

# CHEM 3520, Quantitative Analysis, CRN 17888 & 21789

Fall 2016, University of Central Arkansas

## General Information

**Professor:** Dr. Robert Mauldin

**Contact Information:** Laney-Manion Hall 303B, [rmauldin@uca.edu](mailto:rmauldin@uca.edu)

**Office Hours:** To be announced.

**Lecture:** MWF 8:00-8:50 AM, Laney-Manion Hall 103

**Laboratory:** CRN 17888, TTh 2:40-5:20 PM, Laney-Manion Hall 306

CRN 21789, TTh 8:00-10:40 AM, Laney-Manion Hall 306

## Required Course Materials

**Textbook:** "Quantitative Chemical Analysis" by Daniel C. Harris, 9<sup>th</sup> edition.

**Labs:** Paper copies of the laboratories will be distributed one week in advance of each lab. A laboratory notebook that makes carbon copies is required.

**Calculator:** A scientific calculator.

**Safety Glasses:** A pair of safety glasses with side-shields, ANSI Z87 certified.

## Course Description and Objectives

**Course Description:** Theory and practice of gravimetric, volumetric, and instrumental methods of quantitative analysis. The laboratory develops problem-solving and analytical techniques for the proper analysis of a variety of analytes. Three hours of lecture and 6 hours of laboratory per week. Prerequisite: Grade of C or better in CHEM 1451.

## Grading Policies

### 1. Grading Composition

11 participation-based labs (lab notebook entries must be approved before you are allowed to leave the lab) @ 20 points each = 220 points

3 lab reports (due by 5 PM Tuesday after the lab is completed – see schedule below) @ 40 points each = 120 points

3 exams @ 100 points each = 300 points

1 comprehensive final exam (covers lecture and lab material) = 200 points

**2. Grading scale:** 90-100%=A; 80-89%=B; 70-79%=C; 60-69%=D; <60%=F

**3. Extra Credit, Dropped Grades:** No extra credit will be offered and no grades will be dropped.

**4. Attendance and Missed Work Policy:** If you miss an exam or lab, the prorated grade on your final exam will be used in place of the missed exam or lab grade. If you miss more than 3 lab periods, you may be dropped from the course for non-attendance.

**5. Academic Misconduct Policy:** In the first instance of academic dishonesty (including smart phone use during an exam), a zero will be assigned for the assignment. In the second instance, a failing grade will be assigned for the class.

**6. Laboratory Safety Policy:** You are responsible for abiding by general safety and waste disposal procedures covered at the beginning of the semester and specific procedures addressed at the start of each lab period.

**7. Assigned End-of-Chapter Problems:** Although assigned problems are not formally a part of the grade for the course, it is your responsibility to work and study them in preparation for exams. Assigned problems will be distributed as we cover each chapter.

### **UCA/State/Federal Policies**

**1. Academic Misconduct Policy:** The University of Central Arkansas affirms its commitment to academic integrity and expects all members of the university community to accept shared responsibility for maintaining academic integrity. Students in this course are subject to the provisions of the university's Academic Integrity Policy, approved by the Board of Trustees as Board Policy No. 709 on February 10, 2010, and published in the Student Handbook. Penalties for academic misconduct in this course may include a failing grade on an assignment, a failing grade in the course, or any other course-related sanction the instructor determines to be appropriate. Continued enrollment in this course affirms a student's acceptance of this university policy. See the current Student Handbook for the procedure to appeal accusations of academic misconduct.

**2. Americans with Disabilities Act Policy:** The University of Central Arkansas adheres to the requirements of the Americans with Disabilities Act. If you need an accommodation under this act due to a disability, please contact the UCA Office of Disability Services, 450-3613. If you are pregnant, allergic to any chemicals, color-blind, or have any other condition that might impact work in a chemistry lab, tell me immediately so that we can make accommodations.

