



CHEM 1311 – General Chemistry I
Course Syllabus

Effective Date: Fall 2011

I. Course Number: CHEM 1311

II. Course Title: General Chemistry I

III. Semester Credit Hours: 3

IV. Course Description: 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.

Co-requisite: CHEM 1111 – General Chemistry I Laboratory.

Prerequisites: MATH 1314 – College Algebra or equivalent academic preparation; High school chemistry is strongly recommended.

V. Course Delivery Method: Face-to-face

VI. Required Textbooks/Resources: GENERAL CHEMISTRY: Principles and Modern Applications by R. H. Petrucci, et al., (10th Edition), Pearson Education Inc., 2007. (ISBN-10: 0136121497, ISBN-13: 9780136121497)

VII. Student Learning Outcomes: The Texas Higher Education Board adopted Exemplary Education Objectives (EEOs) to establish a common knowledge thread through the course taught within Texas Core curriculum. The Natural Sciences EEOs are integrated into the Student Learning Outcomes below:

- Understand and apply method and appropriate technology to the study of natural sciences by satisfactorily applying the scientific method to a research scenario provided by the professor. (EEOs 1)
- Recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry

and to communicate findings, analyses, and interpretation both orally and in writing. (EEOs 2)

- Demonstrate knowledge of the major issues and problems facing modern science, including issues that touch upon ethics, values, and public policies. The student will demonstrate proficiency with satisfactory grades on an essay on a chemistry related topic of their choice. (EEOs 4)
- Demonstrate knowledge of the interdependence of science and technology and their influence on, and contribution to, modern culture. (EEOs 5)

Upon successful completion of this course, students will:

1. Define the fundamental properties of matter; classify matter, compounds, and chemical reactions; convert units of measure and demonstrate dimensional analysis skills.
2. Determine the basic nuclear and electronic structure of atoms; identify trends in chemical and physical properties of the elements using the Periodic Table; describe the bonding in and the shape of simple molecules and ions.
3. Solve stoichiometric problems; write chemical formulas; write and balance equations; use the rules of nomenclature to name chemical compounds; define the types and characteristics of chemical reactions.
4. Use the gas laws and basics of the Kinetic Molecular Theory to solve gas problems; determine the role of energy in physical changes and chemical reactions.

VIII. Course Outline: General Chemistry I is the first semester of a one-year course. The first semester covers the following topics and subtopics:

1. Matter: Properties of Matter, Classification of Matter, Measurements of Matter, Density and Percent Composition, Uncertainties in Scientific Measurements, Significant Figures;
2. Atoms and the Atomic Theory: The Atomic Theory, The Nuclear Atom, Chemical Elements, Atomic Mass, Introduction to the Periodic Table, The Concept of the Mole and the Avogadro Constant, Using the Mole Concept in Calculations;
3. Electrons in Atoms: Electromagnetic Radiation, Atomic Spectra, Quantum Numbers and Electron Orbitals, Interpreting and Representing the Orbitals of the Hydrogen Atom, Electron Spin, Multielectron Atoms, Electron Configurations, Electron Configurations and the Periodic Table;
4. The Periodic Table and Some Atomic Properties: The Periodic Law and the Periodic Table, Metals and Nonmetals and Their Ions, Size of Atoms

and Ions, Ionization Energy, Electron Affinity, Magnetic Properties, Periodic Properties of the Elements;

5. Chemical Bonding: Lewis Theory and Covalent Bonding, Writing Lewis Structures, Resonance, Exceptions to the Octet Rule, Shapes of Molecules, Bond Order and Bond Length;

6. Chemical Compounds: Types of Chemical Compounds and Their Formulas, The Mole Concept and Chemical Compounds, Composition of Chemical Compounds, Oxidation States, Naming Organic and Inorganic Compounds;

7. Chemical Reactions: Chemical Reactions and Chemical Equations, Chemical Equations and Stoichiometry, Chemical Reactions in Solution, Determining the Limiting Reactant;

8. Gases: The Simple Gas Laws, The Ideal Gas Equation, Applications of the Ideal Gas Equation, Gases in Chemical Reactions, Mixtures of Gases, Kinetic-Molecular Theory of Gases, Gas Properties Relating to the Kinetic-Molecular Theory, Nonideal Gases;

9. Thermochemistry: Heat, Calorimetry, Work, The First Law of Thermodynamics, Heats of Reaction, Hess's Law, Standard Enthalpies of Formation.

