GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE

CHEMISTRY 203 (1991 - 92)

INSTRUCTOR:	Dr. Barry Ramaswamy J 218
TELEPHONE:	539 2072 Office 539 6239 Residence
COURSE:	Chemistry 203
PREREQUISITE:	CHEM 30 or Equivalent MATH 30 & 31 or Equivalent (ENGINEERING STUDENTS ONLY)
COREQUISITE:	Math 212 or Equivalent
TRANSFER CREDITS:	Univ. of Alberta, CHEM 203, 4.3 Credits Univ. of Calgary, ENGG 201, 3 Credits
LECTURES:	Monday, Wednesday and Friday 9.00 - 9.50 AM B 208
SEMINAR:	Tuesday and Thursday 1.30 - 2.50 PM H 211
TEXT BOOK:	**MODERN UNIVERSITY CHEMISTRY** Robert T. Porile HBJ Publishers, 1987.
LAB BOOK:	Chemistry 203, Laboratory Experiments, University of Alberta, 1991

COURSE EVALUATION

Assignment / Quizzes	12.5 %
Lab Reports/ Lab Quizzes	12.5 %
Unit Examinations	35.0 %
Final Examination	40.0 %
Total	100 %

Note: A **pass grade** is essential for the Laboratory Component.

Assignments will be handed out every week and are due on the Friday. No late assignments will be accepted. Quizzes will be given during the lecture hour or during the seminar hour. You have to attend every quiz.

Attendance to Classes and Seminars are strongly recommended.

Laboratory attendance is compulsory. To be absent from the Lab will need a note from the Physician.

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

SYLLABUS

FALL SEMESTER Sept. 5 to December 10, 1991.

1.0 **REVIEW**

Approximately two weeks of lectures and two weeks of seminars. The following chapters are relevant, and the materials should be known from Chem 30.

CHAPTER 1. The Basic Constituents of Matter.
2. Chemical Equations and Stoichiometry.
3. Thermochemistry, Section 10.7 to 10.10

Problem Sets: 1 and 2.

2.0 **PROPERTIES OF GASES**

Equations of State for Ideal Gases, Daltons Law of Partial Pressures, Kinetic Theory of Gases, Effusion and Diffusion, Molecular Speeds, Van der Waals Equation of State, Critical Phenomena.

CHAPTER 4. Properties of Gases
5. Molecular Basis of Gas properties.

Problem Sets: 3 and 4.

3. **APPLICATIONS OF EQUILIBRIUM**

A. GENERAL. Gas Phase Equilibria, Heterogenous Equilibria, Le Chatelier's Principle.

CHAPTER 7. Chemical Equilibrium.

Problem Set: 5

B. ACID BASE EQUILIBRIA:
Review of Fundamentals, Bronsted-Lowry Acid-Base Theory, The Lewis Theory, Dissociation Constants, Levelling Effects, pH of Simple Complex Acids and Bases in Water, Indicators, Titration Curves, Buffer Solution, Hydrolysis, Polyprotic Acids.

CHAPTER 8. Acids and Bases

Problem Sets: 6 and 7.

C. IONIC EQUILIBRIA:

Solubility of Ionic Compounds, K_{sp} , Common Ion Effect, The Effect of Complexing Ligands, The Effect of pH on Solubility Equilibria, Selective Precipitation of Ions, Extraction and Separation.

CHAPTER 9. Ionic Equilibria.

Problem Set: 8

4. **THERMODYNAMIC PROCESSES AND THERMOCHEMISTRY.**

Reversible and Irreversible Processes, Internal Energy, PV Work, The First Law of Thermodynamics, Heat Capacity, Enthalpy, Processes Involving Ideal Gases, Thermochemistry, The Carnot Cycle, Heat Engines and Refrigerators.

CHAPTER 10. Energy in Chemical Processes. The First Law of Thermodynamics.

Problem Sets: 9 and 10

LABORATORY SESSIONS

Laboratory Classes start at exactly 3.00 pm. All students are supposed to be in the lab at that time, well prepared for the Lab.

Students are expected to attend all Laboratory Periods. Absence due to illness must be substantiated by presenting suitable evidence, preferably a letter from the physician, to the Lab Instructor/ Lab. Technician. An opportunity to make up a Lab will be given only for an excused absence.

The Laboratory Experiments are designed to allow a well prepared student to finish all the work within the allotted time. **IT IS YOUR RESPONSIBILITY TO COMPLETE THE LAB ON TIME.**

LABORATORY REPORT:

You must record everything you do and observe as you carry out your experiment. Use a Hard Covered Book for this purpose. Do not copy the procedure from the Laboratory Manual. Your Notebook will be checked periodically.
Formal Lab Reports should be written using the Format given in your Laboratory Manual. The Lab Reports are due on Tuesdays at 1.30 pm. **NO LATE LAB REPORTS WILL BE ACCEPTED.**

TENTATIVE LABORATORY SCHEDULE.

Date	Experiment
Sept. 10 and 12	Check In
Sept 17 and 24	AA. Reactions of Copper
October 1 and 8	BB. Ideal Gas Constant
October 15 and 29	DD. TITRATION OF ACIDS AND BASES
November 5 and 12	EE. TITRATION CURVES
November 19 and 26	CC. Enthalpy of Reaction