GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE AND TECHNOLOGY
2002/2003

CHEMISTRY 2730:	Physical Chemistry — Physical Properties and Dynamics of Chemical Systems
PREREQUISITE:	CHEM 2710 or equivalent
INSTRUCTOR:	Les Rawluk Office J214 539-2738
TEXT BOOK:	Physical Chemistry, 7th Edition, by P.W. Atkins
LABORATORY ITEMS:	Chemistry 273 Laboratory Manual University of Alberta, 2002 Lab coats and safety glasses Hard cover Physics Laboratory Note Book

COURSE EVALUATION

Midterm Exam	25%
Final Exam	40%
Assignments	10%
Laboratory	25%

I Colligative Properties

- Boiling point elevation, freezing point depression, and osmotic pressure

II. Ionic Solutions

- Conductance, molar conductivity,
- Weak electrolytes, strong electrolytes
- Drift speed, ion mobility, ion conductivity
- Thermodynamic functions of formation, activity coefficients
- Ionic equilibria

III. Electrochemical Cells

- Standard potentials, measurement of activity coefficients
- Thermodynamic functions from cell potential measurements

IV. Kinetic Molecular Theory

- Gas pressure, Maxwell-Boltzmann distribution
- Collision frequency, mean free path, collision density
- Diffusion
- Gas imperfections

V. Chemical Kinetics

- Differential and integrated rate laws
- Experimental methods and techniques
- Influence of temperature
- Collision theory and transition state theory
- Composite mechanisms, consecutive reactions
- Rate constants and equilibrium constants
- Free radical reactions
- Catalysis

VI. Surface Chemistry

- Adsorption, adsorption isotherms
- Chemical reactions on surfaces, surface structure, surface tension
- Surfactants
- Colloids