# GRANDE PRAIRIE REGIONAL COLLEGE

## DEPARTMENT OF SCIENCE    *Fall 94*

## CHEMISTRY 1000

| | |
|---|---|
| Instructor | Dr. Barry Ramaswamy |
| | Room J218 |
| Telephone | Office        539 2072 |
| | Residence    539 6239 |

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| Prerequisites | CHEM 30        MATH 30 |

| Transfer Credits | | | |
|---|---|---|---|
| | University of Alberta | CHEM 100 | 6 Credits |
| | University of Calgary | CHEM 201/203 | 6 Credits |
| | University of Lethbridge | CHEM 1000/2000 | 6 Credits |

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|---|---|
| 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.

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.

# COURSE EVALUATION

| First Midterms | October and November | 10 Marks |
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| Christmas Exam | December 1994 | 20 Marks |
| Second Midterms | February and March | 10 Marks |
| Assignments | | 10 Marks |
| Quizzes | | 5 Marks |
| Final | April 1995 | 25 Marks |
| Laboratory | | 20 Marks |
| | | |
| Total | | 100 Marks |

The midterm examinations will be of 1 hour duration. The Christmas and final 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 15 Marks. You have to attend every Quiz to obtain full Marks.

Attendance to Classes and Seminars are strongly recommended. Laboratory Attendance to each specific experiment is Compulsory. A passing Grade in the Lab is required to pass the course. A doctors medical note is required for all excused absences.

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

# SYLLABUS

Fall Semester.                    Sept 6 - December 19, 1994

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

## 5.0 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

## 6.0 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

# SYLLABUS

## WINTER SEMESTER        January 3 to April 16, 1995

CHEMISTRY 1000

6.0                CHEMICAL EQUILIBRIUM

(i)        The Equilibrium Condition
(ii)       The Equilibrium Constant
(iii)      Equilibrium Expression involving Pressures
(iv)       Heterogeneous equilibria
(v)        Le Chateliers Theorem and Principle
(vi)       Solving Equilibrium Problems and Applications of the
           Equilibrium Constant
           CHAPTER 13        Pages        595 - 629

7.0                ACID BASE EQUILIBRIA

[A]        ACIDS AND BASES

(i)        Acids and Bases: Introduction
(ii)       Acidity and pH Scale
(iii)      Calculation of pH of Strong  and Weak Acids and Bases
(iv)       Bases and Concept of pOH
(v)        Polyprotic Acids
(vi)       Acids Base properties of Salts
(vii)      Solution of Acids and Bases containing a Common Ion.
           The Common Ion Effect
(viii)     Buffers and Buffer Capacities
(ix)       Calculation Involving Buffers
(x)        Acid Base Titration and pH Curves
(xi)       Problems involving Titration
(xii)      Acid Base Indicators
           Chapter 14        Pages        637 - 687
           Chapter 15        Pages        697 - 735