Instructor: Prof. Scott K. Shaw  
Office: W476 Chemistry Building  
Hours: Mondays 8:00-11:00 am or by appointment  
Phone: 319-384-1355  
Email: scott-k-shaw@uiowa.edu  
DEO: Prof. Sarah Larsen, E331 CB, phone 335-1350

Teaching Assistants: All T.A. Office Hours are in E208 CB  
Ariel Bohman ariel-bohman@uiowa.edu  
Tues, 10:30 to 11:30 and  
Thurs, 10:30 to 11:30

Jacob Grant jacob-grant@uiowa.edu  
Monday, 10:30 to 12:30

Jennifer Schmidt jennifer-schmidt@uiowa.edu  
Monday, 2:30 to 3:30 and  
Tuesday, 5:30 to 6:30

C. J. Ronhovde cicily-ronhovde@uiowa.edu  
Monday, 5:30 to 6:30 and  
Wednesday, 12:30 to 1:30

Lecture: All – 8:00-9:15 Tue/Thurs, W268 CB

Laboratory: A01 – 2:30-5:20 Tue/Thurs, E440/428 CB  
A02 – 9:30-12:20 Tue/Thurs, E440/428 CB  
Computer Labs: W238 & W241 CB

All laboratory work must be completed during your assigned section

Course Description: This course is designed to provide understanding of the core instrumental methods used in analytical chemistry including spectroscopy, separations, and electrochemistry. The curriculum incorporates determination of chemical properties and system dynamics, limits of detection/quantitation, and sources and statistics of error via instrumental analysis. Emphasis is placed on mechanisms of instrumental measurements, qualitative and quantitative data analysis, analytical procedures, and proper presentation of results.

Course Goals & Objectives: The goal of this course is to teach the core practices of instrumental analytical chemistry. Lectures will reinforce
concepts, mechanisms, and practices in making accurate instrumental measurements. Experiments will introduce chemical analysis methods and instrumental techniques. Objectives for student learning include:

1) the characteristics and working mechanisms of analytical instruments
2) basic experimental designs for instrumental analysis
3) proper processing and interpretation of data (comparison to theory, including qualitative and quantitative analysis)
4) describing results via accurate and meaningful presentation

Safety: To ensure proper preparation for working in a chemistry lab, all students are required to score 100% on prescribed safety quizzes before beginning the associated experiment. In addition, students must:

1) wear safety goggles at all times while in the chemistry laboratory.
2) not wear open-toed shoes or shoes with perforations.
3) adequately cover their skin. If shorts, short dresses, or skirts are worn, students must change into (student provided) alternative clothing before beginning an experiment.
4) report any injury to your TA immediately.
5) not eat or drink in the laboratory.
6) dispose of all chemicals, sharps, and other waste as directed by the laboratory procedure, TA, and instructor.

Course Materials:

Course Texts: The textbook for this course will be Harris, Quantitative Chemical Analysis. 8th Edition, W.H. Freeman and Company. Additional books may be on reserve at the chemistry library as necessary. Students will also be expected to access primary literature material.

Laboratory Manual: The laboratory manual will be made available in digital format via the ICON website. Students are responsible for bringing a copy of the manual to lab & lecture.

Laboratory Notebook: Students are responsible for purchasing a laboratory notebook with carbon copy pages before the first lab period.

Course Website: Course materials will be posted on the 004:143 ICON site. Log in with your hawkid and password at: https://icon.uiowa.edu/

Computer Facilities: The Chemistry Department computer facilities in W238 and W241 CB will be available for course related activities. These rooms have multiple computers with access to University software as well as digital scanners to create digital files. This room is accessible with your university ID card during regular building hours. See addendum for additional access to computers and digital scanners.

Grading: The primary metric for this course will be the student’s ability to effectively communicate mastery of the goals and objectives outlined above in a safe, responsible, and professional manner. This will be
assessed through quizzes, homework, exams, written reports, and active participation in course activities. This course will use the +/- system of letter grades. Relative values of course assessments are provided here:

<table>
<thead>
<tr>
<th>Assessment Mechanism</th>
<th>Fraction of course grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Lab Exercises and Quizzes:</td>
<td>10%</td>
</tr>
<tr>
<td>Laboratory Reports &amp; Notes:</td>
<td>60%</td>
</tr>
<tr>
<td>Homework:</td>
<td>10%</td>
</tr>
<tr>
<td>Final Exam*:</td>
<td>15%</td>
</tr>
<tr>
<td>Participation and Lab Citizenship:</td>
<td>5%</td>
</tr>
</tbody>
</table>

* Students must provide their own hand-held calculators for exams. No laptops, tablets, phones, or other devices with imaging or internet connectivity will be allowed. No calculator sharing will be allowed.

Answer keys to assessments will be available for inspection during office hours with the TAs. Be prepared to provide your graded assessment before temporarily viewing a corresponding answer key.

**Detailed Assessment Information:**

**Lab Notebooks:** Experimental observations are to be recorded in your lab notebook in blue or black ink. Be sure to clearly label your lab book with date, name, experiment details and procedures, and list file names where any digital data is stored. A carbon copy of your notes must be turned in to your TA at the end of each lab period. You are responsible for purchasing a carbon copy lab notebook. If the results of your lab are digital, printed data must be attached to your lab book carbon copy.

