**Meeting Time and Classroom**
TR 9:25 am – 10:40 am, SSMB 127

**Instructor:** Dr. Wendy Cory  
**Office:** SSMB 314  
**Phone:** 843-953-1405  
**Email:** coryw@cofc.edu

**Office Hours:** Monday 1-2, Wednesday 10-11, or by appointment

**Co- or pre-requisite:** CHEM 220L  
**Pre-requisites:** CHEM 112, 112L, Math 111 or equivalents

**Required Materials:** ALEKS online course prep  
*Exploring Chemical Analysis*, 5th edition, by Daniel C. Harris  
Scientific calculator with logarithmic and exponential functions

**Optional Materials:** Solutions Manual for *Exploring Chemical Analysis*, 5th edition, by Daniel C. Harris

**OAKS:** Class material such as handouts for notes will be posted on our class OAKS website.

**Student Learning Outcomes:**
- To carry out concentration, titrimetric, equilibrium, and statistical calculations.
- To explain and apply the theory behind quantitative methods and modern instrumentation
- To construct and apply calibration curves used in chemical analysis
- To assess the quality of laboratory data and identify any sources of error
- To select the most appropriate method for a given chemical analysis
- To explain the principles of equilibrium and its applications
- To demonstrate problem-solving abilities in the area of chemical analysis

**Attendance/Participation:** You are expected to attend all lectures. If you must miss a class, it is your responsibility to get any missed material or announcements from another student in the class.

**Disability Services:** If you are a student with a documented disability who will require accommodations in this course, you must provide the proper documentation in the form of a Professor Notification Letter (PNL) on the first day of class. If you are certified to have extra time on tests and quizzes, this will need to be arranged with the SNAP office so that you can take the SNAP office. Dr. Cory will need the envelope for this test at least two days before the test so that it can delivered to the SNAP office in time for you to take it there. The same applies to the final exam. No exceptions.

**ALEKS Course Prep:** E-mails about this assignment were sent out before the beginning of the semester; the same information is given here. If you already finished the assignment, you have completed the requirement described here. An online prep assignment was designed to ensure students from different major and course backgrounds are ready to start the course. ALEKS goes at the pace of each individual student – if you are a little rusty in chemistry, it may take a while. If you are not, it should not take long. Regardless of the length of time it takes, completion of the ALEKS assignment counts as 5% of your overall grade. You will take an initial assessment and then go from there. Points earned are based on topic completion and not specific assessments. Please let me know if you have any issues with ALEKS. Sign up using the below instructions:
1. Go to aleks.com.
2. If you have used ALEKS before, login. If you have not, on the left-hand side there is a yellow box that says “New Student? Sign up now.” Click on it.
3. The course code is: TRV6F-M6HM9. When you type it in, you will be able to join our class.
4. Use the following code to complete the assignment; be aware that using this code for free access limits you to a two-week window to finish the assignment. The code is CE827-8D117-C2067-4B795.
5. If you take more than two weeks to complete the assignment, you will have to pay for access. This assignment must be completed no later than September 8, 2018, to receive credit.
Homework: Homework will be assigned for each chapter. It will not be collected or graded. However, it is necessary to complete homework successfully in order to perform well on quizzes and tests. You may work together with other students on homework problems; these assignments are considered quiz and test preparation.

Quizzes: Short quizzes will be given throughout the semester and will be announced in the previous class. You will be allowed to drop your lowest quiz grade at the end of the semester. There are no makeup quizzes so make sure you are on time for class.

Writing Assignments: Documents should be ≤ 1 page, single spaced. These will be graded as follows:
Content / accuracy / clarity 24 pts
Grammar and spelling 3 pts
Citations 3 pts (see http://library.williams.edu/citing/styles/acs.php)
Total: 30 pts

Assignment 1: Due September 6. Find a news article in the popular press (newspaper, magazine, internet) that involves analytical or environmental chemistry. Do NOT use a technical journal. Your first assignment will be edited by Dr. Cory. You will then re-submit the final version to be graded. This editing will only occur for the first writing assignment – the purpose of this process is to learn how to write clearly and effectively.
1. Summarize the article in one paragraph.
2. Make three lists of terms and concepts:
   a. terms you understand well
   b. terms that you are reasonably sure about
   c. terms that you don't understand
3. Write a list of questions, technical or otherwise, that the article raises in your mind.
4. Critique the article by addressing the validity of the data/arguments that the other uses. Be sure to include a proper bibliographic citation of your article.

