

# Syllabus: CHM 2045 Chemistry 1

Spring 2024

Welcome to Chemistry 1. This course is part of the STEM core, a set of six critical and foundational courses consisting of mathematics, chemistry, physics, programming, and STEM applications. These courses build the skills and conceptual understanding you need to succeed in all degree programs. Completing these courses early in your university education builds the foundation for academic success in FL Poly's STEM degrees and creates a smooth path to degree completion.

The STEM core courses share many of the same course policies. Moreover, the courses strive to set consistent expectations of what it means to take responsibility for your own out of class learning and honing your skills to do university-level work. They are challenging, so make these STEM Core courses a priority!

## Course Information

- **Course Number and Title:** CHM 2045 Chemistry 1
- **Credit Hours:** 3 credit hours
- **Academic Term:** Spring 2024

## Instructor Information

- **Instructor:** Dr. Tracy Olin
- **Office Location:** BARC 2262
- **Office Hours:** In-person MWF 10:00 am -11:00 am or by appointment
- **Email address:** tolin@floridapoly.edu

## Course Delivery and Course Description

- **Delivery Mode:** This course will be held face-to-face (in-person) at the rooms and times given below.
  - Section 1:** IST-1067 MWF 8:00 am – 8:50 am (Dr. Kaushik)
  - Section 2:** IST-1067 MWF 9:00 am – 9:50 am (Dr. Sista)
  - Section 4:** IST-1067 MWF 11:00 am – 11:50 am (Dr. Sista)
  - Section 6:** IST-1067 MWF 1:00 pm – 1:50 pm (Dr. Olin)
  - Section 7:** IST-1067 MWF 2:00 pm – 2:50 pm (Dr. Olin)
- **Official Catalog Course Description:** This course introduces the principles of chemistry and their applications based upon the study of physical and chemical properties of the elements. Topics covered in this class includes stoichiometry, atomic and molecular structure, the states of matter, chemical bonding, thermochemistry, and gas laws.
  - **Course Pre-Requisites:** N/A
  - **Course Co-Requisites:** CHM 2045L – Chemistry 1 Laboratory
  - **Communication/Computation Skills Requirement (6A-10.030):** No

- **Required Texts and Materials:**
  - Brown, T.E.; LeMay, H.E.; Bursten, B.E.; Murphy, C.; Woodward, P.; Stoltzfus, M.E. Chemistry: The Central Science (15th edition); Pearson: New York, NY. ISBN: 9780137542970
  - All STEM Core courses will require the [Texas Instruments TI-30XIIS calculator](#). This is the **only** calculator version that is allowed on exams. The use of any other type of calculator will not be permitted on exams. It is advised that you obtain this calculator and become familiar with it prior to the first exam. It is also strongly recommended that you bring it to class daily, as there may be in-class work that requires the use of a calculator.
  - Access to the course Canvas LMS website. Course resources will be posted here, including any course announcements, changes in the syllabus, etc. The Homework will also be through the Canvas website.
  - Access to the University Email System.
- **Communication:** Florida Polytechnic University email is the official method of communication for the University. Students are required to check their email frequently. The subject of your emails must start with "CHM 2045 Section X" followed by the topic. Failure to provide the correct subject, may result in ignoring the email or delayed response. Any email received from an address other than the one with the floridapoly.edu domain will not be replied to. Emails will typically be answered within 24-48 hours, Monday-Friday.

