

CHEMICAL ANALYSIS

CHEM 3425

Syllabus

Fall 2005

Dr. J. T. Smith

Office: S204

tsmith@sosu.edu

I. Course Objectives

By the end of this semester the student will be expected to: (1) Understand the fundamentals of chemical equilibria and their application in analytical problem solving; (2) develop the skills to approach problems in analytical chemistry; (3) become familiar with common analytical laboratory techniques and methods; and (4) develop the appropriate skills to both record and present laboratory data according.

II. Course Outline

A. Introduction to Statistics

1. Introduction to Analytical
2. Calculations: Some new.....some old
3. Errors in Analysis
4. Statistics
5. Calibration

B. Chemical Equilibria

1. Chemical Equilibria
2. Titrations
3. Activity
4. Complex Equilibria

C. Titrimetric Methods (Wet Chemistry)

1. Acid-Base Equilibria
2. Polyprotic Equilibria
3. Acid-Base Titrations
4. Complex Formations

D. Non-titrimetric Methods

1. Introduction to Electrochemistry
2. Potentiometry & Standard Electrode Potentials
3. Introduction to Spectroscopy
4. Fundamentals of Chromatography
5. Applications in Chromatography

III. TEXT

Lecture: *Quantitative Chemical Analysis*, 6th edition, by Daniel C. Harris; Freeman and Company Publishing, New York, 2003. (ISBN: 0-7167-4464-3)

Laboratory: Laboratory assignments will be given on a weekly basis. A laboratory fee of \$10 is charged to cover laboratory handout photocopying and miscellaneous charges (e.g. soap, paper towels, etc.).

IV. GRADING SYSTEM

A. Evaluation Procedures

1. Homework assignments
 - a. Problems assigned in class will not be taken up for grade.
 - b. Special assignments will be given randomly.
 - c. Online-problems will be graded as announced.
2. Quizzes
 - a. Quizzes are typically given weekly on Friday. However, some quizzes may be unannounced.
 - b. Students will be required to take some on-line quizzes at the web-based resource center associated with the text found at “<http://bcs.whfreeman.com/qca/>”. You will need to complete the student registration prior to taking your first quiz. Be sure to use Dr. Smith’s email as “tsmith@sosu.edu”.
 - c. Quizzes will represent 15% of your total grade.
3. Exams
 - a. The section exams will represent 40% of your total grade. These exams are typically a combination of matching or multiple choice, problem solving, and essay questions. Four section exams will be given periodically over the course of the semester. These exams will be given in the evening. If you have conflicting commitments, arrange an alternative time prior to the exam. *The lowest section exam grade will be dropped.*
 - b. The final exam will be given during "finals weeks" and will represent 20% of your total grade. The final exam will be comprehensive. The final exam will be given on regular scheduled Final date and time.

Probable Exam Dates

Exam 1	Sept. 13	Exam 2	Oct. 11
Exam 3	Nov. 8	Exam 4	Dec. 8

4. Laboratories
 - a. Laboratory reports are due the following week of the experiment. All reports should be prepared using a word processor and spell-checked. No hand written reports will be accepted. Two points (out of 20 possible) will be deducted for each late day.
After ten late days late you get no points for the assignment.
 - b. The laboratory notebook will be used only to collect data and record experimental observations (data) and for calculations. Laboratory notebooks will be taken up randomly and graded for completeness, format, and neatness.
 - c. All laboratory experiments must be completed in order to receive a grade for this class.
 - d. The lab final will consist of a paper research / presentation for a chosen analytical problem. The lab final is due on check-out day, Dec. 4 and 5.

B. Grading Standards

1. The lecture portion of this class will contribute 75% of the overall grade.
 - a. The ten best quiz grades and special assignments will count as 15%.
 - b. The section exams are worth 40% of your total grade.
 - c. The final exam is worth 20%.
2. The laboratory portion of the course will contribute 25% to your overall grade.

C. Letter Grade Assignment

The following percentages of our total grade must be earned to obtain the corresponding letter grade.

A > 85.0 %
B > 74.0 %
C > 63.0 %
D > 52.0 %
F < 52.0 %

V. AMERICAN WITH DISABILITIES ACT

Any student needing special accommodations due to a physical, mental or learning disability should contact Mrs. Susan Dodson, the Coordinator for Student Disability Services, Hallie McKinney, Room 111B or call (580) 745-2394 (TDD# 745-2704). It is the responsibility of each student to make an official request to the Coordinator for academic accommodations.

VI. CLASS POLICIES

(A) Attendance

1. Regular lecture attendance is expected.
2. Laboratory and examination attendance is mandatory unless prior arrangements are made.

(B) Laboratory / Safety Rules

1. Safety glasses **must** be worn at all times by every person who steps into the laboratory. NO EXCEPTIONS. Failure to observe this precaution or other safety practices will result in reduction of grade and/or dismissal from the course.
2. A laboratory coat is recommended during the experiments.
3. **Only** closed toed shoes will be permitted in the laboratory. No flip-flops, sandals, or other open-toed shoes are allowed.
4. Smoking, eating, and drinking in the laboratory are prohibited at all times.
5. No unauthorized preparation or experiments is to be attempted at any time.