Instructor: Prof. Scott K. Shaw  
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Hours: Fridays 8-11 am or by appointment  
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DEO: Prof. Sarah Larsen, E331 CB, phone 335-3124

Lectures Location/Times: 9:30-10:45 AM, Tue/Thurs, E215 Chemistry Bldg

Course Website: See ICON – https://icon.uiowa.edu/

Course Description: This course is designed to provide graduate students an advanced, cohesive understanding of analytical chemistry methods and instrumentation to promote success in graduate careers. Core concepts will be presented by formal lectures, student presentations, and open discussion. The curriculum incorporates aspects of statistics, error, limits of detection, chemical measurements, modern analytical instrumentation, and determination of chemical structure. Special emphasis will be put on the appropriate preparation and meaningful presentation of scientific results. The student is expected to dedicate significant effort both in and out of lectures to be successful.

Course Goals & Objectives:
Specific goals for the course include the student learning to:
1) properly acquire, manipulate, and interpret experimental data  
2) master characteristics and working mechanisms of instrumental tools  
3) apply analytical measurement techniques to current research challenges  
4) prepare and present data in an accurate and meaningful way

Texts and Materials: The required textbook for this course will be Harris, Quantitative Chemical Analysis. W.H. Freeman and Company. As the most recent edition (8th) is rather expensive, the student may wish to secure an earlier version (6th or 7th) as the content does not differ significantly. Supplemental materials will be made available via files posted to the ICON website or via library reserves. Students will be expected to access primary literature for course assignments and presentations.

Hand-held calculators (no laptops, tablets, phones, etc.) may be used on selected portions of exams. No calculator sharing will allowed on exams. Students must provide their own calculators.

Grading: Grades in this course will reflect the student’s ability to effectively communicate mastery of the goals and objectives outlined above. This will be assessed through homework assignments, exams, class
presentations, written reports, and active class participation. This course will use the +/- system of letter grades. Relative values of course assessments are provided here:

- **Homework Assignments:** 20%
- **Mid-term and Final Exams:** 40%
- **Class Presentations:** 15%
- **Written Reports:** 15%
- **In Class Participation:** 10%

**Re-grading:** Re-grading of any assessment may be requested within 24 hours of the time the original grading decision is presented to the student. Such requests must be accompanied by a written description of the justification(s) for the re-grade request. Note that a re-grade implies review of the entire assessment and may raise or lower the ultimate score.

**Late work:** All assignments are due to the appropriate ICON dropbox at the beginning of the class period on the due date as specified on ICON. Students will not receive credit for late work except under the most extreme circumstances (see attendance).

**Attendance:** On-time attendance is required and active participation will be evaluated for quantity and quality. Circumstances may arise that require some students to be absent or late. In these instances, the course director reserves the right to require documentation (flight boarding passes, funeral announcement, etc.) to verify and excuse the absence.

**Academic Integrity:** Students are expected to follow the University's Code of Student Life which includes exhibiting the utmost respect for academic honesty; anything less will result in severe consequences. If you are unsure of the definition of academic dishonesty, please visit [http://clas.uiowa.edu/students/handbook](http://clas.uiowa.edu/students/handbook), or specifically, [http://clas.uiowa.edu/students/handbook/academic-fraud-honor-code](http://clas.uiowa.edu/students/handbook/academic-fraud-honor-code) for a full statement on the subject.

Plagiarism is an issue of special interest and will receive respective attention during evaluation of assessments. Any indication of plagiarism in course work, papers, presentations, or exams will result in zero credit and referral of all parties to CLAS administration for punitive action.

**Behavior and General Course Practices:**

Students and course directors have a shared responsibility to create an environment where all may learn. As such, everyone involved in the course
will be expected to exhibit the utmost degree of courtesy and professionalism at all times. With this in mind:

1) The use of mobile/cellular phones is prohibited during class
2) The use of laptop computers, tablets, i-pads, etc. during class is a privilege that will be allowed contingent on the condition that these devices are used exclusively for facilitating in-class activities. The course director may revoke this privilege at any time and/or remove any student from the class who abuses this privilege
3) Electronic correspondence must be carried out via official UIOWA email addresses. Messages, replies, or forwards from non-official addresses cannot be considered viable for security reasons.
4) All homework and other assignments must be uploaded to the appropriate ICON drop box in one of the following formats: MS Word, Word Perfect, Post Script, Acrobat PDF, HTML, RTF, or Plain Text. This does allow scanning hand-written work and imbedding the resulting images into one of the accepted file formats.

Finally, be aware that video and audio may be recorded during lectures.

