



**CHEMISTRY 1311/ GENERAL CHEMISTRY I
MW: 5:40 P.M. - 6:55 P.M.**

GENERIC COURSE LECTURE SYLLABUS

SPRING

SECTION NUMBER: Sections #s.

SYNONYMS: Synonyms.

PROFESSOR'S NAME: Kamil A. Jbeily, Ph.D.

PHONE NUMBER: 223-1795 Extension 22248# (For expedient response, use E-mail)

E-MAIL ADDRESS: kjbeily@mail.utexas.edu

OFFICE HOURS AND LOCATION: Wednesdays 4:40 p.m. – 5:40 p.m.; RGC 319

COURSE DESCRIPTION: General Chemistry I covers the fundamental facts, laws, principles, theories, and concepts of chemistry necessary for further work in science or science-related subjects. Stresses atomic structure, periodic properties of matter, chemical bonding, and molecular geometry of organic and inorganic molecules, states of matter, stoichiometry, and properties of solutions. Prerequisites: One year of high school chemistry or CHEM 1305; two years of high school algebra or MATD 0390.

REQUIRED TEXTS/MATERIALS: Lecture: Chemistry the Central Science, 11th ed., Brown, LeMay, Burton & Murphy; Lecture Homework Notebook; Lab: Chemical Principles in the Laboratory, Slowinski, et.al.

INSTRUCTIONAL METHODOLOGY: This course consists of a lecture and a laboratory section. Lecture format, interactive, with individual student and group participation in class work

COURSE RATIONALE: This course covers the fundamental facts, laws, principles, theories and concepts of chemistry necessary for further work in science or science-related subjects.

COMMON COURSE OBJECTIVES: Common course objectives are attached. They can also be found at: <http://www2.austin.cc.tx.us/chem/curriculum/index.htm>

COURSE EVALUAION/GRADING SYSTEM: The lecture grade is separate from the lab grade.

TESTS: Tests will cover all materials discussed in class, as well as reading and homework assignments related to those materials. Tests will be taken in class on each of the following dates:

Test 1	FEBRUARY	Test 2	MARCH
Test 3 & Exit Exam	MAY	Comprehensive Final	MAY

These test dates are very important dates, so mark your calendar for frequent reference and reminder. The Comprehensive Final is designed to replace a test for which a student is absent for a justifiable reason and for which no other special arrangements were possible. Such reason and justification must be discussed with the instructor ahead of time. The Comprehensive Final is NOT designed to replace a low-score test! Test Three including the Exit Exam will be to some extent comprehensive, covering exit exam materials that have been deemed fundamental and essential by the college chemistry task force.

To achieve well in this course, students are expected to attend class regularly and complete reading assignments and all homework problems.

GRADING: Each lecture test, including "Test Three & Exit Exam" is worth 100 points. The average of all lecture tests will yield final total course grade. The lab grade will be calculated based on performance on a number of experiments/assignments, each of which is worth 100 points, plus performance on Final Lab Quiz. Grades will be assigned as follows:

- A 90 - 100%
- B 80 - 89%
- C 70 - 79%
- D 60 - 69%
- F 0 - 59%

COURSE POLICIES: *Missed Exams:* Special arrangements will be made with the instructor for missed exams.

Attendance: Attendance is not required. However, to achieve well in this course, students are expected to attend class regularly and complete reading assignments and all homework problems, and participate in class by volunteering to solve problems and answer questions.

Withdrawal: Professor will **NOT** withdraw students. **Withdrawal is the student's responsibility.**

Incomplete: No incomplete will be granted except in extreme emergencies and after completion of the majority of assignments and tests.

Scholastic Dishonesty: Acts prohibited by the college for which discipline may be administered include scholastic dishonesty, including but not limited to cheating on an exam or quiz, plagiarizing, and unauthorized collaboration with another in preparing outside work. Academic work submitted by students shall be the result of their thought, research or self-expression. Academic work is defined as, but not limited to tests, quizzes, whether taken electronically or on paper; projects, either individual or group; classroom presentations, and homework.

Academic Freedom: "Institutions of higher education are conducted for the common good. The common good depends upon a search for truth and upon free expression. In this course the professor and students shall strive to protect free inquiry and the open exchange of facts, ideas, and opinions. Students are free to take exception to views offered in this course and to reserve judgment about debatable issues. Grades will not be affected by personal views. With this freedom comes the responsibility of civility and a respect for a diversity of ideas and opinions. This means that students must take turns speaking, listen to others speak without interruption, and refrain from name-calling or other personal attacks."

Student Discipline Policy: "Students at the College have the rights accorded to all persons under the Constitution to freedom of speech, peaceful assembly, petition, and association. These rights carry with them the responsibility for each individual to accord the same rights to others in the College community and not to interfere with or disrupt the educational process. As willing partners in learning, it is expected that students will comply with College rules and procedures. ACC students are recognized as responsible persons who neither lose the rights nor escape the responsibilities of citizenship. Enrollment in the College indicates acceptance of the rules set forth in this policy, administered through the office of the Campus Dean of Student Services. Due process, through an investigation and appeal process, is assured to any student involved in disciplinary action."

