Registrar

W.90

GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE

CHEMISTRY 205 (1989-90)

INSTRUCTOR:	Dr. Som K. Pillay (Office: D 305; Tel: 539-2985)
PREREQUISITE:	CHEM 203 or equivalent and MATH 212 or equivalent (ENGINEERING STUDENTS ONLY)
COREQUISITE:	MATH 213 or equivalent
TRANSFER CREDIT:	U. of Alberta: CHEM 205, 3.8 Credits U. of Calgary: CHEM 209, 3 Credits
LECTURES:	MONDAYS, WEDNESDAYS & FRIDAYS 10.00 - 10.50 AM (F 138)
SEMINAR:	TUESDAYS & THURSDAYS 1.30 - 2.50 AM (C 110)
LABORATORY:	TUESDAYS 3.00 - 5.50 PM (F 129)
TEXT BOOKS AND LABORATORY ITEMS:	*Modern University Chemistry*, Norbert T. Porile, HBJ Publishers, 1987. *How to Solve General Chemistry Problems*, 7th Ed., R. S. Boikess and C. H. Sorum, Prentice-Hall Inc., 1987 (Optional). *Chemistry 205, Laboratory Experiments*, University of Alberta, 1989 Lab Coats and Safety Glasses

COURSE EVALUATION

Assignments/Quizzes	12.5 %
Lab Reports/Lab Quizzes	12.5 %
Unit Examinations	15.0 %
Mid-Tem Examination	15.0 %
Final Examination	45.0 %
	100 %

Note: A pass Grade is essential for the Laboratory Component.

TENTATIVE LECTURE SCHEDULE

Regular attendance of lectures/seminars is essential to achieve a good understanding of the course material. You are encouraged to ask questions and to participate in class discussions. Help is also available outside the class room. **NO APPOINTMENTS ARE NEEDED.**

WEEK OF	MON.	TUE./THU. (Tutorial)	WED.	FRI.
Jan. 2			Introduction	Thermo-dynamics
8	Thermo-dynamics	Thermo-dynamics	Thermo-dynamics	''
15	''	''	''	''
22	''	''	Electro-chemistry	Electro-chemistry
29	Electro-chemistry	Electro-chemistry	''	''
Feb.5	Electro-chemistry	Electro-chemistry	Electro-chemistry	Kinetics
12	Kinetics	Kinetics	Kinetics	''
19	Kinetics	**Mid-Term**	''	''
26	--	**READING**	**WEEK**	--
Mar. 5	Atomic Structure	Atomic Structure	Atomic Structure	Atomic Structure
12	''	''	''	''
19	Bonding	Bonding	Bonding	Bonding
	''	''	''	''
26	Molecular Structure	Molecular Structure	Molecular Structure	Molecular Structure
Apr. 2	''	''	''	''
9	Review	Review	Review	Review
16	--	**FINAL**	**EXAM**	--

LABORATORY SESSION

Laboratory sessions start at 3.00 PM sharp. All students are expected to come to the laboratory well prepared in the experiment that is to be performed and on time.

Students are expected to attend all laboratory periods. Absences due to illness must be substantiated by presenting suitable evidence to the Instructor/Lab Technician. An opportunity to make up a lab will be given only for excused absences.

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-cover laboratory note book for this purpose. Do not copy the procedure from the laboratory manual. Keep your note book neat. 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 ARE ACCEPTED.**

TENTATIVE LABORATORY SCHEDULE

DATE	EXPERIMENT
Jan. 9 & 16	QL. Qualitative Identification of Cations
Jan. 23 & 30	GG. Electrolysis
Feb. 6 & 13	LL. The Rate of Chemical Reactions
Mar. 6 & 13	KK. The Oxidation States of Vanadium
20 & 27	** Check-out **

TEXT: Chemistry 205, Laboratory Experiments, University of Alberta, 1989.

COURSE OUTLINE

EMPHASIS IS PLACED ON UNDERSTANDING OF PRINCIPLES AND THE ABILITY TO USE PRINCIPLES TO SOLVE PROBLEMS.

1. SPONTANEOUS CHANGE AND EQUILIBRIUM:

Spontaneous Processes, Entropy, The Second and Third Laws of Thermodynamics, Free Energy and Chemical Equilibrium, Temperature Dependence of K.

Chapter 11
Problem Sets: 1 and 2

2. ELECTROCHEMISTRY:

Review of Redox Reactions, Chemistry of Electrolytic and Galvanic Cells, Faraday's Laws, Electrode Potentials, emf, Free Energy and emf, Concentration Effects, The Nernst Equation, Commercial Cells, Fuel Cells, Corrosion.

Chapter 13
Problem Sets: 3 and 4

3. CHEMICAL KINETICS:

Rate Laws, Order of Reactions, Differential and Integrated Rate Equations for Zero, First and Simple Second Order Reactions, Half-life, Reaction Mechanisms, Arrhenius Law, Catalysis.

Chapter 14
Problem Sets: 5 and 6

4. QUANTUM THEORY AND ATOMIC STRUCTURE:

Electromagnetic Radiation, Black Body Radiation, Photoelectric Effect, Bohr Model, Hydrogen Spectrum,
The de Broglie Hypothesis, The Heisenberg Uncertainty Principle, The Schrodinger Wave Equation, Orbitals and Quantum Numbers, The Pauli Exclusion Principle, Hund's Rule, Electron Configuration, Periodic Properties.

Chapter 5 & 6
Problem Sets: 7 and 8

5. **CHEMICAL BONDING AND MOLECULAR STRUCTURE:**

Ionic Bonds, Energetics of Ionic Crystals, Covalent Bonds, Electronegativity, Dipole Moments, Molecular Orbitals, Hybridization, Resonance, Lewis Structures, Molecular Geometry, Intermolecular Forces.

Chapter 15 , 16 and 20
Problem Sets: 9, 10 and 11

6. **NUCLEAR CHEMISTRY (OPTIONAL):**

The Nucleus, Nuclear Stability, Nuclear Decay Processes, Kinetics of Radioactive Decay, Radioactive Dating, Radioactive Disintegration Series, Nuclear Reactions, Nuclear Fission and Fusion.

Chapter 23