GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE AND TECHNOLOGY

CHEMISTRY 2130

COURSE OUTLINE

Prerequisite:	CHEM 2110	
Transfer Credits:	University of Alberta	3 credits
	University of Calgary	3 credits
	University of Lethbridge	3 credits
Text Book:	TEXTBOOK OF QUANTITATIVE CHEMICAL ANALYSIS 4th Edition.	
Author:	Daniel Harris	
	W.H. Freeman and Co.	New York, 1995
Laboratory Manual:	University of Alberta Chem 2130 Lab Manual.	

GRADING

1.	Quiz	10 Marks
2.	Assignments	10 Marks
3.	Midterm	10 Marks
4.	Final Examination	30 Marks
5.	Lab Work	40 Marks
	Total	100 Marks

Quizzes: Quizzes will be given every week for 20 minutes during the lecture period. Quizzes will cover assigned readings, lectures and experiments in the laboratory.

Assignments: Assignments will be given each week and is due a week from the day it is received.

Absence: Absence from a quiz or a Lab needs a valid reasoning. Only a written excuse from a Doctor or the College Health Nurse or the Registrar will be accepted. If you have to miss a Lab please consult the instructor to make it up.

SYLLABUS

1. Oxidation reduction in analysis

   (i) The shape of a redox titration curve
   (ii) Titration of a mixture
   (iii) Redox indicators
   (iv) Common redox reagents

2. Potentiometry and selective electrodes

   (i) Basic Principles
   (ii) Standard potentials
   (iii) Nernst equation
   (iv) Using cells as chemical probes
   (v) Reference electrodes
   (vi) Indicator electrodes
   (vii) How ion selective electrodes work
   (viii) pH measurements with a glass electrode
   (ix) Ion selective electrodes
   (x) Solid state chemical sensors

3. Spectrophotometry

   (i) Properties of light
   (ii) Absorption of light
   (iii) The spectrophotometer
   (iv) A typical procedure: Serum iron determination
   (vi) Analysis of a mixture
   (vii) Spectrophotometric titration's
   (vii) Jobs method
   (viii) Components of a spectrophotometer
   (ix) Luminescence
   (x) Errors in spectrophotometry

4. Atomic spectroscopy

   (i) Absorption, emission and fluorescence
   (ii) Atomization, flames, furnaces and plasmas
   (iii) Instrumentation
   (iv) Analytical methods
   (v) Interference

5. Chromatography

   (i) Chromatographic methods
   (ii) Gas chromatography
   (iii) Liquid chromatography
   (iv) Ion exchange chromatography
   (v) Ion chromatography
   (vi) Molecular exclusion chromatography
   (vii) Chromatographic methods

6. Introduction to analytical separations

   (i) Solvent extraction
   (ii) Countercurrent distribution
   (iii) Chromatography

7. Sample preparations
   (i) Practical notes

LABORATORY EXPERIMENTS

1. Total salt by ion exchange
2. Trace iron by visible spectrophotometry
3. Sodium Fluoride in mouth wash. Method using a Fluoride selective electrode
4. Glucose analysis
5. Copper by atomic absorption
6. Dextromethorphan in cough syrup. Ion pair extraction and spectrophotometry
7. Nickel determination by chelation extraction and spectrophotometry
8. Benzene by gas chromatography
9. Nitroanilines by liquid chromatography
10. Radiochemical determination of thorium-234
11. A problem in literature searching