide, the easier it is for your instructor/TA/another student to help.

This course is a fast-paced 3-credit course covering a range of general chemistry topics. Content builds rapidly as we proceed. Make sure you don't fall behind. The course has no set meeting times, and broad timelines over which readings/videos should be completed as a result. Assignment/quiz/exam/project due dates, however, are firm and are not a guideline.

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.

COURSE POLICIES

SYLLABUS QUIZZES/SURVEYS

A syllabus quiz and other introductory quizzes are delivered near the beginning of the course to ensure you have reviewed course policies and read the syllabus. Surveys are delivered mid-semester and near the end of term to gather feedback on course design and delivery.

You can submit these assignments late, with a 20% penalty per day submitted late. Make sure to open and submit the quizzes for all attempts prior to the due date to avoid the late penalty. Note that even 1 s past the due date counts as a whole day late.

Time required to complete each is estimated to be <10 min.

ACHIEVE QUIZZES/HOMEWORK ASSIGNMENTS

Sectional quizzes are delivered through the Achieve platform. Grade details are prominently posted in Achieve for each. Each can be submitted late, with a penalty per day submitted late. Each is estimated to require 30-60 min to complete. Homework assignments are delivered via the Achieve platform and can be done late for reduced credit. Estimated time to complete is 60 min.

DISCUSSIONS

Lessons may involve discussion assignments in which you are asked to associate content with practical applications, such as calculation and analysis of water footprint, personal radiation dose, or to critically analyze an advertisement making scientific claims. Grading rubrics are prominently posted in Canvas for each. Discussions require timely, substantive comments on classmates' posts to foster a collaborative learning environment in this asynchronous course; students don't work synchronously on the lessons, but each does span a specified period. Each is estimated to require 10 min to complete.

ASSIGNMENTS

Each third of the course includes at least one Project. These take the form of presentations (Google Slides/PowerPoint presentations, with and without audio/video), an infographic, or and a short essay. Each assignment encourages you to relate the content coverage with real-world scenarios personal to you and allows a degree of creativity in production. Each of these allows you to communicate to your instructor and TAs your understanding and ability to apply concepts and to distil and analyze information you have curated. Each is estimated to require 2-3 h of research time and an additional 90 – 120 min to complete.

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: <u>https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/</u>

GRADING

GRADE POLICY

There is no extra credit available for this course. Grades are not rounded at the end of term. Exam grades or course grades are not curved.

Assignments weights are as follows:

Assignment Group	Weight %
Syllabus/Surveys	5%
Homework	15%
Quizzes	15%
Projects	10%
Progress Exams (3 @ 13%)	39%
Final Exam	16%

Grade scale (note: there is <u>no rounding</u> to your score in Canvas):

Letter	Α	A-	B+	В	B-	C+	С	C-	D+	D	D-	E
Cutoff	90.0	87.0	84.0	81.0	78.0	75.0	72.0	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 disability.ufl.edu/students/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.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following 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 (e.g. assignments, papers, quizzes, exams). 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: http://www.dso.ufl.edu/SCCR/honorcodes/honorcode.php."

CAMPUS RESOURCES

U Matter, We Care: If you or someone you know is in distress, please contact <u>umatter@ufl.edu</u>, 352-392-1575, or visit <u>U Matter, We Care website</u> to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the <u>Counseling and Wellness Center website</u> or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the <u>Student Health Care Center website</u>.

University Police Department: Visit <u>UF Police Department website</u> or call 352-392-1111 (or 9-1-1 for emergencies).

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 <u>UF Health Emergency</u> <u>Room and Trauma Center website</u>.

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the <u>GatorWell website</u> or call 352-273-4450.

ACADEMIC RESOURCES

E-learning technical support: Contact the <u>UF Computing Help Desk</u> at 352-392-4357 or via e-mail at <u>helpdesk@ufl.edu</u>.

<u>Career Connections Center</u>: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

<u>Teaching Center</u>: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the <u>Student Honor Code and Student Conduct Code webpage</u> for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.

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/. 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/.

NETIQUETTE

Please see the detailed Netiquette guide in the Settling In section of the Canvas course.

