
GRANDE PRAIRIE REGIONAL COLLEGE
DEPARTMENT OF SCIENCE AND TECHNOLOGY
2005/2006

CHEMISTRY 2730 Physical Chemistry — Physical Properties and Dynamics of
Chemical Systems

CONTACT HOURS: 3 Lecture hours per week; 1 Seminar hour per week; 3 Laboratory hours
per week; Total of 105 contact hours

PREREQUISITE: CH2710 or equivalent

TRANSFER CREDITS: CH2730 to U. of Alberta CHEM 373, 3 credits
CH2710/2730 to U. of Calgary CHEM 371, 3 credits

INSTRUCTOR: Les Rawluk Office J214 539-2738

EMAIL: lrawluk@gprc.ab.ca

WEBSITE: <http://blackboard.gprc.ab.ca>

OFFICE HOURS: Unrestricted

TEXT BOOK: *Physical Chemistry* by K.J. Laidler, J.H.Meiser, B.C.Sanctuary
Houghton Mifflin Company ©2003

LABORATORY Required: Chemistry 373 Laboratory Manual
University of Alberta, 2005
Lab coats and safety glasses
Hard cover Physics Laboratory Note Book
A Laboratory Breakage Deposit of \$30 per Chemistry course must be
paid to the Cashier (Room C315), and the receipt must be shown to the
Laboratory Technician (Mrs. Omana Pillay) during the first Laboratory
class.

SEMINAR: Seminars consist of problem solving and discussion of lecture materials.

COURSE EVALUATION

Midterm Exam	20%
Final Exam	45%
Assignments	10%
Laboratory Reports	15%
Laboratory Exam	10%

Alpha Grade	Approximate Percentage Conversion
A+	90–100
A	85–89
A–	80–84
B+	76–79
B	73–75
B–	70–72
C+	67–69
C	64–66
C–	60–63
D+	55–59
D	50–54
F	0–49

Attendance to all lectures and seminars is strongly recommended. Laboratory attendance to each specific experiment is compulsory; a passing grade in the laboratory component is required to pass the course. A doctor's medical note is required for **all** excused absences!

Students must obtain an overall average of 50% or better to pass the course. Students are encouraged to participate in class discussions, and help is available outside the classroom. **Appointments are not necessary.**

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. Transport Properties

- Fick's first law

V. Kinetic Molecular Theory

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

VI. 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

VII. Surface Chemistry

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