FLORIDA POLYTECHNIC UNIVERSITY

Syllabus: CHM 2045 Chemistry 1

Spring 2026

Welcome to Chemistry 1! Chemistry is a critical and foundational course for all degree programs at Florida Poly. In this course, you will learn fundamental topics, problem-solving techniques and theories that help explain the world as we know it. Chemistry 1 introduces mathematical concepts, units, chemical reactions, thermodynamics and chemical bonding/structure, as well as many other important topics. The course is designed to be fair but challenging.

Success in chemistry requires regular attendance and a consistent work ethic. Taking a serious and professional approach to studying and doing homework is the best way to ensure you meet the learning outcomes for the course. Be familiar with the academic policies outlined in this syllabus and see your instructor with any questions or concerns.

Course Information

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

Instructor Information

- **Instructor:** Dr. Tracy Olin
- **Office Location:** BARC 2262
- **Office Hours**: In-person MF 10:00 am – 11:00 am and W 12:00 pm -1:00 pm or by appointment
- **Email address**: tolin@floridapoly.edu

Course Delivery and Course Description

- **Delivery Mode**: This course will be held in-person at the rooms and days/times given below.
  - **Section 1**: IST-1067 MWF 8:00 am – 8:50 am (Dr. Sista)
  - **Section 2**: IST-1067 MWF 9:00 am – 9:50 am (Dr. Cho)
  - **Section 3:** IST-1067 MWF 10:00 am – 10:50 am (Dr. Cho)
  - **Section 4:** IST-1067 MWF 11:00 am – 11:50 am (Dr. Olin)
  - **Section 5:** IST-1067 MWF 12:00 pm – 12:50 pm (Dr. Knorr)
  - **Section 6:** IST-1067 MWF 4:00 pm – 4:50 pm (Dr. Martin)
- **Course Website:** Official Canvas Course Site
- **Official Catalog Course Description**: This course is designed for students pursuing careers in the sciences or who need a more rigorous presentation of chemical concepts than is offered in an introductory course. Students will engage in problem solving and critical thinking while applying chemical concepts. Topics will include the principles of chemistry including atomic theory, electronic and molecular structure, measurement, stoichiometry, bonding, periodicity, thermochemistry, nomenclature, solutions, and the properties of gases.
  - **Course Pre-Requisites:** N/A
  - **Course Co-Requisites**: CHM 2045L – Chemistry 1 Laboratory

- **Communication/Computation Skills Requirement (6A-10.030)**: No

- **Textbook and Required Materials:**
  - Chemistry: The Central Science 15th edition ISBN: 9780137542758 $89.99 (18-week access code) with access to MyLab and Mastering.
  - Chemistry requires a Texas Instruments TI-30 series calculator (or very similar-must be approved by instructor). No other type of calculator is allowed 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.
  - 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 Objective:** This course (through lectures and problem-solving) is intended to:
  - **Introduce** key chemical concepts such as atomic structure, bonding, stoichiometry, and thermochemistry.
  - **Develop** quantitative and analytical reasoning skills for solving chemical problems.
  - **Connect** chemical principles to experimental design and real-world applications.

- **Student Learning Outcomes:** Upon completion of the course, students should be able to:
  - **Apply** chemical laws and quantitative relationships to solve problems.
  - **Explain** and **predict** chemical behavior using atomic and molecular theories.
  - **Interpret** and **connect** lecture concepts to laboratory experimentation and data analysis.
  - **Communicate** chemical reasoning clearly and effectively.
  - **Acquire** and **apply** new chemical knowledge using appropriate learning strategies.

- **Alignment with Program Outcomes:** Program Learning Outcomes and General Education Competencies may be found in the Academic Catalog (http://catalog.floridapoly.edu/).

Course Learning Outcome	Learning Level	Program Learning Outcome (ABET)
Apply chemical laws and quantitative relationships to solve problems.	Apply, Analyze; Execute; Implement Predicting Compare and contrast	**(1)** Identify, formulate, and solve complex engineering problems using principles of engineering, science, and mathematics.
Explain and **predict** chemical behavior using atomic and molecular theories.	Understand; Interpret; Compare	**(1)** Identify, formulate, and solve complex engineering problems using principles of engineering, science, and mathematics.
Interpret and **connect** lecture concepts to laboratory experimentation and data analysis.	Apply; Evaluate; Integrate	**(6)** Develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
Communicate chemical reasoning clearly and effectively.	Understand; Create; Explain; Compose	**(3)** Communicate effectively with a range of audiences.
Acquire and **apply** new chemical knowledge using appropriate learning strategies.	Understand; Apply; Reflect	**(7)** Acquire and apply new knowledge as needed, using appropriate learning strategies.