## Course Objectives and Outcomes

- **Course Objectives:**  
At the end of this course, you should be able to:
  - Apply appropriate scientific methods (unit/dimensional analysis/vocabulary/etc.) in problem solving exercises.
  - To interpret chemical equations and make chemical calculations.
  - Relate atomic and molecular structure to explain chemical and physical properties of elements.
  - Understand the thermodynamic changes that accompany physical and chemical processes.
  - Understand types of chemical bonding, Lewis Structures and apply the knowledge to predict molecular geometry of the molecules.
  - Correlate basic chemistry to explore the fundamentals of advanced technologies useful for real-life problems of societal, global, environmental, and economic consequence.
  - Understand and execute processes to solve problems.
  - Understand how active engagement is needed for professional success through cultivating collaboration with multidisciplinary teams-based approaches, which will help to improve technical knowledge, communication abilities, and leadership skills.
- **Course Learning Outcomes:**  
Students who pass CHM-1 are expected to demonstrate:
  - Ability to understand the fundamental concepts of chemistry (formula, equations, units, scientific vocabulary, and process).
  - Use stoichiometric methods to convert between units, such as mass, moles, and concentration.
  - Relate the quantum numbers and electron configurations of atoms to the periodicity in chemical and physical properties of elements as represented in the periodic table.
  - Predict the bonding and resulting geometry of atoms in molecules.
  - Determine enthalpy change in chemical reactions-First Law of Thermodynamics.

- Employ the kinetic theory of gases and the ideal gas laws to determine pressure, volume, temperature, and/or amount of a gas.
- Ability to execute lecture learning to develop and conduct appropriate experiments, analyze, and interpret data, and draw conclusions.
- **Alignment with Program Outcomes:**
  - This course supports General Education competency for scientific reasoning. Program Learning Outcomes and General Education Competencies may be found in the Academic Catalog (<http://catalog.floridapoly.edu/>). Additionally, outcomes may be aligned with level of difficulty per Bloom's taxonomy (see University's Institutional Effectiveness Manual for Academic programs).

<b>Course Learning Outcome</b>	<b>Learning Level</b> (e.g. Bloom's, Anderson/ Krathwohl; Rogers Hatfield (ABET Assessment Example)	<b>Program Learning Outcome (ABET, GenEd, Other)</b>
Learning and exploring chemistry via critical thinking based on Socio-Chemistry (problem-oriented approach to chemistry teaching)	Understand Categorizing Predicting Compare and contrast	1-a
Exploring chemistry as engineering based on mathematical approach and applications	Apply Implementing	1-e, 1-k
Ability explore chemistry in application aspects for example, Redox chemistry, Thermal energy changes involved, etc.	Analyze Differentiating Classifying Identifying	2-c, 2-k
Ability to discuss chemistry, understanding of theories in the manner of a problem solving approach	Evaluate Predict Judging	3-g, 4-f, and 5-d
Applying knowledge of lectures in laboratory experiments	Create Hypothesizing Coordinating	6-b, 7-i
Introducing analytical aspects in lectures to understand examples	Application	6-k
Motivating students for upper-level courses, advanced training, and growing up as a scientist		5-d, 7-i