Students with Disabilities: Each ACC campus offers support services for students with documented physical or psychological disabilities. Students with disabilities must request reasonable accommodations

through the Office for Students with Disabilities on the campus where they expect to take the majority of their classes. Students are encouraged to do so three weeks before the start of the semester.

“Students who are requesting accommodation must provide the instructor with a letter of accommodation from the Office of Students with Disabilities (OSD) at the beginning of the semester. Accommodations can only be made after the instructor receives the letter of accommodation from OSD.”

COURSE OUTLINE: The following will be the chronological sequence of instruction. Any deviation from this sequence will be discussed in class:

Unit I	Introduction and Foundations of Chemistry Matter and Energy; Measurement; Heat and Temperature Chemical Formulas and Composition Stoichiometry; Atoms, Molecules, and Ions Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapters 1&2;
Unit II	Chemical Equations and Reaction Stoichiometry Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapters 2&3
Unit III	Some Types of Chemical Reactions; Oxidation Numbers; Introduction to Reactions in Aqueous Solution Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapter 4
Unit IV	Heat Transfer/Calorimetry Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapters 1 & Chapter 5 (Sections 5.3, 5.4 5.5, & 5.7)
Unit V	Structure of Atoms; Electronic Structure of Atoms; Chemical Periodicity and Periodic Properties Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapters 6 & 7
Unit VI	Chemical Bonding: Ionic and Covalent Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapter 8
Unit VII	Molecular Structure and Geometry Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapters 9
Unit VIII	Gases and The Kinetic-Molecular Theory Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapter 10
Unit IX	Liquids, Solids, Intermolecular Forces Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapter 11
Unit X	Properties of Solutions Reactions in Aqueous Solutions Acids and Bases Supporting Reading Assignments: Chemistry the Central Science, 11 th ed., Brown, LeMay, Burton & Murphy; Chapters 4 & 13

STUDENT SERVICES:

The web address for student services is: <http://www.austincc.edu/rss/index.htm>.

The ACC student handbook can be found at: <http://www.austincc.edu/handbook/>.

INSTRUCTIONAL SERVICES:

The web address is: <http://www.austincc.edu/faculty/newsemester/>, then click on “Campus Based Student Support Overview”.

Objectives for CHEM 1411 General Chemistry I

This is a list of topics taught in General Chemistry I. The list does not reflect the order in which the topic is taught.

The Foundation of Chemistry

Matter and Energy-Basic Concepts of Chemistry
Measurements
Significant Figures
Metric System
Scientific Notation
Dimensional Analysis

Chemical Formulas and Stoichiometry

Atoms, Ions, Molecules and Compounds
Nomenclature of Inorganic Compounds
The Mole Concept
Percent Composition
Empirical Formula
Molecular Formula

Chemical Equations and Reaction Stoichiometry

Balancing of Chemical Equations
Calculations Based on Chemical Equations-moles/masses of reactants/products
Limiting Reagent Calculations
Percent Yield and Theoretical Yield Calculations
Sequential Reactions
Concentration of Solutions-Calculations Involving Mass % and Molarity
Dilution of Solutions: Calculations Involving $V_1M_1=V_2M_2$
Calculations Involving Solution Stoichiometry

Chemical Reactions

Organization of the Periodic Table
Aqueous Solutions-Strong and Weak Electrolytes
Reactions in Aqueous Solutions
Oxidation Numbers

The Structure of the Atom

Experiments that led to the discovery of the fundamental particles of the atom
Subatomic Particles, Isotopes, Atomic Weight
Development of Quantum Mechanics
Quantum Mechanical Model of the Atom
Electronic Configuration and the Relationship to the Periodic Table
Orbital Diagrams
Quantum Numbers
Chemical Periodicity

Theory of Ionic and Covalent Bonding

Lewis Dot Formulas of Atoms

Formation of Binary Ionic Compounds-Coulomb's Law, Lattice Energy

Formation of Covalent Compounds

Lewis Structures for Molecules and Polyatomic Ions and the Octet Rule

Resonance and Formal Charges

Exceptions to the Octet Rule for Lewis Structures

Polar and Nonpolar Covalent Bonds

Molecular Structure

Valence Shell Electron Pair Repulsion Theory (VSEPR)

Electronic and Molecular Geometry and Molecular Dipole Moments

Valence Bond Theory and Hybridization of Orbitals

Molecular Orbital Theory

Gases

Gas Laws and Ideal Gas Law

Density and Molar Mass

Stoichiometry of Reactions Involving Gases

Kinetic Molecular Theory-Molecular Speeds

Real Gases

Liquids and Solids

Intermolecular Attractions and Phase Changes

Physical Processes and Properties of Liquids

Melting Point/Boiling Point

Phase Changes of Matter and Phase Diagrams

Molar Heat of Vaporization and Molar Heat of Fusion

Solutions

Dissolution Process for Solids, Liquids and Gases

Factors Affecting Solubility

Saturated, Unsaturated and Supersaturated Solutions

Other Units of Concentration

Colligative Properties

1. Vapor Pressure Lowering
2. Boiling Point Elevation
3. Freezing Point Depression
4. Osmotic Pressure