GRANDE PRAIRIE REGIONAL COLLEGE

DEPARTMENT OF SCIENCE AND TECHNOLOGY

CHEMISTRY 2110

COURSE OUTLINE

1998 - 99

Lecturer:	Dr. Barry Ramaswamy	
Room #:	J218	
Phone:	Home: 539 6239	Office: 539 2072
Prerequisite:	CHEM 1010, 1020 or equivalent courses.	
Transfer Credits:	University of Alberta	3 credits
	University of Calgary	3 credits
	University of Lethbridge	3 credits
TextBook:	TEXTBOOK OF QUANTITATIVE CHEMICAL ANALYSES 5th Edition.	
Author:	Daniel Harris	
	W.H. Freeman and Co.	New York, 1998
Laboratory Manual:	University of Alberta Chem 2110 Lab Manual.	

GRADING

1.	Quiz	10 Marks
2.	Midterm	15 Marks
4.	Final Examination	35 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. Tools of Trade

   (i) Analytical Balance
   (ii) Volumetric Flask
   (iii) Pipettes and Syringes
   (iv) Burettes and other measuring flasks
   (v) Experimental Error.

2. Statistics

   (i) Standard deviation and Probability
   (ii) Gaussian error curve
   (iii) Dealing with bad data
   (iv) Practical example of a Method and the least square analysis

3. Volumetric Analysis

   (i) Principles of Volumetric analysis
   (ii) Volumetric procedures and calculations
   (iii) Principles of a titration curve
   (iv) Titration of a mixture
   (v) Calculating titration curves with a spreadsheet
   (vi) End point detection

4. Ionic Equilibria

   (i) Review of chemical equilibrium
   (ii) Solubility products
   (iii) Common ion effect
   (iv) Complex formation
   (v) Activity coefficients
   (vi) Charge balances and Mass balance
   (vii) Systematic treatment of equilibrium
   (viii) Dependence of Solubility on pH

5. Acids and Bases

   (i) Introduction to acids and bases
   (ii) pH and strength of acids and bases
   (iii) Acid base Equilibria
   (iv) Weak acid and weak bases
   (v) Buffers
   (vi) Diprotic and polyprotic acids and bases

6. Acid Base Titration

(i) Titration of strong acids and strong bases
(ii) Titration of weak acid with a strong base
(iii) Titration of a weak base with a Strong acid
(iv) Titration of a weak base with a weak acid
(v) Isoelectric and isoionic pH
(vi) Finding the end point with a pH electrode
(vii) Titration in non aqueous solvents
(viii) Calculating titration curves with spreadsheets

7. EDTA Titration

(i) Metal Chelate Complexes
(ii) EDTA titration curves
(iii) Metal ion indicators
(iv) EDTA titration techniques
(v) Doing EDTA titration using a spreadsheet

8. REDOX TITRATIONS

(i) The Shape of a Redox Titration Curve
(ii) General Approach to a Redox Titration Curve
(iii) Titration of a Mixture
(iv) Redox Indicators
(v) Various Titration Methods