

**JAMESTOWN COMMUNITY COLLEGE**  
**State University of New York**

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**INSTITUTIONAL COURSE SYLLABUS**

**Course Title:** Introduction to Chemistry

**Course Abbreviation and Number:** CHE 1500

**Credit Hours:** 3

**Course Type:** Lecture

**Course Description:** Students will investigate fundamental concepts of chemistry from a theoretical approach using basic scientific tools of measurement and problem solving. Topics include atomic structure, nomenclature, bonding, periodic behavior, chemical equations, acids and bases, gases, liquids, solids, and properties of solutions. The course is for students with little or no chemistry background and/or who wish to continue in CHE 1550.

**Prerequisite/Corequisite:** ENG 1510; **Eligibility:** college level math (or prerequisite/corequisite MAT 0550).

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**General Education Requirements Met**

**SUNY**

Natural Sciences

**JCC**

Scientific Reasoning

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**Student Learning Outcomes:**

Students who demonstrate understanding can:

1. Demonstrate an understanding of the methods scientists use to explore natural phenomena, including observation, hypotheses development, measurement and data collection, experimentation, evaluation of evidence, and employment of data analysis or mathematical modeling. [SUNY Gen Ed – Natural Sciences]
  2. Application of scientific data, concepts, and models in one of the natural sciences. [SUNY Gen Ed – Natural Sciences]
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**Topics Covered:**

- **Chemistry the Study of Matter**
  - Classification of matter
  - Physical and chemical change
  - Metric system and conversions
  - Dimensional analysis
  - Density
- **The Structure of the Atom**
  - Development of theories of the atom and its structure
  - Arrangement of electrons in the atom
  - Electron configurations
  - Bohr model compared to quantum model
  - Understanding the periodic table in terms of electron configurations
  - Symbols used to represent isotopes
  - Average atomic mass
  - Octet rule
  - Electron dot notations
- **Bonding**
  - Ionic bonding
  - Electronegativity
  - Covalent bonding
    - non polar, polar
  - Shapes of molecules and determination if the substance is polar or non-polar
  - Intermolecular forces and states of matter
  - Naming and writing formulas (for: elements, simple ions, binary ionic compounds, binary covalent compounds, compounds containing polyatomic ions)
- **Mathematics of Chemistry**
  - Writing and balancing equations
  - Gases and gas laws.
  - Avogadro's Number (and related conversions)
  - Stoichiometry
    - mole-mole, mole-mass, mass-mass, mass-volume, volume-volume

- **Chemistry of Water**
    - Special properties of water and hydrogen bonding
    - Expressing the concentration of a solution
      - qualitative description, grams solute/100 g water, percent concentration, molarity, ppm
    - Electrolytes and nonelectrolytes
    - Osmosis
    - Hypertonic, hypotonic, and isotonic solutions
    - Solubility's rule: like dissolves like
  - **Acids, Bases and Salts**
    - Acid and base theories: Arrhenius, Bronsted-Lowry, Lewis
    - pH
    - Properties of acids and bases
    - Common acids and bases: names, formulas, and occurrences
  - **Redox**
    - Determining if a substance is oxidized or reduced in a reaction
    - Identification of the oxidizing agent and the reducing agent in a reaction
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### Information for Students

- Expectations of Students
    - [Civility Statement](#)
    - [Student Responsibility Statement](#)
    - [Academic Integrity Statement](#)
  - [Accessibility Services](#)  
 Students who require accommodations to complete the requirements and expectations of this course because of a disability must make their accommodation requests to the Accessibility Services Coordinator.
  - [Get Help: JCC & Community Resources](#)
  - [Emergency Closing Procedures](#)
  - Course grade is determined by the instructor based on a combination of factors, including but not limited to, homework, quizzes, exams, projects, and participation. Final course grade can be translated into a grade point value according to the following:
 

A=4.0	B+=3.5	B=3	C+=2.5	C=2	D+=1.5	D=1	F=0
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  - Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, VA appointments) are welcome and encouraged to communicate these to the instructor.
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**Effective Date:** Fall 2023