IX. Methods of Evaluation: Students will demonstrate successful outcomes by earning 70% or higher on six unit tests, one per major unit of study, and on the comprehensive final exam. Unit tests will be composed of fill in the blank and open-ended format problems. The comprehensive exam will be composed of multiple choice questions relating to all content cover in the course. Each student's final grade will be based on the following:

Graded Components	Points
Unit Tests (6 @ 100 points each)	600
Comprehensive Final Exam	200
Total Possible Points	800

X. Grading Scale:

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

XI. Student Participation:

a. Participation Policy: Participation in the course will include attendance at all scheduled meetings, in class problem solving and collaboration with other students in a group at assigned stations. The collaboration involves implementation of theoretical knowledge into problem solving practice.

b. Course Etiquette: Informal class participation is welcome. Please do not make comments that are off the subject or that impede the progress of the class. Cell phones are to be turned off. Use the facilities before coming to class.

XII. Disability Accommodations: Students with disabilities may request reasonable accommodations through the A&M-Texarkana Disability Services Office by calling 903-223-3062.

XIII. Academic Integrity: Academic honesty is expected of students enrolled in this course. Cheating on examinations, unauthorized collaboration, falsification of research data, plagiarism, and undocumented use of materials from any source constitute academic dishonesty and may be grounds for a grade of 'F' in the course and/or disciplinary actions. For additional information, see the university catalog.

XIV. A&M-Texarkana Email Address: Upon application to Texas A&M University-Texarkana an individual will be assigned an A&M-Texarkana email account. This email account will be used to deliver official university correspondence. Each individual is responsible for information sent and received via the university email account and is expected to check the official A&M-Texarkana email account on a frequent and consistent basis. Faculty and students are required to utilize the university email account when communicating about coursework.

XV. University Drop Policy: To drop this course after the 12th class day, a student must complete the *Drop/Withdrawal Request Form*, located on the University website (<http://tamut.edu/Registrar/droppingwithdrawing-from-classes.html>) or obtained in the Registrar's Office. The student must submit the signed and completed form to the instructor of each course indicated on the form to be dropped for his/her signature. The signature is not an "approval" to drop, but rather confirmation that the student has discussed the drop/withdrawal with the faculty member. The form must be submitted to the Registrar's office for processing in person, email (Registrar@tamut.edu), mail (P. O. Box 5518, Texarkana, TX 75505) or fax (903-223-3140). Drop/withdraw forms missing any of the required information will not be accepted by the Registrar's Office for processing. It is the student's responsibility to ensure that the form is completed properly before submission. If a student stops participating in class (attending and submitting assignments) but does not complete and submit the drop/withdrawal form, a final grade based on work completed as outlined in the syllabus will be assigned.

XVI. Student Technical Assistance for Blackboard

- Solutions to common problems and FAQ's for your online course are found at this link: <http://www.tamut.edu/webcourses/index.php?pageid=37>

- If you cannot find your resolution there you can send in a support request detailing your specific problem here: <http://www.tamut.edu/webcourses/gethelp2.php>
- Blackboard Helpdesk contacts:
Office hours are M-F, 8:00a to 5:00p
Kevin Williams (main contact) 903-223-1356 kevin.williams@tamut.edu
Frank Miller (back-up) 903-223-3156 frank.miller@tamut.edu
Nikki Thomson (back-up) 903-223-3083 nikki.thomson@tamut.edu

