CHM 345: Introduction to Analytical Chemistry

Spring 2010

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, 7th edition, by Daniel C. Harris
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. 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.
2. During quizzes/exams, all materials necessary will be provided to you except a pencil and calculator. You may NOT use your own paper, etc.
3. Please turn off cell phones during class, failure to do so may result in dismissal from lecture.
4. Students with disabilities who require special accommodations will be made. www.marshall.edu/disabled.
5. Academic dishonesty will be dealt with as outlined in the undergraduate catalog.

Tentative Schedule:

	Tuesday	Thursday
Week 1 1-12, 1-14	Chapters 0, 1, 2 HW Lab: Check in; Balance	Chapters 3, 4 HW Lab: Volumetric Tech
Week 2 1-19, 1-21	Chapter 4 HW Lab: Grav. Cl	Chapter 27 HW Lab: Grav. Cl
Week 3 1-26, 1-28	Chapters 4, 5 Quiz Lab: Grav. Cl	Chapters 6, 7 HW Lab: Stand. NaOH
Week 4 2-2, 2-4	Chapters 6, 7 HW Lab: % KHP	Chapter 8 Quiz Lab: Stand. HCl, Soda Ash
Week 5 2-9, 2-11	Chapter 9 HW Lab: Soda Ash Unknown	Chapter 10 HW Lab: pH Meter
Week 6 2-16, 2-18	Chapter 11 HW Lab: Titration Curve	Chapter 12 Quiz Lab: Unknown Acid
Week 7 2-23, 2-25	Chapters 14, 16 HW Lab: Redox %Fe Known	Chapters 14,15 HW Lab: Redox %Fe Unknown
Week 8 3-2, 3-4	Chapter 15 Quiz Lab: [Cl^-] and the Nernst Equ.	Chapter 18,19,20 Intro. Spectrophotometry HW
Week 9 3-9, 3-11	Chapter 18,19,20 Beer's Law HW Lab: % Fe by Spectrophotometry	Chapter 18,19,20 Vibrational Spec. HW Lab: % Fe by Spectrophotometry
Week 10 3-16, 3-18	Chapter 18,19,20 Vibrational Spec. Quiz Lab: % Mn by Spectrophotometry	Chapter 18 Luminescence HW Lab: Transmission IR Spectroscopy
Week 11 3-23, 3-25	Spring Break	Spring Break
Week 12 3-30, 4-1	Chapter 21 Atomic Spectroscopy HW Lab: Transmission IR Spectroscopy	NMR Spectroscopy HW Lab: Forensic Drug Test (ATR-IR)
Week 13 4-6, 4-8	NMR Spectroscopy Quiz Lab: Forensic Drug Test (ATR-IR)	Chapter 23 Intro. Separations HW Lab: NMR known and unknown
Week 14 4-13, 4-15	Chapter 24 Gas Chromatography HW Lab: NMR known and unknown	Chapter 24 Gas Chromatography Quiz Lab: Paper Chromatography (checkout)
Week 15 4-20, 4-22	Chapter 25 HPLC HW Lab: GC of mixture	Chapter 25 HPLC HW Lab: GC of mixture
Week 16 4-27, 4-29	Chapter 26 Chrom Methods HW	Chapter 28 Quiz
Week 17 5-4	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.