



SYLLABUS

A. Course Description

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level	Language
CHM	103	General Chemistry	4	3	2	0	8		1	English

This course describes the fundamental observations, laws, and theories of chemistry at the basic level. Topics include atoms/molecules, stoichiometry, acids/bases, solutions, equilibrium, gases, solids, liquids, thermodynamics, the periodic table, and chemical bonding.

The chemistry lab is taken in parallel with the course and covers the following basic experiments: density, mass-mass relationship, limiting reactant, acid-base titrations, solubility product, reactions in aqueous solution, Calorimetry and redox reactions.

At the end of this course the student will be able to

- Acquire basics knowledge of chemistry.
- Name inorganic compounds using the IUPAC system of nomenclature.
- Explain properties of compounds in terms of the position of their constituent elements in the periodic table
- To learn about matter, atoms, molecules and chemical structure and the periodic table and its properties
- To learn chemical reaction calculations
- To learn the properties of solutions and gases and acidity and basicity in solutions
- Ability to realize the relationship among data when working in the laboratory

References: Required Textbook & Internal Website

I shall use **CHEMISTRY**, by T. E. Brown, H. E. H LeMay, B. E. Bursten, C. Murphy, P. Woodward, (11th Ed.), Pearson International Edition, 2009. ISBN-13: 978-0136006176

Students are required to purchase the textbook/materials (it is an obligation). The book contains the lecture notes as well as activities for the students to take part in; the book serves as a workbook.

Other references:

CHEMISTRY, R. Chang, (9th Ed.), McGraw-Hill, 2007. ISBN-13: 978-0073221038

Google Classroom Webpage: <http://www.imamm.org/>

B. Topics Outline

Disclaimer: this is a very fast-paced course. There will be little time—if any—for review. What follows is an approximate outline of the pace of the course. We may go faster or slower, contingent on the class response. The tentative list of topics to cover:

1. Matter and Measurement:



Science for the twenty-first century, the study of chemistry, the scientific method and hypothesis, a law and theory, matter and substance, mixture, physical means, elements and compounds, classification of matter, The three state of matter, Types of changes, Physical and chemical properties of matter, Extensive and Intensive properties, Measurement, handling numbers, Accuracy and precision.

2. **Atoms, Molecules and Ions:**

The atomic theory, Dalton's atomic theory, Cathode ray tube, Millikan's experiment, Types of radioactivity, Thomson's model, Rutherford's experiment, The structure of the atom, Atomic number, Masse number, Isotopes, The periodic table, Molecules and ions, Formulas and models, Chemical formulas, molecular formula, empirical formula, Formula of Ionic compounds, Chemical nomenclature, Naming compounds, Organic chemistry.

3. **Masse Relationships in chemical reactions (Stoichiometry):**

The mole, Avogadro's number, Molar mass, Molecular mass, Formula mass, the mass spectrometer, Percent composition and empirical formula, Experimental determination of empirical formulas, Chemical reaction, Chemical equations, Balancing chemical equations, Amounts of reaction and reactants and products, Reaction Yield, Limiting reagents.

4. **Reaction in aqueous solutions:**

General proprieties of aqueous solutions, Solution, solute, solvent, An electrolyte and nonelectrolyte, Precipitation reactions, Solubility, Properties of acids, Properties of bases, Arrhenius acid and base, Brønsted acid and base, Neutralization reaction. Oxidation-reduction reactions, Oxidation number, Types of oxidation-reduction reactions, Solution Stoichiometry, Concentration, dilution, indicators, Equivalence point, Gravimetric analysis, Acid base titrations, Redox titrations.

5. **Acid-Base Equilibria:**

Brønsted-Lowry Acids & Bases, The Autoionization of Water, The Autoionization of Water, The pH – Scale, Strength of Acids & Bases, Weak Acids, Weak Bases

6. **Thermochemistry:**

Nature of Energy, First law of thermodynamics, Enthalpy, Enthalpies of reactions, Calorimetry, Hess's law, Enthalpies of formation.

7. **Basic Concepts of Chemical Bonding:**

Chemical Bonds, Lewis Symbols, and the Octet, Ionic Bonding, Covalent Bonding, Bond Polarity and Electronegativity

C. Exams & Grading System

The semi-official dates of the exams for this course, with all the caveats, that the word “semi-official” entails, can be found here:

- **Midterm 1:** 6th or 7th week & **Midterm 2:** 11th or 12th week
- **Quizzes & Homeworks: During the semester**

Your course grade will be based on Final Exam, Midterms, Homework, Quizzes, Participation, Attendance and Project.

Midterm 1: 10 %	Midterm 2: 10 %	Final Exam: 40 %
Laboratory: 30 %		Quizzes; Homework & Attendance & Participation: 10 %



Grading distribution:

A+: [95, 100], A: [90, 95), B+: [85, 90) , B: [80, 85), C+: [75, 80), C: [70, 75), D+: [65, 70),
D: [60, 65), F: [0, 60).

D. Student Attendance/Absence

Only three situations will be considered as possible excused absences:

- Occurrence of a birth or death in the immediate family will be excused. (“Immediate family” is defined by the University as spouse, grandparents, parents, brother, or sister).
- Severe illness in which a student is under the care of a doctor and physically unable to attend class will be excused. Students are not excused for a doctor's appointment. Do not make appointments that conflict with rehearsals. Notes from the University Health Center will be accepted.

[Executive Rules for Study Regulations and Exams](http://goo.gl/ykm7t3)

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