XVII. Technical Requirements

Minimum Systems Requirements

The following computer system requirements are recommended for an online course:

OS: Windows 2000/XP/Vista, Mac OSX 10.2 and above

RAM: 256 MB, Processor: 2.0 GHz, Free Space on HDD: 500 MB

Internet Connection: (Broadband/DSL preferred), Dial Up 56k minimum

Browser: Internet Explorer 6 or 7, Mozilla Firefox 2.0, Safari 1.0

Java: Version 6 Update 11 or later

Sound card and speakers

Software Requirements

Pop-Up Blockers

All pop-up blockers installed on your computer must be set to allow pop-ups from Blackboard/WebCT

Java Runtime Environment

You must have the Java Runtime Environment installed. This is a free plugin for your browser that can be obtained by going to <http://www.java.com>

Additional Plugins

You may need additional software based on the content that your instructor posts in their course. Commonly needed applications are:

Microsoft Office 2007/2003/XP Suite/Works (not free software)

Adobe Acrobat Reader (Free Download)

Windows Media Player (Free Download)

Real Time Media Player (Free Download)

Quick Time Media Player (Free Download)

Macromedia/Adobe Flash (Free Download)

Macromedia/Adobe Shockwave (Free Download)

CHEM 1311 – General Chemistry

Fall 2011

Course Schedule*

Date	Topic	Resources	Other
08/29/11	Matter – introduction to chemistry, measurement of matter	Chapter 1, Appendix C	
08/31/11	Matter – physical properties, measurement conversions	Appendix A,	
09/05/11			Labor Day – No class
09/07/11	Matter – the mole	Chapter 2.7	Last day to drop a course without receiving a grade full term (09/08/11)
09/12/11	Matter – pure substances, mixtures and solutions	Chapter 1	
09/14/11	Matter - Review		
09/19/11	Energy – phase changes, heat of vaporization, heat of fusion	Chapter 7	Exam I (Matter)
09/21/11	Energy – thermodynamics, types of energy	Chapter 7	
09/26/11	Energy – heat of composition	Chapter 7	
09/28/11	Energy - Review		
10/03/11	Atom - Nucleus	Chapter 2, webelements.com, Table D.5	Exam II (Energy)
10/05/11	Atom – Bohr Model, Valence Electons	Chapter 8	
10/10/11	Atom – Quantum Mechanics, Electron Configuration	Chapter 8	

10/12/11	Atom – Periodic Properties	Chapter 9	
10/17/11	Atom - Review		
10/19/11	Compounds – Law of Definite Proportions, Types of Bonds	Chapters 3, 10, and 11	Exam III (Atom)
10/24/11	Compounds – Naming and Writing Compounds	Chapters 3 and 10, nomenclature flowchart	
10/26/11	Compounds – Intermolecular Forces	Chapter 12	
10/31/11	Compounds – Shapes of Molecules and Ions	Chapter 10, jmol.org	
11/02/11	Compounds - Review		
11/07/11	Reactions – Law of Conservation of Mass, Types of Reactions	Chapter 4	Exam IV (Compounds)
11/09/11	Reactions – Balancing Reactions	Chapter 4, chembalancer	
11/14/11	Reactions – Stoichiometry, Determining Limiting Reagent	Chapter 4	
11/16/11	Reactions – Chemical Reactions in Solutions	Chapter 4	
11/21/11	Reactions - Review		
11/23/11	Gases – Kinetic Molecular Theory of Gases	Chapter 6	Exam V (Reactions)
11/28/11	Gases – Gas Laws	Chapter 6, virtual gas lab	Last day to drop or withdraw from Fall Term
11/30/11	Gases – Gases in Chemical Reactions	Chapter 6	

12/05/11	Gases - Review		
12/07/11	Thermochemistry – Heats of Reaction, Hess' Law	Chapter 19, Appendix D	Exam VI (Gases)
12/12/11	Review		
12/14/11	Final Exam		

*Tentative course schedule; subject to change