Assignment 2: Due October 4. Find an article in Chemical and Engineering News of interest to you that involves analytical or environmental chemistry (examples: a new innovation, a real-world problem to be solved, employment opportunities, or government regulations).
1. Briefly summarize the article.
2. What new chemistry concepts did you learn or if you did not learn new chemistry what was reinforced for you?
3. Do you agree or disagree with any ascertainations made by the author and why?
4. Discuss why you selected the article and include a proper bibliographic citation.

Assignment 3: Due November 1. You will be given a journal article and will address the following points:
1. Summarize the article, as with previous ones.
2. Find and discuss terms and concepts in the paper that we have gone over in class this semester.
3. Discuss strengths and weaknesses of the paper / research.
4. Include a proper bibliographic citation.

Assignment 4: Due November 29. Find an article in one of the following journals that describes a new chemical analysis: Analytical Chemistry or Environmental Science and Technology.
NOTE: You will likely need to be on campus internet to access these journals. Be sure to include a proper bibliographic citation.
1. Summarize the method employed and the results that were found.
2. Describe how well you understood the article (or not).
3. What would you do as an analytical chemist to improve the procedure?
   Anal. Chem. link: http://pubs.acs.org/journal/ancham
   Environ. Sci. & Tech. link: http://pubs.acs.org/journal/esthag
Tests: There will be 3 tests during the semester and a fourth test + final exam on the final exam date/time. If you know that you will miss a test for a school-sponsored event, you must contact me as soon as possible so that you can take the test early. There are NO makeup exams. An unexcused absence on the day of a test will result in a zero on that test. If you have an excused absence documented by the Dean of Undergraduate Studies (http://studentaffairs.cofc.edu/services/absence.php) for any one of tests 1-3, your final exam grade will be substituted for that missing test grade.

Even if you have a good excuse, you may not miss more than one test. You will be dropped from the roll for excessive absence if you miss more than one test.

Test 4 will be given during the final exam period along with the final exam.

Final Exam: The final exam is cumulative and will cover lecture material from the entire semester. The final exam will be Tuesday, December 11, 8 – 11 am. It will consist of 70 multiple-choice questions. If you miss a test (ONLY for illness or unavoidable emergency, documented with the Dean of Undergraduate Studies), your final exam grade will also count as the missing test score.

Class/Professor Communication: It is your responsibility to check your g.cofc.edu email account daily.

College of Charleston Honor Code and Academic Integrity: Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved. Incidents where the instructor determines the student’s actions are related more to a misunderstanding will handled by the instructor. A written intervention designed to help prevent the student from repeating the error will be given to the student. The intervention, submitted by form and signed both by the instructor and the student, will be forwarded to the Dean of Students and placed in the student’s file.

Cases of suspected academic dishonesty will be reported directly by the instructor and/or others having knowledge of the incident to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student’s transcript for two years after which the student may petition for the X to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration—working together without permission— is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others’ exams, fabricating data, and giving unauthorized assistance. Research conducted and/or papers written for other classes cannot be used in whole or in part for any assignment in this class without obtaining prior permission from the instructor.