**3. Title IX Disclosure Policy:** If a student discloses an act of sexual harassment, discrimination, assault, or other sexual misconduct to a faculty member (as it relates to "student-on-student" or "employee-on-student"), the faculty member cannot maintain complete confidentiality and is required to report the act and may be required to reveal the names of the parties involved. Any allegations made by a student may or may not trigger an investigation. Each situation differs and the obligation to conduct an investigation will depend on the specific set of

circumstances. The determination to conduct an investigation will be made by the Title IX Coordinator. For further information, please visit: <https://uca.edu/titleix>. *\*Disclosure of sexual misconduct by a third party who is not a student and/or employee is also required if the misconduct occurs when the third party is a participant in a university-sponsored program, event, or activity.*

**4. Student Evaluations of Teaching Effectiveness Policy:** Student evaluations of a course and its professor are crucial elements in helping faculty achieve excellence in the classroom and the institution in demonstrating that students are gaining knowledge. Students may evaluate courses they are taking starting on the Monday of the twelfth week of instruction through the end of finals week by logging in to myUCA and clicking on the Evals button on the top right.

**5. Emergency Matters Policy:** An Emergency Procedures Summary (EPS) for the building in which this class is held will be discussed during the first week of this course. EPS documents for most buildings on campus are available at <http://uca.edu/mysafety/bep/>. Every student should be familiar with emergency procedures for any campus building in which he/she spends time for classes or other purposes.

### Course Schedule\*

<u>Dates</u>	<u>MWF Lecture</u>	<u>TTh Lab</u>
8/18-8/19	Chapter 0, The Analytical Process	Safety and Orientation
8/22-8/26	Chapter 1, Chemical Measurements	Calibration of Glassware (Participation)
8/29-9/2	Chapter 2, Tools of the Trade and Chapter 3, Experimental Error	What is the Fewest Number of Permanganate Ions Visible to the Human Eye? (Lab Report due on 9/6)
9/5-9/9	Chapter 4, Statistics Note: No lecture on Monday due to Labor Day Holiday	Statistics with Pennies (Participation)
9/12-9/16	Chapter 5 Quality Assurance and Calibration Methods, Exam 1 on Friday, 9/16	Strong and Weak Acids and Bases (Participation)

9/19-9/23	Chapter 6, Chemical Equilibrium	Acid/Base Standardization (Participation)
9/26-9/30	Chapter 7, Let the Titrations Begin and Chapter 8, Activity and the Systematic Treatment of Equilibrium	Total Alkalinity of Natural Waters (Participation)
10/3-10/7	Chapter 9 Acid/Base Equilibrium	Potentiometric Titration (Lab Report due 10/11)
10/10-10/14	Chapter 9, continued. Note: Lecture on Monday only...Fall Break (10/13-10/16) and Dr. Mauldin will be out of town on Wednesday.	No lab this week
10/17-10/21	Chapter 11, Acid-Base Titrations, Exam 2 on Friday, 10/21	pK <sub>a</sub> of an Acid-Base Indicator (Participation)
10/24-10/28	Chapter 12, EDTA Titrations	Water Hardness with EDTA Titration (Participation)
10/31-11/4	Chapter 14 Fundamentals of Electrochemistry	Salt Bridge (Participation)
11/7-11/11	Chapter 14, continued	Fluoride Determination using Ion Selective Electrodes (Lab Report due on 11/15)
11/14-11/18	Chapter 18 Fundamentals of Spectrophotometry	Determination of Phosphate in Natural Waters (Participation)
11/21-11/25	Chapter 18, continued (MW class only due to Thanksgiving Break, with Exam 3 on Wednesday 11/23)	Determination of FD&C Dyes in Grape Kool-Aid using Chromatography and UV-Visible Spectrophotometry

		(Participation)
11/28-12/2	Chapter 23, Introduction to Analytical Separations (MW lectures only since Friday is Study Day)	Supercritical Fluid Extraction of Caffeine from Ground Coffee with Analysis by Gas Chromatography- Mass Spectrometry (Participation)
12/5-12/9	Final Exam on Wednesday, 12/7, from 8-10 AM. Final covers both lecture and lab content.	No lab this week since it is final exam week.

**\*Note: Important dates are 10/28, drop deadline (W) and 11/28, drop deadline (WP/WE).**