

**CHEM 1405**  
**Introduction to Chemistry**

**Western Texas College**

- I. Basic Course Information
  - A. Lecture—Survey course introducing chemistry. Topics may include inorganic, organic, biochemistry, food/physiological chemistry, and environmental/consumer chemistry. Designed for allied health students and for students who are not science majors.
  - B. Lab—the required laboratory activities will reinforce the lecture material.
  - C. Any required prerequisites: None
  - D. Required grade for enrolling in the next course in this sequence: Need a C or higher in CHEM 1405 in order to take CHEM 1407
- II. Student Learning Outcomes:
  - A. Lecture
  - B. Describe the scientific method
  - C. Be able to use dimensional analysis with proper unit and significant figures
  - D. Be able to Name and classification of inorganic and organic compounds
  - E. Illustrate the parts of an atom and ions
  - F. Portray the difference between an element, compound, and mixtures
  - G. Identify the different types of chemical bonds
  - H. Write and balance chemical equations
  - I. Complete stoichiometry-based calculations
  - J. Make sense of acids/bases, their reactions and how buffers work.
  - K. Write up redox reactions and their applications
- III. Lab
  - A. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
  - B. Demonstrate safe and proper handling of laboratory equipment and chemicals.
  - C. Conduct basic laboratory experiments with proper laboratory techniques.
  - D. Complete careful and accurate experimental observations.
  - E. Interpret laboratory results and experimental data, and reach logical conclusions.
  - F. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
- IV. Testing Requirements
  - A. Campus
    - 1. Students are not allowed to use their book or notes of any kind while taking their proctored tests and exams. A periodic table will be provided.
    - 2. Students are allowed to use a calculator.
  - B. Online

1. The midterm and final exam must be proctored by an approved testing organization. (Ask your instructor for more details.)
  2. Students are not allowed to use their book or notes of any kind while taking their proctored tests and exams. A periodic table will be provided.
  3. Students are allowed to use a calculator.
- V. Course Requirements
- A. Campus/Online
    1. Lecture: homework assignments; weekly quizzes; midterm and final exam
    2. Lab: lab reports; final exam
    3. Quizzes and exams are timed.
- VI. Information on Books and Other Course Materials
- A. Required Book: Introductory Chemistry w/Mastering Chemistry, 6th Edition. Tro. 2018. Pearson Prentice Hall. (ISBN:) 9780134290812
  - B. Required Access Code: MasteringChemistry access code is bundled with book.
  - C. Required Lab Kit: Intro Chemistry Custom Lab Kit. Hands On Learning. (SKU: Kit LP-**2820**-CK-02) (ISBN: 2818560391975) **Please contact the WTC bookstore to purchase the kit.**
  - D. Required Calculators: scientific calculator
  - E. Recommended: Quick Study Academic: Chemistry. Jackson, Mark. D. (ISBN: 978-142321859-3)
  - F. Recommended: Quick Study Academic: Chemistry Equations & Answers. Jackson, Mark. D. (ISBN: 978-142320189-2)
- VII. Grading Breakdown:
- A. Campus/Online
 

Lecture Homework	10%
Lecture Quizzes	10%
Lecture Midterm	25%
Lecture Final Exam	25%
Lab Reports	15%
Lab Final Exam	15%
  - B. A final semester grade will be based as follows:
    - A = 89.5% and above
    - B = 79.5 – 89.49
    - C = 69.5 – 79.49
    - D = 59.5 – 69.49
    - F = 59.49% and below
    - I = Incomplete (failure to complete the requirements of the course)
- VIII. Other Policies, Procedures and important dates. Please refer to the WTC [Catalog](#) for the following:

- B. Campus Calendar
- C. Final exam schedule
- D. How to drop a class
- E. Withdrawal information
- F. Student Conduct/Academic Integrity
- G. Students with disabilities

IX. Course Content

Chapter 1: Chemical World	Learn how to look, study, and view the world around them.
Chapter 2: Measurement and Problem Solving	<p>Scientific Notation: Writing Large and Small Numbers</p> <p>Significant Figures: Writing Numbers to Reflect Precision</p> <p>Significant Figures in Calculations</p> <p>The Basic Units of Measurement</p> <p>Problem Solving and Unit Conversion</p> <p>Solving Multistep Unit Conversion Problems</p> <p>Unit Conversion in Both the Numerator and Denominator</p> <p>Units Raised to a Power</p> <p>Density</p> <p>Numerical Problem-Solving Strategies and the Solution map</p>
Chapter 3: Matter and Energy	<p>What is Matter?</p> <p>Classifying Matter According to Solid, Liquid, and Gas</p> <p>Classifying Matter According to Composition of Elements, Compounds, and Mixtures</p>
Chapter 4: Atoms and Elements	<p>Indivisible: The Atomic Theory</p> <p>The Nuclear Atom</p> <p>The Properties of Protons, Neutrons, and Electrons</p> <p>Elements: Defined by Their Numbers of Protons</p> <p>Looking for Patterns: The Periodic Law and the Periodic Table</p> <p>Ions: Losing and Gaining Electrons</p>
Chapter 5: Molecules and Compounds	<p>Compounds Display Constant Composition</p> <p>Chemical Formulas: How to Represent Compounds</p> <p>A Molecular View of Elements and Compounds</p> <p>Writing Formulas for Ionic Compounds</p> <p>Naming various Compounds</p> <p>Formula Mass: The Mass of a Molecule or Formula Unit</p>
Chapter 6: Chemical Composition	<p>Counting Nails by the Pound</p> <p>Counting Atoms by the Gram</p> <p>Counting Molecules by the Gram</p> <p>Chemical Formulas as Conversion Factors</p>

Chapter 7: Chemical Reactions	Evidence of a Chemical Reaction The Chemical Equation How to Write and Balanced Chemical Equations Classifying Chemical Reactions
Chapter 8: Quantities in Chemical Reactions	Making Pancakes: Relationships between Ingredients Making Molecules: Mole-to-Mole Conversions Making Molecules: Mass-to-Mass Conversions
Chapter 10: Chemical Bonding	Representing Valence Electrons with Dots Lewis Structures of Ionic Compounds: Electrons Transferred Covalent Lewis Structures: Electrons Shared Writing Lewis Structures for Covalent Compounds
Chapter 14: Acids and Bases	Properties of acids and bases Bases: Properties and examples The pH and pOH scale: ways to express acidity and Basicity Buffers: Solutions that resist pH Change.
Chapter 16: Oxidation and reduction	Oxidation and reduction: Oxidation States: Bookkeeping The Activity series: Predicting Spontaneous Redox reactions Batteries: Using chemistry to generate electricity Electrolysis: Using electricity to do chemistry Corrosion: Undesirable redox reactions
Chapter 18: Organic Chemistry	Difference between inorganic and organic chemistry Hydrocarbons: Compound containing only carbons and hydrocarbons Identifying elements of organic chemistry

Last Modified: November 15, 2019