## Course Schedule

### Tentative Weekly Schedule:

Week	Topics	Chapter/Sections
1/8 – 1/12	Syllabus, <b>Concepts of matter</b> : Basic definitions, measurements and units, uncertainty and significant figures	Ch 1.1-1.3, 1.5-1.6
<b>1/15</b>	<b>MLK DAY-No Classes</b>	
1/15 – 1/19	Problem-Solving- Dimensional analysis <b>Atoms and Elements</b> : Atomic theories, structure of atom, atomic symbols, isotopes	Ch 1.7, 2.1-2.3
1/22 – 1/26	average atomic mass, the periodic table <b>Molecules and Compounds</b> : ions and Ionic formulas, polyatomic ions, naming compounds	2.4-2.8 <b>HW #1 due 1/22</b>
1/29 – 2/2	Naming (cont.) <b>Chemical Reactions and Chemical Quantities</b> : Balancing chemical equations, Types of chemical reactions, formula weights, the mole concept, molar mass, percent composition, empirical formulas	3.1-3.4 <b>HW #2 due 1/29</b>
2/5 – 2/9	<b>Stoichiometry</b> : Limiting reactant and reaction yields <b>Introduction to Aqueous Reactions</b> : precipitation reactions, solubility rules, Net ionic equations <b>Midterm #1 – February 9 – during regular class time</b>	3.5-3.7 4.2 <b>HW #3 due 2/5</b>
2/12 – 2/16	Acid-Base reactions, neutralization, titrations, oxidation-reduction reactions, activity series <b>Aqueous solutions</b> : Conductivity	4.3-4.4, 4.1 <b>HW #4 due 2/12</b>
2/19 – 2/23	Molarity and solution concentrations, Dilution <b>Properties of gases</b> : gas laws, ideal gas law, gas mixtures/partial pressures	4.5 10.1-10.4 <b>HW #5 due 2/19</b>
2/26 – 3/1	Kinetic-Molecular theory, diffusion <b>Thermochemistry</b> : Energy, heat transfers, quantifying Heat and Work, Enthalpy, heat capacity/specific heat	10.5-10.6 5.1-5.5 <b>HW #6 due 2/26</b>
3/4 - 3/8	<b>Spring Break - No Classes</b>	
3/11 – 3/15	Calorimetry-measuring Delta Hrxn Hess's law, Standard Enthalpies of Formation <b>Midterm #2 – TBD – will be a common exam</b>	5.6-5.7 <b>HW #7 due 3/11</b>
3/18 – 3/22	<b>The Quantum Mechanical Model of the Atom</b> : EM radiation, frequency and wavelength, Photoelectric effect, Diffraction & interference	6.1-6.2 <b>HW #8 due 3/18</b>
3/25 – 3/29	Atomic emission, line spectra, Bohr model, uncertainty principle, atomic orbitals, electronic structure of atoms, quantum numbers and electron configurations <b>Periodic Properties of the Elements</b> : effective nuclear charge	6.3-6.8 7.1-7.2 <b>HW #9 due 3/25</b>
4/1 – 4/5	<b>Periodic trends</b> : atomic size, ionization energy and electron affinity <b>Chemical Bonding I</b> -The Lewis Model: the octet rule	7.3-7.4 8.1-8.2 <b>HW #10 due 4/1</b>
4/8 – 4/12	Lewis symbols, Ionic bonding, covalent bonding, electronegativity, bond polarity, Lewis structures, formal charge, resonance structures <b>Midterm #3 – April 12 during regular class time</b>	8.3-8.6 <b>HW #11 due 4/8</b>
4/15 – 4/19	Octet exceptions, bond energies and bond lengths VSPER model-effect of lone pairs, molecular polarity	8.7-8.8 9.2-9.3 <b>HW #12 due 4/15</b>

4/22 – 4/24	<b>Chemical Bonding II:</b> covalent bonding/orbital overlap, hybrid orbitals, Hybridization	9.4-9.6 <b>HW #13 due 4/22</b>
4/25 & 4/26	<b>Reading Days-NO CLASS</b>	
<b>FINALS WEEK</b>	<b>S, M-Th</b> <b>April 27, April 29 – May 2, 2024</b>	

## Academic Support Resources

- **Library:** Students can access the Florida Polytechnic University Library through the University website and [Canvas](#), on and off campus. Students may direct questions to [library@floridapoly.edu](mailto:library@floridapoly.edu).
- **Peer Learning Strategists (PLS):** Are specially trained student leaders who help their peers strategize approaches to course content and work through solution methods. PLS work in collaboration with the courses they support so the content and methods are aligned with your instructors' expectations. Students can meet with a PLS in The Learning Center, which is located on the first floor of the Innovation, Science and Technology (IST) building in room 1019.
- **Academic Success Coaches:** All students at Florida Poly are assigned an Academic Success Coach. Your Academic Success Coach can assist you with academic success strategies. Please visit the Student Success Center on the second floor of the IST building to meet with an Academic Success Coach.
- **Writing Center:** Located on the second floor of the IST (2059/2061), the Writing Center helps students to develop their writing and presentation skills. Consultations are available in person and virtually. For more detail, visit [floridapoly.edu/writing-center](http://floridapoly.edu/writing-center).

