GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE

DIVISION OF CHEMISTRY

WINTER 2005

Instructor: Barry Ramaswamy

Office: J218

Phone: Office: 539 2072 Home: 539 6239

Prerequisite: Chemistry 2110 or equivalent courses

Transfer Credits: U of Alberta, CH213 3 Credits

Lectures: Thursday 10.00 – 11.20, J203 and Friday 10.00 – 11.20 J203

Laboratory: Friday 2.30 – 6.20 pm

Text Book: Quantitative Chemical Analysis, 6th Edition
Daniel C. Harris, WH Freeman and Company, 2001

Laboratory: Chemistry 213, Quantitative Analysis
B. Kratochvil and W.E Harris
University of Alberta, 2005

COURAE EVALUATION

Quizzes	15%
Lab Work	40%
Midterm	15%
Final Examination	30%
Total	100%

Note:
Quizzes: There will be a quiz every week during the term. The first Quiz will be on Friday January 21, 2005. The Quiz will include Laboratory work and Lectures done in class. Attendance to the quizzes is compulsory. Absence due to illness has to be substantiated with a report from the nurse or the physician. Attendance to the Laboratory is Compulsory. Absence should be substantiated wit a letter from the nurse or the physician.

SYLLABUS

1. Spectrophotometry.

   A first look at Spectrophotometry. Simple spectrophotometers and Analysis using Spectrophotometers.

   See Lab Book.
   - 18.1 Properties of Light
   - 18.2 Absorption of Light
   - 18.3 Measuring Absorbance
   - 18.4 Beers law and Chemical Analysis
   - 18.5 Fluorescence and Luminescence
   - 19.1 Analysis of a Mixture
   - 19.2 Measuring an equilibrium Constant; Scat chard Plot
   - 20.1 lamps and Lasers
   - 20.2 Monochromators
   - 20.3 Detectors
   - 20.4 FTIR

2. Electrochemistry

   - 14.1 Basic Concepts
   - 14.2 Galvanic Cells
   - 14.3 Standard Potentials
   - 14.4 Nernst equation
   - 14.5 E^o and the Equilibrium Constant
   - 14.6 Cells as Chemical Probes
   - 15.1 Reference Electrodes
   - 15.2 Indicator Electrodes
   - 15.3 Junction Potentials
   - 16.1 Shape of a Redox Titration Curve
   - 16.2 Oxidation with Oxidant and Reductants
   - 15.6 Ion Selective Electrodes
   - 15.7 pH measurement and the Glass Electrode
   - 15.8 Solid State Chemical Sensors
   - 17.1 Fundamental of Electrolysis
   - 17.2 Electro gravimetric Analysis
   - 17.3 Coulometry
   - 17.4 Amperometry
   - 17.5 Voltametry

3. Atomic Spectroscopy and Spectrometers

   - 21.1 An Overview
   - 21.2 Atomization
   - 21.3 Temperature and Atomic Spectroscopy
   - 21.4 Instrumentation
   - 21.5 Interference

4. Introduction to Analytical Separations

   - 23.1 Solvent Extraction
   - 23.2 Chromatography and a Plumbers view of Chromatography
   - 23.3 Efficiency of Separations

5. Chromatography

24.1 The separation process and gas Chromatography
24.2 Detectors
24.3 Sample preparation
24.4 Method Development in gas and Liquid Chromatography
25.2 Injection and Detection in Liquid and gas Chromatography
25.3 Reversed Phase separations
26.1 Ion Exchange Chromatography
26.2 Affinity Chromatography
27.1 Mass Spectrometry
27.2 Chromatography and mass Spectrometry

6. Literature Search

28.1 Chemical Search and Chemical Abstracts
28.2 How to do a Chemical search
28.3 Projects for Chemical search