GETTING HELP

For issues with or technical difficulties with Canvas, contact the UF Help Desk: <u>https://lss.at.ufl.edu/help.shtml</u>; (352)-392-HELP.

Other resources are available at <u>http://www.distance.ufl.edu/getting-help</u> for Counseling and Wellness resources, disability resources, resources for handling student concerns and complaints, and library desk support.

DISCLAIMER

This syllabus represents my 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.

TENTATIVE SCHEDULE OF TOPICS

<u>*The most up to date complete schedule is posted in Canvas</u>. This document may have been updated since posting – check Canvas for details.

Due to the nature of the online asynchronous course, required readings are given for a week or half-week. Students will need to plan their own time accordingly. Due dates represent the last day assignments/quizzes can be completed for full credit. Each is open well in advance and can be worked on ahead of time leading up to the due date. Many can be completed late for reduced credit, with a penalty per day late.

MA = Macmillan Achieve; Grade Categories: S (orientation/syllabus/surveys) ; EC (extra credit) ; P (practice, not for credit)

WEEK	DATES	TOPICS	READINGS (Guinn)	ASSIGNMENTS
1	Aug. 19-23	Ch. 1: Introduction/Orientation.	Ch. 1 (p. 1-43)	
2	Aug. 26-30	Matter, energy, units and measurements. SI units, imperial units, exact and measured numbers. Significant figures in measurements and in	Ch. 1 (p. 1-43)	Friday MA Orientation Assignment (S) MA Practice Assignment (S) MA Math Review (ungraded)

		calculations. Dimensional analysis and problem solving. Temperature scales and conversions between temperature scales.		MA Intro Survey (S) MA MUST Test (EC) Introduce Yourself Discussion (S)
3	Sept. 2-6	Ch. 2: Elements, the atom, average atomic mass, isotopes. The periodic table of the	Ch. 1 (M-W; p. 1-43) Ch. 2 (W-F; p. 43-85)	Wednesday MA Ch. 1 Homework MA Ch. 1 Quiz
4	Sept. 9-13	periodic table of the elements (groups, periods, metals, nonmetals, metalloids). Elements in biochemistry and medicine. Electron arrangement and valence electrons. Periodicity. Radioisotopes and radioactive decay. Electromagnetic radiation, the electromagnetic spectrum, penetrating power of radiation. Biological effects of radiation	Ch. 2 (p. 43-85)	Friday MA Ch. 2 HW MA Ch. 2 Quiz
5	Sept. 16-20	Ch. 3: Ionic compounds including polyatomic ions. Covalent/molecular compounds. Lewis structures, the octet rule, expanded octets.	Ch. 3 (p. 85-119)	
6	Sept. 23-27	Ch. 4: 3D shapes of molecules, electronegativity and polar and nonpolar bonds, molecular polarity. Intermolecular forces of attraction and effect on physical properties.	Ch. 3 (M-W; p. 85- 119) Ch. 4 (W-F; p. 119- 153)	Wednesday MA Ch. 3 HW MA Ch. 3 Quiz Thursday Adaptive Quizzes Ch. 1, 2, 3 (P) Friday Exam 1 Project 1
7	Sept. 30-Oct. 4		Ch. 4 (p. 119-153)	Tuesday MA Checkpoint Survey (S) Friday