## Civility and Collegiality

Faculty and students come to the university for the same reason, which is to participate in a highly professional educational environment. To that end, both students and faculty are expected to treat each other with mutual regard and civility. Communication, written, oral and behavioral, between faculty and students must remain respectful. Within and outside of the classroom, students must refrain from derogatory comments toward the faculty member and their fellow students, and faculty as well must refrain from derogatory comments toward their students. Faculty and students should address each other with respect, in accordance with the wishes of the faculty and the students: for example, no one should be addressed by their last name alone.

Faculty from the outset of a course can and should specify what constitutes activities and behavior that take away from, that diminish, the educational environment. An individual student's distracting behavior impedes the education of fellow students, which itself is a form of disrespect. Civility and collegiality also include respecting each other's time: for example, neither students nor faculty should arrive late to class (unless unforeseen, pressing circumstances prevail); faculty should be present at the posted office hours; and students and faculty should be punctual when meeting times are scheduled. In more general terms, collegiality means respecting the right of both faculty and students to participate fully and fairly in the educational enterprise.

## Course Policies

Please Note: Changes in this syllabus, assignments, exams dates, etc. may be modified as deemed appropriate. All changes will be announced in class and/or in Canvas Announcements.

## Attendance

- Students in **face-to-face** courses are expected to attend all of their scheduled University classes and to satisfy all academic objectives.
- Attendance will be taken at the beginning of each class period using A+ Attendance through Canvas. It is the student's responsibility to be sure to enter the code each lecture period. If the system is not working properly, let the professor know before or after class so your presence can be documented. Recall, attendance and participation are worth 5% of the overall grade in this course.
- Up to 2 unexcused absences are permitted. Each subsequent unexcused absence will result in a 1% penalty.
- Bonus questions or in-class work may be given out during lecture time. If a student is absent on a day a bonus assignment is given, they will not be awarded any bonus points.
- The instructor will not repeatedly enter your attendance because you forgot to enter it. Please be sure to do this EVERY CLASS PERIOD. After 2 manual entries by the instructor, you will be counted as absent.
- Note: Falsifying attendance for yourself or for another student is an act of academic dishonesty and is considered a violation of the university's academic integrity policy.
- Exceptions to any attendance requirements may be made on a case-by-case basis.

## Participation

Students are expected to participate in the classroom experience. The use of earbuds/headphones during class is specifically not allowed and students who engage in this behavior may be asked to leave the class for the day (noting exceptions for authorized accommodations). In addition, students who routinely do not bring materials to class that are required for participation, will not be given credit for class attendance and participation, and if this becomes a pattern of behavior, may be asked to leave the class for the day. Persistent problems with participation may result in a code of conduct referral.

## Late Work/Make-up work

Make-up exams will be given only in extreme circumstances with a documented university-approved excuse. Any exceptions will be dealt with on a case-by-case basis. If you will miss an exam because you are participating in a college-sponsored activity, inform your instructor before the exam and provide them with documentation. See the [Student Attendance Policy](#) for more information.

Homework answer keys are posted the day after they are due, so for this reason there is no late homework accepted. The lowest homework grade will be dropped at the end of the semester, so if you happen to miss one, this will be your dropped score. You will have roughly 4-5 days to complete the homework once posted. It is strongly encouraged that students do not wait until the last possible minute to complete the assignments in case there is a technical or other issue.

## Grading Scale

Grade	A	B+	B	B-	C+	C	D	F
Percentage	90%	87%	83%	80%	77%	70%	60%	< 60%
GPA	4.0	3.33	3.0	2.67	2.33	2.0	1.0	0.0

## Assignment/Evaluation Methods

### Assignment/Evaluation Methods:

Attendance and participation:	5%
Homework:	25%
Exams (three at 15% each)	45%
Final Exam	25%
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Total	100%

