

**GRANDE PRAIRIE REGIONAL
COLLEGE**

DEPARTMENT OF SCIENCE *Fall 91*

CHEMISTRY 200

INSTRUCTOR *Dr. Joshua U. Otaighe*
Room: J210

Telephone *Office* 539
Residence

PREREQUISITES *CHEM 30* *MATH 30*

TRANSFER CREDITS *University of Alberta* *6 Credits*

TEXT BOOK: **CHEMISTRY** *Second Edition*

AUTHOR: *Stephen. S. Zumdahl*
D. C. Heath and Company, Lexington, Mass; Toronto

LABORATORY MANUAL:

University of Alberta Chemistry 200/202 Laboratory Experiments

Lab Coats are compulsory and are available at the Book store.

Safety Glasses are compulsory and available in the Laboratory. Room F 129.

A LABORATORY BREAKAGE DEPOSIT OF \$30.00 HAS TO BE PAID TO THE CASHIER. SHOW THE RECEIPT DURING THE FIRST LABORATORY SESSION FOR ADMITTANCE

COURSE EVALUATION

	MARKS
1. First Midterm Exam Week of Oct. 23 - 27	10
2. Christmas Examination	20
3. Second Midterm Exam Week of Feb 19 - 23	10
4. April Final Examination	30
5. Laboratory Reports	20
6. Assignment,	5
7. Quizzes	5
TOTAL	100

The two midterm examinations will be of 2 hour duration. The Christmas and the April Final Examination will be three hours.

Assignments will be handed out every week and are due the following Monday. Late assignments will not be accepted. Quizzes will be given as required after every chapter during the Seminar Hours. 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

September 5 to December 10, 1991

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 - 23

[B] STOICHIOMETRY

- (i) Atomic Masses, The Mole
- (ii) Molecular Weight, Molar Mass
- (iii) Percentage Composition of Compounds
- (iv) Determining the Formula of a Compound
- (v) Stoichiometric Calculations
- (vi) Calculations Involving Limiting Reagents

CHAPTER 3

Pages 73 - 110

[C] SOLUTION STOICHIOMETRY

- (i) The Nature of Aqueous solutions
- (ii) The Concept of Molarity
- (iii) Composition of Solutions
- (iv) Precipitation Reactions
- (v) Limiting Reagents in Aqueous Reactions

WINTER SEMESTER

CHEMISTRY 200

Jan 6 - April 16, 1992

5.0

ACID BASE EQUILIBRIA

A

ACIDS AND BASES

- (i) Acids and Bases: Introduction
- (ii) Acidity and the pH Scale
- (iii) Calculation of pH of Strong and Weak Acid and Bases
- (iv) Bases and the concept of pOH
- (v) Polyprotic acids
- (vi) Acid Base properties of Salts.
- (vii) Solutions of Acids or Bases Containing a Common Ion. (*The Common Ion Effect*)
- viii) Buffers and Buffer Capacities
- (ix) Calculations involving Buffers
- (x) Acid Base Titrations and pH Curves
- (xi) Problems involving Titrations
- (xii) Acid base Indicators

B

SOLUBILITY EQUILIBRIA

- (xiii) Solubility Equilibria and the Solubility Product
- (xiv) Complex Ion Equilibria
- (xv) Precipitation and Qualitative Analysis
- (xvi) Problems involving Precipitation and Qualitative Analysis

CHAPTER 14

pages 609 - 657

CHAPTER 15

Pages 669 - 730

6.0**CHEMICAL THERMODYNAMICS****A****FIRST LAW OF THERMODYNAMICS**

- (i) Enthalpy and Calorimetry
- (ii) Hess's Law
- (iii) Standard Enthalpies of Formation
- (iv) First Law of Thermodynamics

CHAPTER 6

Pages 222 - 253

B**ENTROPY FREE ENERGY AND EQUILIBRIUM**

- (i) Energy and Spontaneity: The need for a Second Law
- (ii) Reversible Processes
- (iii) Derivation of the Reversible Work of Expansion of an Ideal Gas
- (iv) Maximum Work
- (v) The entropy change for an isothermal process
- (vi) The Second Law of Thermodynamics
- (vii) Gibbs Free Energy Function
- (viii) Calculation of ΔG
- (ix) ΔG° and the equilibrium Constant
- (x) The Temperature Dependence of ΔH , ΔS , ΔG and K_{eq} .

CHAPTER 17

Pages 738 - 770

*This Chapter Will be Supplemented with Extensive Notes***7.0****ELECTROCHEMISTRY**

- (i) Galvanic Cells
- (ii) Standard Reduction Potentials
- (iii) Cell Potential, Electrical Work and Free Energy
- (iv) Electrolysis.
- (v) Application of Electrolysis and the Galvanic Cell

CHAPTER 17

Pages 779 - 814

8.0

CHEMICAL KINETICS

- (i) Reaction Rates
- (ii) Rate Laws: Introduction
- (iii) The Integrated rate Law
- (iv) Reaction Mechanism

CHAPTER 12

pages 515 - 552