**COLLIN COLLEGE**

**COURSE SYLLABUS**

Course Information

**Course Number:** CHEM 1411

**Course Title:** General Chemistry I

**Course Description:**

Lecture: Fundamental principles of chemistry for majors in the sciences, health sciences, and engineering; topics include measurements, fundamental properties of matter, states of matter, chemical reactions, chemical stoichiometry, periodicity of elemental properties, atomic structure, chemical bonding, molecular structure, solutions, properties of gases, and an introduction to thermodynamics and descriptive chemistry.

Lab: Basic laboratory experiments supporting theoretical principles presented in CHEM 1311; introduction of the scientific method, experimental design, data collection and analysis, and preparation of laboratory reports. High school chemistry is strongly recommended.

**Course Credit Hours:** 4

Lecture Hours: 3

Lab Hours: 3

Recitation: 1

**Prerequisite:** MATH 1314 equivalent or higher level within the last 5 years with a grade of "C" or better, and meet TSI college-readiness standard for Reading and Writing; or equivalent

**Student Learning Outcomes:**

* **State-mandated Outcomes:** Upon successful completion of this course, students will:

Lecture

1. Define the fundamental properties of matter.
2. Classify matter, compounds, and chemical reactions.
3. Determine the basic nuclear and electronic structure of atoms.
4. Identify trends in chemical and physical properties of the elements using the Periodic Table.
5. Describe the bonding in and the shape of simple molecules and ions.
6. Solve stoichiometric problems.
7. Write chemical formulas.
8. Write and balance equations.
9. Use the rules of nomenclature to name chemical compounds.
10. Define the types and characteristics of chemical reactions.
11. Use the gas laws and basics of the Kinetic Molecular Theory to solve gas problems.
12. Determine the role of energy in physical changes and chemical reactions.
13. Convert units of measure and demonstrate dimensional analysis skills.

Lab

1. Use basic apparatus and apply experimental methodologies used in the chemistry laboratory.
2. Demonstrate safe and proper handling of laboratory equipment and chemicals.
3. Conduct basic laboratory experiments with proper laboratory techniques.
4. Make careful and accurate experimental observations.
5. Relate physical observations and measurements to theoretical principles.
6. Interpret laboratory results and experimental data, and reach logical conclusions.
7. Record experimental work completely and accurately in laboratory notebooks and communicate experimental results clearly in written reports.
8. Design fundamental experiments involving principles of chemistry.
9. Identify appropriate sources of information for conducting laboratory experiments involving principles of chemistry.

* **Additional Collin Outcomes:** Upon successful completion of this course, students will:

1. Using critical thinking, explain and describe qualitatively, quantitatively and symbolically chemical compounds (including formulas and names) and different types of chemical reactions. (Critical Thinking; Communication Skills; Empirical/Quantitative Skills)
2. Determine and explain types of bonding, molecular geometry, bond strength, and polarity. (Communication Skills; Empirical/Quantitative Skills)
3. Apply different atomic theories and models to predict and explain periodic trends. (Critical Thinking; Empirical/Quantitative Skills)
4. Qualitatively and quantitatively describe properties of matter in terms of states and classification (pure vs. mixture). (Empirical/Quantitative Skills)
5. Use laws of thermodynamics critically to qualitatively and quantitatively express heat changes associated with different processes. (Critical Thinking; Empirical/Quantitative Skills)
6. Safely work in teams in the laboratory to collect data (both electronically and manually), make measurements, make observations and conduct reactions; qualitatively and quantitatively and critically analyze lab data and communicate results using both written and electronic formats. (Critical Thinking; Communication Skills; Empirical/Quantitative Skills; Teamwork)

**Withdrawal Policy:** See the current *Collin Registration Guide* for last day to withdraw.

**Collin College Academic Policies:** See the current *Collin Student Handbook.*

**Americans with Disabilities Act Statement:** Collin College will adhere to all applicable federal, state and local laws, regulations and guidelines with respect to providing reasonable accommodations as required to afford equal educational opportunity. It is the student’s responsibility to contact the ACCESS office, SCC-D140 or 972.881.5898 (V/TTD: 972.881.5950) to arrange for appropriate accommodations. See the current *Collin Student Handbook* for additional information.

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