- **Exams:** Midterm exam dates will be finalized early in the semester and those dates/times will be posted to our Canvas course site once available. Exam dates are subject to change and you should refer to the Academic Calendar website for the most up-to-date exam schedules for midterms and finals. Exam dates will also be announced in class and on Canvas roughly one week prior to the scheduled event.
- **Homework:** The weekly homework will be through Canvas and will be due each week on Monday by 11:59 pm. The assignments will open on the Thursday prior to the Monday they are due. The homework due dates are given in the weekly schedule given below. Please see the Late work policy for more information on late homework.
- **Grades on Canvas:** Grades will be posted to Canvas for reference only, and students should make sure they are recorded correctly. However, there is no guarantee that the percentages or projected grades provided in Canvas are correct. The instructor will calculate final percentages and will determine final grades regardless of Canvas calculations.
- **Grade Redemption:** If your final exam score is higher than any of your other exam scores, that score will replace the final exam score.
- If you wish to dispute a score for an assignment or exam, you must describe the nature of the dispute in writing and communicate it through an email no later than one week after the due date/posting the scores of the assignment or the exam. Scores outside of this window will be considered final.

## University Policies

### Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. The University, through the Office of Disability Services (ODS), facilitates reasonable accommodations for students with disabilities and documented eligibility. It is the student's responsibility to self-identify as a student with disabilities and register with ODS to request accommodations.

If you have already registered with ODS, please ensure that you have requested an accommodation letter for this course through the [ODS student portal](#) and communicate with your instructor about your approved accommodations as soon as possible. Arrangements for testing accommodations must be made in advance. Accommodations are not retroactive.

If you are not registered with ODS but believe you have a temporary health condition or permanent disability requiring an accommodation, please contact ODS as soon as possible.

The Office of Disability Services (ODS):

DisabilityServices@floridapoly.edu  
(863) 874-8770  
The Access Point  
[ODS website: www.floridapoly.edu/disability](http://www.floridapoly.edu/disability)

## Accommodations for Religious Observances, Practices and Beliefs

The University will reasonably accommodate the religious observances, practices, and beliefs of individuals in regard to admissions, class attendance, and the scheduling of examinations and work assignments. (See [University Policy](#).)

## Title IX

Florida Polytechnic University is committed to ensuring a safe, productive learning environment on our campus that prohibits sex discrimination and sexual misconduct, including sexual harassment, sexual assault, dating violence, domestic violence and stalking. Resources are available if you or someone you know needs assistance. Any faculty or staff member you speak to is required to report the incident to the Title IX Coordinator. Please know, however, that your information will be kept private to the greatest extent possible. You will not be required to share your experience. If you want to speak to someone who is permitted to keep your disclosure confidential, please seek assistance from the Florida Polytechnic University [Ombuds Office](#), BayCare's Student Assistance Program, 1-800-878-5470 and locally within the community at [Peace River Center](#), 863-413-2707 (24-hour hotline) or 863-413-2708 to schedule an appointment. The Title IX Coordinator is available for any questions to discussion resources and options available.

## Academic Integrity

The faculty and administration take academic integrity very seriously. Violations of [academic integrity regulation](#) include actions such as cheating, plagiarism, use of unauthorized resources (including but not limited to use of Artificial Intelligence tools), illegal use of intellectual property, and inappropriately aiding other students. Such actions undermine the central mission of the university and negatively impact the value of your Florida Poly degree. Suspected violations will be fully investigated, possibly resulting in an academic integrity hearing and sanctions against the accused student if found in violation. Sanctions range from receiving a zero on the exam or assignment, to expulsion from the university. Repeat offenders are subject to more severe sanctions and penalties.

Any "special" instructions that are appropriate for academic integrity and the course should go here.  
*(It is essential that a heading and a statement on what constitutes, includes, academic integrity be included in the syllabus, and that the students be made aware of academic integrity at the beginning of a course.)*

## Recording Lectures

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. Recordings may not be used as a substitute for class participation or class attendance. Recordings may not be published or shared in any way, either intentionally or accidentally, without the written consent of the faculty member. Failure to adhere to these requirements is a violation of state law (subject to civil penalty) and the student code of conduct (subject to disciplinary action).

*Recording class activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), and invited guest speakers is **prohibited**.*