Quantitative Analysis ACHM 321

Fall 2008, 3 credit hours
Department of Chemistry and Physics
University of South Carolina Aiken

Dr. C. L. Leverette
SBDG 305, 803-641-3291
ChadL@usca.edu

Lecture and Lab: MWF 10:00 AM—10:50 PM, SBDG 325

Office Hours: T 9:30-11:00 AM and WF 8:15 AM—9:00 AM and by appointment.*

*Please feel free to call or e-mail me when needed. In addition, my appointment schedule is very flexible. Therefore, if the office hours stated above do not fit into your schedule, we can set up a time that is convenient for you.

Prerequisite: ACHM 112
Corequisite: ACHM 321L

Text and required materials:

Quantitative Chemical Analysis, 7th Edition, by Daniel C. Harris (required)
Scientific calculator (capable of log, scientific notation, square root, nth root, and exponents)

*Although the text for the course is Quantitative Chemical Analysis, the lectures will consist of information pulled from a variety of sources. The assigned homework problems will come from the text. My plan for us is to work straight through the book covering the material in the order Harris suggests. This should allow you to follow along with the text as I lecture. This text is an easy read so I expect students to read the chapters that we cover as we are going through the material. Success in the course is achieved by taking excellent notes, reading the text/assigned readings, and practicing the problems.

Course Objectives: Quantitative analysis is an introduction course into the field of analytical chemistry. The goals of this course, as stated in the Programs Bulletin, are to provide practice of volumetric and gravimetric analysis with exposure to spectroscopic, chromatographic, and electrochemical methods. Beyond these basics, my personal goal is to provide you with the answer to the question, “What is analytical chemistry?” I hope that you will see analytical chemistry as the “measurement science”, and how analytical chemistry impacts all forms of research, from medical applications to industrial product development. Modern day applications of this “measurement science” bridge the scientific fields of biochemistry, physical chemistry, biology, physics, and materials science. David Harvey, author of Modern Analytical Chemistry stated that “the craft of analytical chemistry is not in performing a routine analysis on a routine sample, but in improving established methods and techniques, extending methods to new types of samples, and developing new methods for measuring chemical phenomena.” In essence, analytical chemists are problem solvers. In this course, we will cover more traditional wet-chemistry techniques that represent the earliest beginnings of analytical chemistry as well as modern techniques utilizing state-of-the-art instrumentation. After a short review of some key concepts learned in freshman chemistry, we will learn how to evaluate chemical data utilizing data analysis and statistics. We will also cover gravimetric analysis, equilibrium chemistry, titrimetric methods of analysis, spectroscopy, chromatography, and electrochemistry. Examinations testing a general understanding of these topics will be given at the end of each organized section.
The overall goal of this course is to equip you with needed skills while teaching you the core concepts of analytical chemistry. I will incorporate common terminology used in the field of analytical chemistry and will reference the text when appropriate. I will provide ways that I find to be easier for solving problems that are not in the text. You are more than welcome to use the approaches utilized in the text; however, these techniques will not be extensively covered in class.

Grading:

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<tr>
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<th>Pts</th>
<th>% of grade</th>
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<tr>
<td>Examinations (4) at 120 pts each</td>
<td>480</td>
<td>79</td>
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<tr>
<td>Final Exam</td>
<td>125</td>
<td>21</td>
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Total Points for the Course: 605 100

In an attempt to be as fair and reasonable as possible, I will give partial credit for problems on exams if the effort is demonstrated. My giving of partial credit is based solely on my discretion. Write out your calculations or I cannot give you any credit. I promise each of you that my desire is for you to succeed and to be fair to each person in the class. Because I will strive to be fair, partial credit will be assigned based on the amount and quality of detail provided for a given problem. I decide if the effort warrants partial credit. I will not argue the amount of partial credit given for one student compared to the next. If this becomes a problem throughout the semester, I reserve the right to stop giving partial credit to everyone.

No partial credit will be given for the final exam. The final exam is comprehensive and is the standardized American Chemical Society (ACS) exam. Final letter grades will be based on the percentage of the total points earned and on the tentative scale below.

The tentative grading scale is as follows:

- ≥ 84: A
- 81-83: B+
- 73-80: B
- 69-72: C+
- 59-68: C
- 55-58: D+
- 46-54: D
- ≤ 45: F

For all tests, The USC Aiken Honor Code is in full effect. If the instructor has evidence that a student has violated this honor code for a particular assignment, that student will receive a 0 for that assignment. If that student is caught in violation of the USCA Honor Code subsequently on a future assignment, that student will receive a failing grade for the course and a letter detailing and documenting the student’s actions will be sent by the instructor to the Vice Chancellor for Student Life and Services. Further information about violations of Academic Integrity can be found in the 2005-2006 USCA Student Handbook. You will be asked to sign the Honor Pledge on each examination.

Graded exams will be returned to you in a timely manner. **You will not be able to keep the graded exams.** You will be able to look over the exam during the class period briefly, and then you may come by and review your exam during my office hours or by appointment. Therefore, for preparation of the final exam, you will want to review your class notes and the homework problems.
October 16, 2008 is the last day to drop a course or withdraw without receiving a “WF” for Fall 2007.

Homework: Homework will be assigned regularly throughout the semester. I will not be taking up the homework. I will provide you with a key for each assignment so that you can see the correct answers as well as the correct procedure for solving the problem. Although the homework is not graded, if you do not do the homework you will not be successful in this class. The exams will contain problems that are very similar to the problems you work in the homework. Therefore, working the homework problems is excellent practice for the exams. I expect you to practice solving the types of problems covered in this course.

Portable Electronic Devices: The use of any portable electronic devices, including cell phones, pagers, MP3 players, iPods, etc., during class is not allowed for any reason unless prior approval has been given to a student from the instructor or unless required for the course. If you are planning to have any of these devices in class, they must be turned off and stowed away for the duration of the class period. If a student is seen touching, holding, or using any portable electronic device during a test period without the prior consent of the instructor, the instructor will assume that the student is cheating and the test will be recovered and a 0 will be given to that student for the assignment.

Attendance: Attendance of all class meetings is expected, though excused absences are understandable. However, regular attendance will be looked upon favorably at the end of the semester for people with borderline grades. An attendance sheet will be passed around each class period for you to sign. Any student who has more than 10% unexcused absences will be assessed a one letter grade penalty off the final course grade. Any student who has been absent (excused and unexcused) more than 25% of all class meetings will receive a failing grade for the class. Unexcused absences on exam days will result in a grade of 0 for the exam. Exams for people with excused absences must be made up as soon as possible at a time convenient to the student and the instructor. Excused absences require a doctor’s note, a note from a family member that includes a telephone number to check, a business note, or a receipt (in the case of car problems). Please contact me with any questions.

Disability Statement: If you have a physical, psychological, and/or learning disability which might affect your performance in this class, please contact the Office of Disability Services, 126A B&E, (803) 641-3609, as soon as possible. The Disability Services Office will determine appropriate accommodations based on medical documentation.