Course Schedule: Tentative Weekly Schedule:

Week	Topics	Sections and HW
Week 1 1/12 – 1/16	Syllabus, **Concepts of matter**: Basic definitions, measurements and units, uncertainty and significant figures.	Ch 1.2-1.5
1/19	**Martin Luther King Jr. Holiday – No Classes on 1/19/26**	
Week 2 1/20 – 1/23	Problem-Solving- Dimensional analysis, **Atoms and Elements**: Atomic theories, structure of atoms, atomic symbols,	Ch 1.6, 2.1-2.3
Week 3 1/26 – 1/30	Isotopes, average atomic mass, The periodic table, **Molecules and Compounds**: ions, ionic formulas, polyatomic ions, covalent bonds	2.4-2.7 **HW #1 due 1/26**
Week 4 2/2 – 2/6	**Naming compounds:** ionic & molecular. **Chemical Equations and Chemical Quantities**: Balancing chemical equations, types of chemical reactions **EXAM #1 – Friday, February 6 – in class**	2.8, 3.1-3.2 **HW #2 due 2/2**
Week 5 2/9 – 2/13	Formula masses, The mole concept, molar mass, percent composition, Empirical formulas. **Stoichiometry**: Quantitative Info from Balanced Equations	3.3-3.6 **HW #3 due 2/9**
Week 6 2/16 – 2/20	Limiting reactants and reaction yields. **Introduction to Aqueous Reactions:** Dissociation, Electrolytes, Molarity, Dilution	3.6-3.7, 4.1, 4.5 **HW #4 due 2/16**
Week 7 2/23 – 2/27	Precipitation reactions, solubility rules, Net ionic equations. **Aqueous solutions**: Acid-Base reactions, neutralization, titrations	4.2-4.3 **HW #5 due 2/23**
Week 8 3/2 – 3/6	Redox reactions, activity series. **Properties of gases:** gas laws, ideal gas law, Gas mixtures/partial pressures **Exam #2 – Monday, March 2 - common**	4.4, 10.1-10.5 10.4-10.6 **HW #6 due 3/2**
Week 9 3/9 – 3/13	Kinetic-Molecular theory, **Thermochemistry**: Energy, heat transfers, Quantifying Heat and Work, Enthalpy, Enthalpy of reaction	10.7, 5.1-5.4 **HW #7 due 3/9**
Week 10 3/16 – 3/20	**Spring Break Week – No Classes**	
Week 11 3/23 – 3/27	Heat capacity/specific heat, Calorimetry-measuring ΔH_{rxn}, Hess's law, Standard Enthalpies of Formation, bond enthalpies, Intro to **Quantum Mechanical Model of Atoms,** EM radiation, frequency/wavelength,	5.5-5.7, 6.1 **HW #8 due 3/23**
Week 12 3/30 – 4/3	Photoelectric effect, Atomic emission, Line spectra, Bohr model, Uncertainty principle, atomic orbitals, **Exam #3 – Wednesday, April 1 – in class**	6.2-6.7 **HW #9 due 3/30**
Week 13 4/6 – 4/10	Electronic structure of atoms, quantum numbers and electron configurations, **Chemical Bonding I** -The Lewis Model: The octet rule, Ionic bonding, covalent bonding,	6.8-6.9, 8.1-8.3 **HW #10 due 4/6**
Week 14 4/13 – 4/17	Electronegativity and Bond polarity. Lewis structures, Formal charge, Resonance structures, Octet exceptions, bond strengths and bond lengths,	8.3-8.8 **HW #11 due 4/13**
Week 15 4/20 – 4/24	**VSPER model** - effect of lone pairs, Molecular polarity, Periodic table and Effective nuclear charge **Exam #4 – Monday, April 20 – common**	9.1-9.3, 7.2-7.5 **HW #12 due 4/20**
Week 16 4/27	**Periodic trends:** atomic size, ionization energy and electron affinity, electronegativity	Finish Chapter7 **HW #13 due 4/27**
4/29 – 5/1	**Reading Days – No Classes 4/29 – 5/1**	
FINAL EXAMS	**Monday – Friday 5/4 – 5/8** **Final Exam Day and Time TBD by the University**	

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.