				MA Ch. 4 HW MA Ch. 4 Quiz
8	Oct. 7- 11	Ch. 5: The mole, Avogadro's number. Molar mass and formula mass. Writing and balancing chemical equations and identifying types of chemical reactions. Predicting products of chemical reactions. Stoichiometric calculations.	Ch. 5 (p. 153-185)	
9	Oct. 14-18	Ch. 6: Energy and chemical reactions, units of energy, exothermic and endothermic reactions. Energy stored in bonds, and energy diagrams. Energy and metabolism in cells. Rates of chemical reactions, activation energy, factors affecting reaction rate, catalysis. Chemical equilibrium and le Chatelier's principle	Ch. 5 (M-W; p. 153- 185) Ch. 6 (W-F; p. 185- 215)	Wednesday MA Ch. 5 HW MA Ch. 5 Quiz
10	Oct. 21-25		Ch. 6 (p. 185-215)	Friday MA Ch. 6 HW MA Ch. 6 Quiz
11	Oct. 28- Nov. 1	Ch. 7: Changes of state, energetics and intermolecular forces. Heats of fusion, vaporization, and melting and boiling points. Heating and cooling curves. Properties of gases, the gas laws, and gas mixtures.	Ch. 7 (p. 215-253)	Monday Exam 2 Project 2 Wednesday MA Checkpoint Survey (S)
12	Nov. 4- 8	Ch. 8: Mixtures, solutions and measuring concentration. Dosage and dilution calculations.	Ch. 7 (M-W; p. 215- 253) Ch. 8 (W-F; p. 253- 299)	Wednesday MA Ch. 7 HW MA Ch. 7 Quiz
13	Nov. 11-15	Osmosis and dialysis.	Ch. 8 (p. 253-299)	Friday MA Ch. 8 HW MA Ch. 8 Quiz

14	Nov. 18-22	Ch. 9: Acids and bases (Arrhenius and Bronsted- Lowry), conjugate acid/base pairs, pH and related calculations, and strength of acids and bases. Neutralization reactions, and buffers including physiological examples.	Ch. 9 (p. 299-341)		
15	Nov. 25-29		Lowry), conjugate acid/base pairs, pH and related calculations, and strength of acids and bases. Neutralization reactions, and buffers including physiological examples.	Thanksgiving Holidays	
16	Dec. 2- 6			Tuesday MA Ch. 9 HW MA Ch. 9 Quiz Wednesday Exam 3 Project 3	
17	Dec. 9- 13			Wednesday Final Exam	

SAMPLE GRADING RUBRICS

DISCUSSION RUBRIC (Sample)

Criteria	Ratings		Points		
Location	1 pts			1	
	Full Marks	0 pts			
	The student indicates	No Marks			
	the location.	The student does not ind location	The student does not indicate their chosen location		
AQI	2 pts	0 pts		2	
	Full Marks	No Marks			
	The student lists the AQI for all pollutants present at the location.	The student does not ind pollutants at the location			
Source	2 pts	1 pts	0 pts	2	
	Full Marks	Partial Marks	No Marks		
	The student proposes possible sources of the pollutants, specific for their particular location.	The student proposes possible sources butThe student does not propose possibledoes not relate them to their chosen location.sources of pollutants that relates to their location and/or AQI.			
Health	2 pts	1 pts	0 pts	2	
	Full Marks	Partial Marks	No Marks		

	The student discusses health effects at measured levels for each pollutant mentioned for their location.	The student may discuss health effects but not at specific levels, or may omit one or more pollutants mentioned.	The post is insufficient.	
Comments	2 pts Full Marks The student makes substantive comments on at least two classmates' posts.	1 pts Partial Marks The student makes substantive comments on one classmate's post.	0 pts No Marks The student does not make substantive comments.	2
Total				9

Short Essay Rubric (Sample)

Criteria		Rat	ings		Points
Completeness	10 pts	6 pts	6 pts 3 pts		10
	Full Marks	Partial Marks	Partial Marks	No Marks	
	The student fully describes two examples of the scientific method, identifying all required steps.	The student describes two examples of the scientific method but either does not describe the examples thoroughly enough or does not identify all required steps.	The student describes one example of the scientific method but either does not describe the examples thoroughly enough or does not identify all required steps.	The student describes their example(s) of the scientific method poorly.	
Similarities and	5 pts	3 pts	2 pts	0 pts	5
differences	Full Marks	Partial Marks	Partial Marks	No Marks	
	The student identifies at least two similarities and/or differences in the authors' approaches to using the scientific method.	The student identifies one similarity and/or difference in the authors' approaches to using the scientific method.	The student inadequately identifies one similarity and/or difference in the authors' approaches to using the scientific method.	The student does not identify any similarities and/or differences in the authors' approaches to using the scientific method.	
Citations	2 pts	1 pts		0 pts	2
	Full Marks	Partial Marks		No Marks	
	The student provides two	The student provide source used.	s one citation for the	No citations or inadequate	

	citations for the sources used (movies, novels, audiobooks).		citations are provided.	
Total				17