

Office of Academic Affairs  
Tarleton State University  
July, 2009

Master Course Syllabus Outline

Department: Chemistry and Geosciences Course Prefix/Number: Chem 1034

Official Course Title: Fundamentals of Chemistry

Master Syllabus Approved by Department on: \_\_\_\_/\_\_\_\_/\_\_\_\_  
month date year

I. Catalog Description (50 words; brief synopsis of course content, emphases)

A beginning chemistry course for students in applied sciences who need only one semester of general chemistry. The course includes structure, properties and changes in matter, quantitative relationships in reactions, solutions, equilibrium, pH, buffers and nuclear chemistry. Not recommended for science majors or preprofessional students in health fields. Does not meet prerequisite for CHEM 1084 or 2014.

II. Prerequisites?

None. However it is recommended that the student should have successfully completed MATH 1013 or higher.

III. Expanded Course Description (150 words; primary course content, intended student level and role(s) course is to play in the curriculum)

Topics to be covered include an introduction to fundamental chemical laws, Scientific Method and measurement, atomic structure and its relationship to chemical bonding and the periodic properties of elements and compounds, stoichiometry, states of matter, and solutions.

This course is suggested for the student who needs an introduction to the applied sciences and who needs one semester of general chemistry. This course is not a prerequisite for any higher chemistry course.

The course consists of three (3) lecture hours per week and three (2) laboratory hours per week for three (3) hours of college credit.

- IV. Intended Student Learning Outcomes? Required; **knowledge outcomes** (what students who successfully complete the course will be expected to know). Optional; **skill outcomes** (what students who successfully complete the course will be able to do). Optional; **value outcomes** (what students who successfully complete the course will value or appreciate).

### **Knowledge outcomes**

Upon completion of this course:

At least 70% of the students will show a grasp of the basic concepts of chemistry (e.g. scientific method, measurements, problem solving, atoms, atomic structure, nomenclature, chemical formulas, chemical equations, chemical bonding, gases, solutions, acids, bases, chemical equilibrium, oxidation, reduction, radioactivity, nuclear composition, organic chemistry, and biochemistry)

At least 70% of the students will show a grasp of the application of chemical concepts to the real world environment. (e.g. significant figures, units of measurement, conversion factors, states of matter, nomenclature, formula mass, chemical composition, moles, Avogadro's number, mass percent composition, empirical formulas, molecular formulas, chemical reactions, chemical equations, balancing chemical equations, enthalpy, gas laws, dilution, solubility, molarity, pH scale, pOH scale, buffers, neutralization reactions, definitions of acids/bases, equilibrium constant, Le Chatelier's Principle, solubility, oxidation, reduction, balancing redox reactions, activity series, radioactivity, nuclear decay, half-life, fission, fusion, hydrocarbons, isomers, functional groups, naming hydrocarbons, bio chemistry.)

### **Skill outcome**

Upon completion of this course:

At least 70% of the students should exhibit comprehension of problem solving skills for basic chemistry skills.

At least 70% of the students should exhibit comprehension of basic laboratory techniques.

### **Value outcomes**

Upon completion of this course:

At least 70% of the students will exhibit retention of course material by the end of the course.

V. Unless otherwise stipulated in this master syllabus by the department, the following items are subject to faculty discretion as described in each faculty member's individual course outline/syllabus:

a) Course Requirements? (grading/evaluation procedures; class attendance policy; term papers, projects, field assignments; examinations; class participation, etc.)

Typically 4 tests, 1 final for the lecture portion

Laboratory is one fourth of the total final points for the course.

For terms of evaluation, each of the four lecture tests will have at least twelve (12) selected questions. 70% of the students must exhibit comprehension of these questions.

For Test 1 the questions will cover; significant figures, basic units, density, conversion factors, definition of matter, classifications of matter, conservation of mass/energy, covalent/ionic compounds, covalent/ionic bonds, moles, Dalton's atomic theory, atomic composition, formulas, the Periodic table, and nomenclature.

For Test 2 the questions will cover; balancing chemical equations, solubility, chemical reactions, limiting reactants, enthalpy, electron configuration, Lewis structures, and electronegativity.

For Test 3 the questions will cover; gas laws, intermolecular forces, solutions, solubility, mass percent, dilution, acids, bases, pH, pOH, chemical equilibrium constant, solubility-product constant, and Le Chatelier's principle.

For Test 4 the questions will cover; oxidation numbers, redox reactions, activity series, radioactivity, nuclear decay, organic compounds, hydrocarbons, nomenclature of organic compounds, functional groups, isomers, and biochemistry.

For the Final Test, one hundred questions similar to those from the four lecture tests will be selected. This is to judge both comprehension and retention. 70% of the students must exhibit comprehension of these questions.

b) Required Text(s)?

**Introductory Chemistry** by Tro 3<sup>rd</sup> edition.

**1034 Laboratory Manual** by Gamble 1<sup>st</sup> edition.

c) Bibliography?

Department Head Signature/Date:

\_\_\_\_\_  
Signature

\_\_\_\_\_/\_\_\_\_\_/\_\_\_\_\_  
Date