Late Work/Make-up work

Make-up exams will be given only in circumstances with a documented university-approved excuse. Any exceptions will be dealt with on a case-by-case basis. If you know in advance that 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 answers 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:	5%
Homework (lowest grade dropped):	35%
Exams (four at 10% each)	40%
Final Exam	20%
Total	100%

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 part of the overall grade in this course. You will lose part of the 5% attendance grade for each unexcused absence.
- If you forget to enter the code, the instructor will enter it for you once. After this, you will be counted as absent.
- Bonus questions and/or in-class work may be given out during lecture time. If a student is absent on a day that an such an assignment is given, they will not be awarded any points.
- For university-approved absences, it is the student's responsibility to contact the instructor promptly, or in advance when possible. Unexcused absences will be handled on a case-by-case basis.

    - The University policies can be found here: https://catalog.floridapoly.edu/content.php?catoid=24&navoid=1408#attendance
- 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.

In-class Work and Participation:
- Students are expected to participate in the classroom experience. In-class activities and group work may be done and will count towards 10% part of your overall grade.
- 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).
- Students who routinely do not bring materials to class that are required for participation, will not be given credit for class attendance and participation.

Homework:
- The weekly homework will be through Mastering Chemistry. Access will need to be purchased through the publisher or Bookstore.
- There will be a homework assignment due each Monday by 11:59 pm (see schedule below for all due dates, if there is no class on a Monday, the due date is pushed to Tuesday).
- The assignments will open on the Thursday prior to when they are due. Please see the "Late work" policy for more information on late homework.
- If you need assistance, just ask your instructor. If you are uncertain on what is expected at any time, please ask your instructor.

Exams:
- There are 3 exams and a final exam in this course. The first and third exam will be 50-minute exams taken during your scheduled lecture time. The midterm (second) exam will be a 90-minute exam and taken as a common exam in the evening.
- All exam dates are listed in the course schedule. Should a situation arise and anything need to be changed, you will be notified 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 on Canvas one week prior to the scheduled event, along with a study guide, formula sheet and anything else pertinent to the exam.
- You must bring a calculator to every exam.
- **Please note:** no electronic devices, besides an approved calculator, are permitted on exams. All cell phones and smart watches/other devices should be powered off and put away so that they are inaccessible during the exam. If a student has a phone or other smart device accessible during an exam, they will be recommended for an academic integrity investigation and will receive a zero on the exam.

- The date for the final exam will be announced once scheduled by the registrar. As with other exams, an announcement will be made with all information pertinent to the final.
- In order to pass this class, the final exam must be taken.
- The final exam grade may replace the lowest exam grade if it benefits the overall grade in the course. Note: All exams are required. **The final will not replace a 0 from a missed exam**.

Please note: 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.

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.

University Policies

Reasonable Accommodations

The University is committed to ensuring equal access to all educational opportunities. 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: DisabilityServices@floridapoly.edu; (863) 874-8770; 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 discuss resources and options available.

Academic Integrity

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 sanctions up to and including expulsion from the university.

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 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****.*

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.
- **Tutoring and Learning Center**: The Tutoring and Learning Center (The TLC) provides tutoring to all Florida Poly students who may need additional academic support. The TLC is staffed by students who have excelled in the courses they tutor. They offer support by reviewing concepts and materials from class, clarifying points of confusion and providing assistance with learning strategies. While the focus of TLC is to provide support to students in freshman-level courses, upper-level courses are also tutored at the Center. The TLC is located in the IST Commons (second floor).
    - **Knack Tutoring**: Students looking for additional assistance outside of the classroom are advised to consider working with a peer tutor through Knack. Florida Polytechnic University has partnered with Knack to provide students with access to verified peer tutors who have previously aced this course. To view available tutors, visit floridapoly.joinknack.com and sign in with your student account.

- **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.