CAMOSUN COLLEGE
School of Arts & Science

CHEM 110

Foundations of General Chemistry

This course is a prerequisite for students planning to study chemistry at higher levels. Topics include: Thermochemistry; reaction rates; chemical equilibria; solubility; acids, bases and salts; oxidation, reduction and electrochemistry; organic chemistry.

(4 Credits)
F, W, P (4,2,0,0,)
Prerequisite: Chemistry 060 or Chemistry 11

Teacher:

Howard J. Duncan

Office hours: See Timetable on Office Door

Office Location: F308B

Phone: 250-370-3445

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Required Materials:

Textbook: Fundamentals of Chemistry (Ralph Burns)

Chemistry 110 Lab Manual

Safety Glasses

Course Outline:

Gases, Liquids and Solids: General Characteristics of Gases, Liquids and Solids; Interionic and Intermolecular Forces;The Liquid State; Vaporization and Condensation;The Solid State; Melting and Freezing; Heating and Cooling Curves; Water – A Most Unusual Substance.

Solutions: What is a Solution? Solubility Terminology; Solubility of Ionic Compounds; Solubility of Covalent Compounds; Solubility Equilibria; Effects of Temperature and Pressure on Solubility; Solution Concentration; Colligative Properties of Solutions; Colloids; Osmosis and Dialysis.

Reaction Rates and Chemical Equilibrium: Reaction Rates and Collision Theory; Factors Influencing Reaction Rates; Reversible Reactions and Equilibria; Le Chatelier's Principle; Ammonia Synthesis; Catalysts and Reaction Rates; Equilibrium Constant Expressions.

Acids and Bases: The Arrhenius Theory of Acids and Bases; Strong and Weak Acids; Strong and Weak Bases; Acid-Base Neutralization Reactions; Bronsted-Lowry Acids and Bases; Conjugate Acid-Base Pairs; Ionization of Water; The pH Scale; Properties of Salts; Buffers – Controlling the pH of Solutions; Acid-Base Titrations; Lewis Acids and Bases.

Oxidation, Reduction and Electrochemistry: Oxidation Numbers; Oxidation and the Properties of Oxygen; Reduction and the Properties of Hydrogen; Oxidizing Agents – Hydrogen Peroxide, Antiseptics and Disinfectants; Reducing Agents; Oxidation and Reduction Half-Reactions; The Hydrogen Electrode and Standard Reduction Potentials; Electrolytic Cells; Voltaic Cells; Corrosion.

Organic Chemistry: General Properties of Organic and Inorganic Chemicals; Alkanes – The Saturated Hydrocarbons; Structural Formulas; IUPAC Nomenclature; Alkenes and Alkynes – Unsaturated Hydrocarbons; Aromatic Hydrocarbons; Alcohols; Phenols; Ethers; Aldehydes and Ketones; Carboxylic Acids and Esters; Amines and Amides.

Student Assessment

(1) Lab Reports (10%), (2) Midterm Exams (15% and 25%), (3) Comprehensive Final Exam (50%)

Grading System

A+ = 95 -100%	B = 75 - 79%	D = 50 - 59%
A = 90 - 94%	B- = 70 - 74%	F = Less than 49%
A- = 85 - 89%	C+= 65 – 6	
B- B+ = 80 - 84%	C = 60 - 64%	