

CHM 345: Introduction to Analytical Chemistry

Spring 2012

Course Instructors:

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Course Prerequisites: CHM 212 and 218

Lectures: S-465, Tuesday & Thursday 12:30-1:20 pm

Textbook: Quantitative Chemical Analysis, 8th edition, by Daniel C. Harris

ACS Academic Lab Safety Guide:

http://portal.acs.org/portal/PublicWebSite/about/governance/committees/chemicalsafety/publications/WPCP_012294

Labs: S-492, Tuesday & Thursday 1:30-3:15 pm

Lab Requirements: Lab goggles and a bound laboratory notebook

Course Description:

Introduction to the basic principles of Analytical Chemistry including traditional wet methods and contemporary instrumental methods of chemical analysis.

Course Objectives:

1. To learn how to analyze results through statistical methods.
2. To learn chemical equilibrium, titrations, and basic knowledge of electrochemistry.
3. To develop wet laboratory techniques essential for high precision experimentation.
4. To acquire the ability to operate advanced instrumentation and to interpret results through modern theory.

Grading: Homework 20%, Quizzes 15%, Labs 40%, and Final Exam 25%

Grading Scale: A 90-100 B 80-89 C 70-79 D 60-69 F < 60

Attendance:

Attendance for this class is not mandatory. Absences from quizzes and laboratories can only be made-up if the absence falls within one of the categories outlined in the undergraduate catalog. To make-up a quiz or lab, you will need to follow the process for securing an excused absence. All excused absences must be obtained as soon as possible.

Course Policies:

1. Homework and lab reports will not be accepted after their due dates.
2. Graphing calculators, calculators with alphanumeric programming, and calculators on cell phones, PDAs, etc. cannot be used during quizzes/exams. Likewise, sharing of calculators during quizzes/exams is prohibited.
3. During quizzes/exams, all materials necessary will be provided to you except a pencil and calculator. You may NOT use your own paper, etc.

- Please turn off cell phones during class, failure to do so may result in dismissal from lecture.
- Students with disabilities who require special accommodations will be made. www.marshall.edu/disabled.
- Academic dishonesty will be dealt with as outlined in the undergraduate catalog.

Tentative Schedule:

	Tuesday	Thursday
Week 1 1-10, 1-12	Chapter 0,1,2 Lab: Check in; Balance HW	Chapter 3,4 Lab: Volumetric Tech HW
Week 2 1-17, 1-19	Chapter 4 Lab: Grav. Cl HW	Chapter 26 Lab: Grav. Cl HW
Week 3 1-24, 1-26	Chapter 26 Lab: Grav. Cl Quiz	Chapter 5,6 Lab: Stand. NaOH HW
Week 4 1-31, 2-2	Chapter 6,7 Lab: % KHP HW	Chapter 7 Lab: Stand. HCl, Soda Ash Quiz
Week 5 2-7, 2-9	Chapter 8 Lab: Soda Ash Unknown HW	Chapter 9 Lab: pH Meter HW
Week 6 2-14, 2-16	Chapter 10 Lab: Titration Curve HW	Chapter 11 Lab: Unknown Acid Quiz
Week 7 2-21, 2-23	Chapter 13,15 Lab: Redox %Fe Known HW	Chapter 13,14 Lab: Redox %Fe Unknown HW
Week 8 2-28, 3-1	Chapter 14 Lab: [Cl ⁻] and the Nernst Equ. Quiz	Chapter 17 Intro. Spectroscopy HW
Week 9 3-6, 3-8	Chapter 17,18,19 Beer's Law Lab: % Fe by Spectrophotometry HW	Chapter 18,19,20 Beer's Law Lab: % Fe by Spectrophotometry HW
Week 10 3-13, 3-15	Chapter 17,19 Vibrational Spec. Lab: Spectrophotometric Analysis of a Mixture HW	Chapter 17,19 Vibrational Spec. Lab: Spectrophotometric Analysis of a Mixture Quiz
Week 11 3-20, 3-22	Spring Break	Spring Break
Week 12 3-27, 3-29	Chapter 17 Luminescence Lab: Transmission IR Spectroscopy HW	Chapter 20 Atomic Spectroscopy Lab: Transmission IR Spectroscopy HW
Week 13 [#] 4-3, 4-5	NMR Spectroscopy Lab: Forensic Drug Test (ATR-IR) Quiz	NMR Spectroscopy Lab: Forensic Drug Test (ATR-IR) HW
Week 14 4-10, 4-12	Chapter 22 Intro. Separations Lab: NMR known and unknown HW	Chapter 22 Intro. Separations Lab: NMR known and unknown Quiz
Week 15 4-17, 4-19	Chapter 23 Gas Chromatography Lab: Paper Chromatography (checkout) HW	Chapter 24 HPLC Lab: GC of mixture HW
Week 16 4-24, 4-26	Chapter 24 HPLC Lab: GC of mixture HW	Review Quiz
Week 17 5-1	Final Exam, 12:45 - 2:45	

Suggested Activities for Success:

1. Read the suggested material from the textbook before and after each lecture.
2. Try to work through every homework problem no matter how difficult.
3. Always attend class and take good notes.
4. Seek help from others, some possibilities:
 - a. Take advantage of office hours.
 - b. Work in small groups on studying for quizzes and the final.
5. Exercise regularly and maintain a healthy diet.

#Wednesday, April 4 is reserved for Assessment Day. Regular classes will not meet, but students are expected to participate in University-Wide Assessment Activities. Students may obtain a list of activities from their respective department chairs. Undecided students should go to their college offices for a list of Assessment Day activities. Regularly scheduled classes will resume at 4:00 P.M.