004:171:001 – Advanced Analytical Chemistry  
Course Syllabus  
Fall 2012

Instructor: Prof. Scott K. Shaw  
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Hours: Wednesdays 8 to 11 am or by appointment  
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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 their graduate careers. Core concepts will be presented by both students and course director via lecture presentations and discussions. The curriculum will be wide in scope incorporating aspects of statistics, error, limits of detection, chemical measurements, modern analytical instrumentation, and determination of chemical structure via analytical techniques. 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:
1) proper interpretation of data (including statistics and theoretical comparisons)
2) the characteristics and working mechanisms of common analytical tools
3) the application of analytical methods to current scientific challenges
4) to 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) of the text as these do not differ significantly. Supplemental materials will be made available as needed via files posted to the ICON website or sent via class email. Students will be expected to access recently published primary literature for course assignments.

Calculators may be used for homework and on selected portions of exams. No calculator sharing will allowed on exams. Students must provide their own calculators.
**Grading:** The primary metric for grades in this course will be the student’s ability to effectively communicate mastery of the goal areas outlined above. This will be assessed through group homework assignments, exams, class presentations, written reports, and class participation. This course will use the +/- system of letter grades. Specific assessments are provided here:

- **Homework Assignments:** 20%
- **Exams (including final):** 45%
- **Class Presentations:** 15%
- **Written Reports:** 15%
- **In Class Participation:** 5%

**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 at the beginning of class on the due date. 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 will require documentation (flight boarding passes, funeral announcement, etc.) to verify 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 the CLAS administration for punitive action.
Behaviour and General Course Practices:

Students and course directors have a shared collegiate duty to help create a classroom environment where all may learn. At the most basic level, this means 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 in-class activities
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 reserves the right to revoke this privilege at any time and to remove any student from the class who abuses this privilege
3) email correspondence must be carried out via official UIOWA email address or via ICON. Messages, replies or forwards from non-official addresses cannot be considered viable for security reasons.

Detailed Assessment Information:

Homework Assignments: Unless otherwise instructed, homework assignments will be completed in groups assigned by the course director. Groups will work together to develop an approach for completing the assigned work, but students are expected to arrive at their own conclusions. Each assignment will include ‘group participation points’ which will be determined by the student’s 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 provided 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). The exams will not be returned. Students may view the graded exams by arranging an appointment with the course director.
NOTE: Do NOT make plans to leave campus for the semester until the date for the final exam has been determined.

Presentations: Two in-class presentations will be given by each student. These are outlined below:
1) A literature review presentation will be 15 minutes in length and worth 5% of course grade. The presentation will review a recently published primary-literature article relevant to a current lecture topic. The paper will be pre-approved by the course director.

2) The lecture topic presentation will be 30 minutes in length and cover new material on a core course topic to be selected by the student & course director. A list of suggested topics will be provided by the course director. The lecture presentation will introduce, explain, and lead the class through a practical application of the material to be successful.

Both presentations will be evaluated by the course director and the other students in the course. Evaluations will be based on content, organization, good use of technology, and professionalism in delivery.

Written Reports: Students will be responsible for two papers. These are outlined below:

1) A 2 page report on a chemistry or chemistry related physics/biology Nobel Prize. The report should review the primary literature related to the prize and explain the significance the work has had on the development of modern analytical techniques.

2) A 5 to 6 page report on a modern analytical technique, broadly defined. The report should focus on relating the following information to the reader: An introduction of the importance of the technique to modern analytical chemistry, a review of technique development and refinements, detailed mechanism(s) of the chemical measurement(s) involved, specific problems the technique has addressed (including any relevant quantitative analysis performed), characteristics of the chosen technique relative to others capable of the same or similar analysis, and concluding remarks. The majority of information should be from primary literature articles, reviews, or specifications from vendors/manufacturers.

Page lengths do not include figures or references. Specific formatting instructions will be provided.

I highly recommend you become familiar with the use of a citation managing program such as procite, endnote, mendelev, etc.

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: these points are NOT the same 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 privately with the course director to make particular arrangements. See www.uiowa.edu/~sds/ for more information.

Academic Honesty
All CLAS students 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 around the fifth week of the semester by the Registrar. 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 dates and times of each final exam, the complete schedule will be published on the Registrar's web site.

Making a Suggestion or a Complaint
Students with a suggestion or complaint should first visit with the course director (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.