

***** This document is subject to minor changes. *****

CHEM0100: Introduction to General Chemistry

Fall 2025

Instructor: Debjani Chakraborty, PhD**E-mail:** dec191@pitt.edu**Lecture:** Monday, Wednesday & Friday; 11.00 AM – 11.50 AM; Chevron 154**Office Hours:** Monday or Wednesday; 12.00 PM – 12.45 PM; Chevron 1303**COURSE OBJECTIVES:**

This non-lab, 3-credit course is designed to develop fundamental concepts, basic calculations, and problem-solving skills in General Chemistry. Topics include Measurement, Matter, Energy, Atoms, Elements, Molecules, Chemical Composition, Chemical Reactions, Stoichiometry, Periodic Properties of the Elements, and Chemical Bonding. A background in chemistry is not necessary while a fundamental knowledge of math is required and facility with basic algebraic concepts is recommended.

REQUIRED TEXT:

- Tro, Nivaldo J., “Introductory Chemistry”, 7th Edition (Chapters 1-10). You will have access to Mastering Chemistry for online homework.

OTHER RESOURCES:

- Lecture slides and supplementary material on select topics will be available through Canvas.
- Relevant chapter-end questions will be assigned as homework throughout the semester, posted through Mastering Chemistry. This is for your practice and to encourage you to work on other similar chapter-end problems.
- A study guide will be provided prior to each exam to help with your preparation. The answer key will be made available separately.
- You are encouraged to contact course instructor for any questions on lecture material, evaluation scheme and tests.
- We have scheduled Office Hours (ref. **Canvas Calendar**) to address your questions.
- Free tutoring is available. (<https://www.chem.pitt.edu/undergraduate/bachelor-science-chemistry/tutoring>)

LEARNING OBJECTIVES:**Chapter 1: The Chemical World**

Chemistry in everyday life; Application of the scientific method; Analysis and interpretation of scientific data.

Chapter 2: Measurement and Problem Solving

Representation of numbers in scientific notation; Significant figures; Base units and prefixes; Units conversion and conversion factors.

Chapter 3: Matter and Energy

Matter: solids, liquids, and gases; Atoms, molecules and ions; Elements and compounds; Types of mixtures; Physical and chemical properties; Physical and chemical changes; Law of conservation of mass; Different forms of energy; Specific heat capacity.

Chapter 4: Atoms and Elements

Atomic structure: electrons, protons and neutrons; Atomic number; Mendeleev's periodic table; Properties of elements; Ions; Isotopes.

Chapter 5: Molecules and Compounds

Joseph Proust's law of constant composition; Chemical nomenclature; Compounds and chemical formula; Empirical, molecular and structural formula; Formula mass calculation.

Chapter 6: Chemical Composition

Avogadro's number; Concept of moles in chemistry; Determining empirical formula.

Chapter 7: Chemical Reactions

Balancing chemical equations; Classification in chemical reactions; Redox reactions: oxidation number; Principles of solubility and precipitation; Molecular, ionic and net ionic equations.

Chapter 8: Quantities in Chemical Reactions

Limiting reactant and yield; Enthalpy: endothermic and exothermic reaction.

Chapter 9: Electrons in Atoms and the Periodic Table

Electromagnetic spectrum; Bohr model; Quantum-mechanical model: electron configuration and the periodic table; Periodic trends: electronegativity, ionization energy, atomic size, metallic property.

Chapter 10: Chemical Bonding

Ionic and covalent bonding; Lewis diagram: valence electrons and the octet rule.

EVALUATION/ SCORING:

Learning in this course will result primarily from lectures, discussions, homework and study guides. Students' progress will be evaluated on individual basis through in-class quizzes and exams. Final score/ letter grade will be calculated out of 500 points.

<i>Quiz 1</i>	Chapters 1-3	<i>50 pts</i>
<i>Quiz 2</i>	Chapters 8-9	<i>50 pts</i>
<i>Exam 1</i>	Chapters 1-4	<i>100 pts</i>
<i>Exam 2</i>	Chapters 5-7	<i>100 pts</i>
<i>Final Exam</i>	Chapters 1-10	<i>150 pts</i>
<i>Homework</i>	Chapters 1-10	<i>50 pts</i>

* **All homework must be completed by respective due dates to receive 50 points.**

* Exact dates and syllabi for quizzes will be announced a week prior.

* Details of exam policies and procedures will be announced in class.

* **Final Exam is semi-cumulative.**

* This course allows the use of a **non-programmable calculator** during exams/ quizzes.

* A re-grading process for the mid-term exams is available. To make it fair, **entire exam will be re-graded**, and your score may increase, remain the same, or decrease.

* **The class is typically curved after considering all the scores.**

QUIZ/ EXAM FORMAT:

- Quiz: Multiple Choice Questions.
- Exam: Multiple Choice Questions; True/False Questions; Short Answers Questions; Open-ended Questions.
- Exam/ Quiz will include both numerical and qualitative problems. Number of questions will vary.

EXAM SCHEDULE:

- Exam 1: October 03; 11:00 AM – 11:45 AM; Chevron 154
- Exam 2: November 07; 11:00 AM – 11:45 AM; Chevron 154
- **Final Exam: TBA (Final exam period, Dec. 08 - 12)**

ATTENDANCE:

You are expected to attend classes regularly. **You are responsible for all material discussed and announcements made in your absence.**

ACADEMIC INTEGRITY:

Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity (<http://www.as.pitt.edu/fac/policies/academic-integrity>). Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outlined in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

DISABILITY SERVICES:

If you have a disability that requires special testing accommodations or other classroom modifications, you need to notify both the instructor and Disability Resources and Services (<http://www.studentaffairs.pitt.edu/drs/welcome>) no later than the second week of the term. You may be asked to provide documentation of your disability to determine the appropriateness of accommodations. To notify Disability Resources and Services, call (412) 648-7890 (Voice or TTD) to schedule an appointment. The Disability Resources and Services office is located in 140 William Pitt Union on the Oakland campus.

DIVERSITY STATEMENT:

This course encourages free and critical thinking. I desire to facilitate an open and safe learning environment. Everyone should feel welcomed to share his/her views and questions. I am a firm believer in the importance of diversity in all scholarly activities such as education, teaching and research. It is my goal that students from all backgrounds and identities feel welcomed and well-served by this course. If you experience otherwise, please bring it to my attention as soon as possible so that we take proper steps. Additionally, please remember that the University of Pittsburgh does not tolerate any form of discrimination, harassment, or retaliation based on disability, race, color, religion, national origin, ancestry, genetic information, marital status, familial status, sex, age, sexual orientation, veteran status or gender identity or other factors as stated in the University's Title IX policy. The University is committed to taking prompt action to end a hostile environment that interferes with the University's mission. For more information about policies, procedures, and practices, see: <https://www.diversity.pitt.edu/civil-rights-title-ix-compliance/policies-procedures-and-practices>.