

# GRANDE PRAIRIE REGIONAL COLLEGE

## DEPARTMENT OF SCIENCE *Fall 93*

### CHEMISTRY 1010

Instructor Dr. Barry Ramaswamy

Room J218

Telephone Office 539 2072  
Residence 539 6239

Prerequisites CHEM 30 MATH 30

Transfer Credits	University of Alberta	CH1010 + CH1020	6 Credits
	University of Calgary	CH 201	3 Credits
	Univ of Lethbridge	CH1000	3 Credits

Text Book CHEMISTRY, 3rd Edition

Author Stephen, S. Zumdahl  
D. C. Heath and Company  
Lexington, Mass.

Laboratory Manual University of Alberta Chemistry 100/104 Experiments.

One hard covered Laboratory Note Book is required for maintaining Laboratory Results.

Lab Coats are compulsory and available at the Book Store.

Safety Glasses are compulsory and available at the book store. You cannot attend a Laboratory session without safety glasses.

A Laboratory Breakage Deposit of \$30.00 has to be paid to the Cashier. Show the Receipt during the first Laboratory Class for Admittance.

## COURSE EVALUATION

First Midterm	Week of Oct 18 - 22	20 Marks
Assignments		10 Marks
Quizzes		10 Marks
Labs		20 Marks
Final Exam	December	40 Marks
Total		100 Marks

*The midterm examinations will be of 2 hour duration.  
The Christmas examination will be three hours.*

Assignments will be handed out every week and are due the following Friday. Late Assignments will not be accepted. Quizzes will be given as necessary during the Seminar and Class Hours. The Marks for the Quizzes and Assignments will be 20 Marks. You have to attend every Quiz to obtain full Marks.

Attendance to Classes and Seminars are strongly recommended.

Laboratory Attendance is Compulsory. A passing Grade in the Lab is required to pass the course.

A student is required to obtain an average of 50% to pass the course.

# SYLLABUS

Fall Semester.

Sept 7 - December 10, 1993

## 1.0 REVIEW

### [A] CHEMICAL FOUNDATIONS

- (i) Scientific Method
  - (ii) Units of Measurement.
  - (iii) Significant Figures and Calculations
  - (iv) Dimension Analysis
  - (v) Temperature, Density , etc
- Chapter 1 Pages 1 - 32

### [B] STOICHIOMETRY

- (i) Atomic Masses, The Mole
  - (ii) Molecular Weight/ Molar Mass, Percent Composition of Compounds.
  - (iii) Determining the Formula of a Compound
  - (iv) Stoichiometric Calculations
  - (v) Calculations involving Limiting Reagents.
- CHAPTER 2, 3 Pages 41 - 115

### [C] SOLUTION STOICHIOMETRY

- (i) The Nature of Aqueous Solutions.
  - (ii) The Concept of Molarity
  - (iii) Precipitation Reactions
  - (iv) Limiting Reagents in Aqueous Solutions.
  - (v) Simple Acid Base Reactions Involving Stoichiometry.
- CHAPTER 4 Pages 127 - 173

## 2.0

## GASES

- (i) Early Experiments
  - (ii) The Gas Laws of Boyles, Charles and Avogadro
  - (iii) Gas Stoichiometry
  - (iv) Daltons Law of Partial Pressures
  - (v) Effusion and Diffusion
  - (vi) Real Gases
  - (vii) Intermolecular Collisions
- CHAPTER 5                      Pages              183 - 222

## 3.0

## THERMOCHEMISTRY

- (i) Calorimetry
  - (ii) Hess's Law
  - (iii) Standard Enthalpies of Formation
- CHAPTER 6                      Pages              233 - 269

## 4.0

## BONDING AND STRUCTURE

## [A] ATOMIC THEORY

- (i) Daltons Atomic Theory
  - (ii) Early Experiments to Characterise the Atom
  - (iii) Modern View of the Atomic Structure: An Introduction.
  - (iv) Atomic Spectrum of Hydrogen
  - (v) The Wave Mechanical Model of the Atom
  - (vi) The Bohr Model
  - (vii) The Wave Mechanical Model of the Atom
  - (viii) Quantum Numbers
  - (ix) Orbital Shapes and Energies
  - (x) Electron Spin and Pauli Principle
  - (xi) Polyelectron Atom
  - (xii) The Aufbau Principle and the Periodic Table
  - (xiii) Periodic Trends in Atomic Properties
- CHAPTER 2                      Pages              41 - 71
- CHAPTER 7                      Pages              279 - 330

[B]            STRUCTURE AND BONDING

- (i)            Types of Chemical Bonds
  - (ii)           Electronegativity
  - (iii)           Bond Polarity and Dipole Moments
  - (iv)           Ion: Electron Configuration and Sizes
  - (v)           Formation of Binary Ionic Compounds
  - (vi)           Partial Ionic Character of Covalent Bonds
  - (vii)           The Localized Electron Bond Model
  - (viii)           Lewis Structures and the Octet Rules
  - (ix)           Exceptions to the Octet Rules
  - (x)           Resonance
  - (xi)           Valence Shell Electron Pair Repulsion, VSEPR, Model
  - (xii)           Hybridization and the Localized Electron Model
  - (xiii)           The Molecular Orbital Model
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| Chapter 8 | Pages | 341 - 392 |
| Chapter 9 | Pages | 403 - 430 |

V            TRANSITION METALS AND COORDINATION CHEMISTRY

- (i)            The Transition Metals: A Survey
  - (ii)           The First Row Transition Metals
  - (iii)           Coordination Compounds
  - (iv)           Isomerism
  - (v)           The Crystal Field Model
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| Chapter 20 | Pages | 935 - 968 |
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