

Office of Academic Affairs
Tarleton State University
August, 2003

Master Course Syllabus Outline

Department: Chemistry, Geosciences, and Env. Sci. Course Prefix/Number: **CHEM 3074**

Official Course Title: **Quantitative Analysis**

Master Syllabus Approved by Department on: ____/____/____
month date year

I. Catalog Description (50 words; brief synopsis of course content, emphases)

A study of the experimental and theoretical principles concerning gravimetric and volumetric analysis. Topics include data treatment, equilibrium, precipitation, neutralization, oxidation-reduction, potentiometry, and introduction to spectroscopy.

II. Prerequisites?

A grade of C or better in 8 hours of freshman CHEM; junior classification, or approval of department head

III. Expanded Course Description (150 words; primary course content, intended student level and role(s) course is to play in the curriculum)

A study of the experimental and theoretical principles concerning gravimetric and volumetric analysis. Topics include data treatment, equilibrium, precipitation, neutralization, oxidation-reduction, potentiometry, and introduction to spectroscopy.

This course consists of 2 lecture hours and two three (3) hour lab periods per week for 4 hours of college credit and is offered each fall semester.

This course is the first in a two-semester analytical chemistry sequence, is required for all chemistry majors, and is usually taken in the junior year.

IV. Intended Student Learning Outcomes? Required; **knowledge outcomes** (what students who successfully complete the course will be expected to know). Optional; **skill outcomes** (what students who successfully complete the course will be able to do). Optional; **value outcomes** (what students who successfully complete the course will value or appreciate).

Knowledge outcomes:

Upon completion of this course, the student will have a satisfactory understanding of:

1. accuracy, precision, and data handling techniques.
2. stoichiometric calculations.

3. basic principles of chemical equilibrium.
4. the chemical natures of acids and bases and be able to calculate pH of solutions of strong and weak acids and bases, salts, and buffer solutions.
5. factors affecting solubility equilibria and be able to calculate solubilities.
6. electron exchange in chemical reactions, the basic principles of electro-chemistry, and be able to balance oxidation / reduction equations.
7. gravimetric Analysis.
8. acid-base, complexiometric, precipitation, and redox titrations.
9. potentiometric measurements.
10. basic spectroscopy.

Skill outcomes:

Upon completion of this course, the student will be able to:

1. demonstrate safe laboratory practices.
2. collect, record, analyze, and report analytical data.
3. perform stoichiometric calculations relevant to a laboratory environment.
4. perform basic gravimetric, titrimetric, potentiometric, and spectrophotometric analyses.

Value outcomes:

Upon completion of this course the student will have an understanding of the classical principles and practices of Analytical Chemistry.

V. Unless otherwise stipulated in this master syllabus by the department, the following items are subject to faculty discretion as described in each faculty member's individual course outline/syllabus:

- a) Course Requirements? (grading/evaluation procedures; class attendance policy; term papers, projects, field assignments; examinations; class participation, etc.)

. For this course, your grade will be determined in the following manner:

Lecture Grade:		50%
3 exams	45%	
10 quizzes	15%	
Homework	10%	
Final Exam	30%	
Laboratory Grade		50%
Unknown Results	50%	
Lab Reports	30%	
Final Exam	20%	

Make-up exams will be by permission of the instructor. Please contact the instructor immediately after the missed exam to make arrangements. **There is no make-up for quizzes.**

b) Required Text(s)?

"ANALYTICAL CHEMISTRY" by Gary D. Christian, 6th ed.

b) Bibliography?

Department Head Signature/Date:

Signature

_____/_____/_____
Date