**Pre-Laboratory Exercises:** Each experiment will have a pre-lab exercise and video. The pre-lab exercise must be turned in before you will be allowed to begin laboratory work. See “Pre-Lab Exercise Guidelines” on ICON for additional information. The videos have an associated quiz on ICON which must also be completed before you will be allowed to begin the experiment.

**Laboratory Reports:** Each student will be responsible for submitting original, independent, reports to the appropriate ICON dropbox for each course experiment. Reports will be due at 9:30 a.m., seven days after the laboratory rotation is completed. Reports must be typed on a word processor. All text and data must be combined into a single digital file for upload to ICON. See “Laboratory Report Guidelines” on ICON for additional information on formatting and tips for good writing practices.

Within the report, the following headings should be included:

1) Title page  
2) Introduction  
3) Experimental Methods
Homework and Quizzes: Unless otherwise instructed, students must work independently on homework and quizzes. Homework will be due to the appropriate ICON dropbox at the beginning of lecture on the due date.

Final Exam: Exams will cover material included in homework sets, lectures, laboratory experiments, and from primary-literature references. There will be components of problem solving, calculations, short answer, multiple choice, and long answer responses. The final examination date and time will be announced by the Registrar generally by fifth week of classes. I will announce the final examination date and time for this course at the course ICON site once it is known. Do not plan your end of the semester travel plans until the final exam schedule is made public. It is your responsibility to know the date, time, and place of the final exam.

Participation & Lab Citizenship: Quality and quantity of participation will be evaluated by the course director and TAs. In addition, the course director may identify out-of-class seminars, lectures, or other appropriate activities in which students might contribute for additional participation points. Being a good lab citizen and co-worker is a vital skill for successful experiments. All students are expected to treat the laboratory equipment with respect and should strive to create a welcoming, educational environment for all participants.

Re-grading: A student may request re-grading of any assessment within 48 hours of the time the original grading decision is presented. Such requests must be accompanied by a written justification(s) for the re-grade request. Note that a re-grade request initiates review of the entire assessment and may raise or lower the ultimate score.

Late work: Assignments submitted late will lose 20% of total possible points per day. Assignments turned in more than 48 hours late will receive no credit.

NOTE: Pre-lab quizzes and exercises must be completed before the laboratory period and may not be turned in late. Failure to comply will result in a missed lab and no credit.

Make-up Labs: If a student is excused from a lab period based on illness or another qualifying reason, the instructor may permit a make-up
laboratory period or other suitable arrangement. The student must request this extra time from the instructor by submitting a “Lab Make-Up Request” form via ICON dropbox.

**Attendance:** On-time attendance is required and will be evaluated. Circumstances may arise that require some students to be absent or late. In these instances, the course director reserves the right to require documentation and contact information to confirm and excuse the absence.

**Laboratory Equipment Policy**
1) All glassware and other equipment received at the beginning of the semester by a student registered for a given course and assigned a drawer/locker is the responsibility of that student.
2) On the day of check-in, the student must insure that all the equipment required for the course is in the drawer, the glassware has no chips or cracks and that the equipment is in good working order. The Chemistry Department will replace any glassware or equipment that is defective at the time of check-in.
3) At the end of the semester or at the time the student leaves the course, every piece of glassware and equipment must be returned to the Department without chips or cracks and in good working order.
4) All pieces of glassware or equipment missing, broken, or not in good working order that was in your student drawer must be replaced and could be charged to your account through the University billing system after the close of the semester.

**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 and its detection will receive special levels of attention in this course. All materials turned in for credit are expected to be original work of an individual student. In some experiments students will work in groups to collect data, but analysis, figures, and reports must be prepared individually. No collaborative work is permitted on lab reports after the conclusion of the experimental procedure. Plagiarism will result in zero credit and referral of all parties for punitive action.

**General Course Practices:**

Students and course directors have a shared responsibility to create an environment conducive to learning and professional growth. As such, all
class participants 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, labs,
or exams
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) 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 as a single
digital file to the appropriate ICON drop box.

Finally, be aware that video and audio may be recorded for the purposes of
improving future course offerings. If this makes you uncomfortable, you
may request to be excluded from the recordings.

Resources for Students:
Students may find the Campus Writing Center very useful for this course;
the Tutor Iowa site is also very valuable for students seeking extra help:
Writing Center:  http://www.uiowa.edu/~writingc/
Tutor Iowa:  http://tutor.uiowa.edu/

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.

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 correspondence (Operations Manual,
III.15.2. Scroll down to k.11).
**Accommodations for Disabilities**
A student seeking academic accommodations should first register with Student Disability Services and then meet privately with the course instructor to make particular arrangements. See [www.uiowa.edu/~sds/](http://www.uiowa.edu/~sds/) for more information.

**Academic Honesty**
All students taking CLAS courses 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 date and time of every final examination is announced by the Registrar generally by the tenth day of classes. **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. It is the student's responsibility to know the date, time, and place of the 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 Public Safety website.