Students can find the complete Honor Code and all related processes in the Student Handbook at http://studentaffairs.cofc.edu/honor-system/studenthandbook/index.php

Grading: ALEKS online prep assignment 5%
Three in-class tests 45%
Quiz average 10%
Writing assignments 15%
Exam 4 5%
Final Exam 20%

Grading Scheme

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>94.0-100</td>
</tr>
<tr>
<td>A-</td>
<td>90.0-93.9</td>
</tr>
<tr>
<td>B+</td>
<td>87.0-89.9</td>
</tr>
<tr>
<td>B</td>
<td>84.0-86.9</td>
</tr>
<tr>
<td>B-</td>
<td>80.0-83.9</td>
</tr>
<tr>
<td>C+</td>
<td>77.0-79.9</td>
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<tr>
<td>C</td>
<td>74.0-76.9</td>
</tr>
<tr>
<td>C-</td>
<td>70.0-73.9</td>
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<tr>
<td>D+</td>
<td>67.0-69.9</td>
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<tr>
<td>D</td>
<td>64.0-66.9</td>
</tr>
<tr>
<td>D-</td>
<td>60.0-63.9</td>
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<tr>
<td>F</td>
<td>≤ 59.9</td>
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</tbody>
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**Test schedule:** This schedule is subject to change based on school closures for weather, etc.

Test 1  Thursday  September 13  
Test 2  Thursday  October 11  
Test 3  Thursday  November 8  
Test 4  Tuesday  during final exam date/time (see below)  
Final Exam  Tuesday  December 11, 8:00 am – 11:00 am

**Lecture Topics**

An approximate schedule of topics covered in this class is given below. It is recommended that you read ahead in the book before each class.

<table>
<thead>
<tr>
<th>Book Chapters/Sections</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 1 (1.3 – 1.5)</td>
<td>Concentration units, dilutions*</td>
</tr>
<tr>
<td>Chapter 2 (2.2 – 2.9)</td>
<td>Tools of the Trade</td>
</tr>
<tr>
<td>Chapter 3 (3.1 – 3.4)</td>
<td>Experimental Error and Uncertainty</td>
</tr>
<tr>
<td>Chapter 4 (4.1 – 4.5)</td>
<td>Statistics</td>
</tr>
<tr>
<td>Chapter 6 (6.1 – 6.4)</td>
<td>Titration and Solubility*</td>
</tr>
<tr>
<td>Chapter 8 (8.1 – 8.7)</td>
<td>Monoprotic Acids and Bases*</td>
</tr>
<tr>
<td>Chapter 9 (9.1 – 9.6)</td>
<td>Buffers*</td>
</tr>
<tr>
<td>Chapter 10 (10.1 – 10.5)</td>
<td>Acid-base Titrations*</td>
</tr>
<tr>
<td>Chapter 11 (11.1 – 11.3)</td>
<td>Polyprotic Acids and Bases*</td>
</tr>
<tr>
<td>Chapter 12 (12.1 – 12.5)</td>
<td>Activity, systematic treatment of equilibria</td>
</tr>
<tr>
<td>Chapter 14 (14.1 – 14.6)</td>
<td>Electrode Potentials*</td>
</tr>
<tr>
<td>Chapter 15 (15.2 – 15.4)</td>
<td>Electrode Measurements</td>
</tr>
<tr>
<td>Chapter 4 (4.6 – 4.8)</td>
<td>Calibration Curves</td>
</tr>
<tr>
<td>Chapter 5 (5.1 – 5.4)</td>
<td>Quality Assurance and Calibration Methods</td>
</tr>
<tr>
<td>Chapter 18 (18.1 – 18.4)</td>
<td>Properties of Light and Beer’s Law</td>
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<tr>
<td>Chapter 19 (19.1 – 19.5)</td>
<td>Spectrophotometry</td>
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<tr>
<td>Chapter 20 (20.1 – 20.5)</td>
<td>Atomic Spectroscopy</td>
</tr>
<tr>
<td>Chapter 21 (21.1 – 21.3)</td>
<td>Principles of Chromatography</td>
</tr>
<tr>
<td>Chapter 22 (22.1 – 22.3)</td>
<td>Gas Chromatography (GC) and Liquid Chromatography (HPLC)</td>
</tr>
</tbody>
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*Note these sections overlap significantly with material covered in CHEM 112, a prerequisite for this course. ALEKS course prep will help you review these topics early in the semester.*