**Detailed Assessment Information:**

**Homework Assignments:** Homework assignments will be completed in groups. Groups should work together to develop an approach for completing the assigned work, but students are expected to arrive at their own, independent conclusions. Each assignment will include 'group participation points' which will be determined by cooperative group peers. Selected problems from the homework sets will be graded and returned. Students may only use resources explicitly approved by the course director for completing homework.

**Exams & Final Exam:** In-class exams will cover material included in homework sets, lectures (including student presentations), and from primary-literature references. There will be components of problem solving, calculations, short answer, and long answer responses. A comprehensive final exam will be administered at _____________ (to be determined per CLAS exam scheduling policy). Students may view the graded exams by arranging an appointment with the course director. The exams will not be returned to the students.

**Presentations:** Two in-class presentations will be given by each student. These are outlined below:

1) Each student will lead a literature review discussion to be 12-15 minutes in length + time for questions. The presentation will review a recently published primary-literature article relevant to a current lecture topic. The topic must be pre-approved by the course director.
2) An analytical technique presentation will be 25-30 minutes in length + time for questions and cover new material on an analytical technique to be selected by the student & course director. A list of suggested techniques will be provided by the course director. A successful presentation will introduce, explain, and lead the class through a practical application of the technique. Evaluations will be based on content accuracy, organization, appropriate use of technology, and professionalism in delivery.

Written Reports: Students will be responsible for two reports.
1) A 800-1000 word report on a chemistry or chemistry related Nobel Prize. The report should review the primary literature related to the prize and highlight direct impact the work has had on the development of modern analytical techniques.
2) A 2500-3000 word report on a modern analytical technique. The report should relate the following information to the reader:
   a. an introduction of the importance of the technique to modern analytical chemistry
   b. a review of technique development and refinements
   c. detailed mechanism(s) of the chemical measurement(s) involved
   d. specific problems the technique has addressed (including details of qualitative/quantitative analysis performed)
   e. characteristics of the chosen technique relative to others capable of the same or similar analysis
   f. concluding remarks and summary

The majority of information should be from primary literature articles, reviews, text books, or specifications from vendors/manufacturers. Word counts do not include figures, captions, or references. Specific formatting instructions will be provided (see ICON).

In Class Participation: Quality and quantity of in-class participation will be evaluated by the course director. In addition, the course director may identify out-of-class seminars, lectures, or other activities which students might attend and review for additional participation points. Note: In-class participation points are NOT the same as points awarded for participation in the homework assignments.

Administrative Home

The College of Liberal Arts and Sciences is the administrative home of this course and governs matters such as the add/drop deadlines, the second-grade-only option, and other related issues. Different colleges may have different policies. Questions may be addressed to 120 Schaeffer Hall, or see the CLAS Academic Policies Handbook at http://clas.uiowa.edu/students/handbook.

Electronic Communication
University policy specifies that students are responsible for all official correspondences sent to their University of Iowa e-mail address (@uiowa.edu). Faculty and students should use this account for correspondences (Operations Manual, III.15.2, k.11).

Accommodations for Disabilities

A student seeking academic accommodations should first register with Student Disability Services and then meet with the course instructor privately in the instructor's office to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

Academic Honesty

All CLAS students or students taking classes offered by CLAS have, in essence, agreed to the College's Code of Academic Honesty: "I pledge to do my own academic work and to excel to the best of my abilities, upholding the IOWA Challenge. I promise not to lie about my academic work, to cheat, or to steal the words or ideas of others; nor will I help fellow students to violate the Code of Academic Honesty." Any student committing academic misconduct is reported to the College and placed on disciplinary probation or may be suspended or expelled (CLAS Academic Policies Handbook).

CLAS Final Examination Policies

The final examination schedule for each class is announced by the Registrar generally by the fifth week of classes. Final exams are offered only during the official final examination period. No exams of any kind are allowed during the last week of classes. All students should plan on being at the UI through the final examination period. Once the Registrar has announced the date, time, and location of each final exam, the complete schedule will be published on the Registrar's web site and will be shared with instructors and students. It is the student's responsibility to know the date, time, and place of a final exam.

Making a Suggestion or a Complaint

Students with a suggestion or complaint should first visit with the instructor (and the course supervisor), and then with the departmental DEO. Complaints must be made within six months of the incident (CLAS Academic Policies Handbook).

Understanding Sexual Harassment

Sexual harassment subverts the mission of the University and threatens the well-being of students, faculty, and staff. All members of the UI community have a responsibility to uphold this mission and to contribute to a safe environment that enhances learning. Incidents of sexual harassment should be reported immediately. See the UI Comprehensive Guide on Sexual Harassment for assistance, definitions, and the full University policy.

Reacting Safely to Severe Weather

In severe weather, class members should seek appropriate shelter immediately, leaving the classroom if necessary. The class will continue if possible when the event is over. For more information on Hawk Alert and the siren warning system, visit the Department of Public Safety website.