

**CHEM:5108 - Spectroscopy**  
**Course Syllabus      Fall 2018**

**Instructor:** Prof. Scott K. Shaw  
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**Lectures Location/Times:** 8:00-9:15 AM, Tue/Thurs, E225 CB

**Course Website:** See ICON - <https://icon.uiowa.edu/>

**Course Description:** This graduate-level course provides a survey of optical methods for spectrochemical analysis.

**Course Goals & Objectives:**

The student will learn to:

1. criticize literature articles
2. evaluate the feasibility of an idea
3. suggest spectroscopic apparatus for experiments
4. prepare and present data in an accurate and meaningful way
5. apply spectrochemical measurements to current research challenges

**Texts and Materials:** Recommended textbooks for this course include:

- D. C. Harris, *Quantitative Chemical Analysis*
- J. D. Ingle and S. R. Crouch, *Spectrochemical Analysis*
- D. A. Skoog, Holler, and Crouch, *Principles of Instrumental Analysis*

Supplemental materials will be made available via files posted to the ICON website. Students will be expected to access primary literature for discussions, assignments, and presentations.

Calculators, laptops, tablets, etc. may be used on homework and are encouraged during class. Students must provide their own devices.

**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:

<i>Exams:</i>	<b>20%</b>
<i>Homework:</i>	<b>20%</b>
<i>Presentations:</i>	<b>20%</b>
<i>Reports:</i>	<b>20%</b>
<i>Participation:</i>	<b>20%</b>

**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.

**Attendance:** *On-time* attendance is required and active participation will be evaluated for quantity and quality on an individual basis. Circumstances may arise that require some students to be absent or late. In these instances flight boarding passes, funeral announcements, a physician's note, or equivalent will be required.

**Late work:** Late work is not accepted unless you have a physician's statement of your incapacitation, at which point appropriate alternative arrangements can be made.

**Academic Integrity:** The University's Code of Student Life includes a full statement on academic integrity and honesty; anything less than 100% adherence will result in referral to the University for investigation and disciplinary action. If you are unsure of the definition of academic dishonesty please consult your instructor and read the documents at: <http://clas.uiowa.edu/students/handbook>, <http://clas.uiowa.edu/students/handbook/academic-fraud-honor-code>

**General Course Philosophy and Practices:**

- 1) Everyone involved in the course will be expected to exhibit courtesy and professionalism at all times.
- 2) *Collaboration* is encouraged on all assignments except examinations. Collaboration means working *with* someone so that

both of you know more than either would if you had not worked together. Collaboration on examinations is prohibited.

- 3) Lectures are a guide to what the instructor views as interesting or useful. They are not meant to provide comprehensive content.
- 4) E-mail correspondence must be carried out exclusively via official @UIOWA.EDU email addresses.
- 5) All homework and other assignments must be uploaded to the appropriate ICON drop box. Scanning hand-written work and uploading images is acceptable. Legible writing and clear organization are required.
- 6) Be aware that video and audio may be recorded during lectures.
- 7) Your instructor talks too fast. Be sure to slow him down by asking good questions at regular intervals.

### **Detailed Assessment Information:**

#### Exams:

In a graduate course, exams no longer seek to have you hand back what you've been handed. Rather, they seek to have you synthesize what you've learned in solving novel problems. Exams may include calculations, criticism of a literature article based on what you've learned, design of an experiment, and evaluation of a proposed idea. What you have learned will be revealed by your use of the concepts covered in class activities.

#### Homework Assignments:

Homework assignments will involve complex problems that go beyond material presented in class. Students will need to carry out research and seek additional sources of information. These assignments are meant to be collaborative, e.g. groups of students *should work together* to develop an approach for completing the assigned work, *but each student should arrive at their own, independent conclusions and each student must submit their own, unique responses to ICON*. Selected problems from the homework sets will be graded and returned. Some may re-appear on exams.

#### Presentations:

Each student will deliver two in-class presentations. These are outlined below:

- 1) Students will lead a class discussion on a primary research article. The article will be pre-approved by the course director. The student will present the technique used, critique the paper's major findings, and address questions from the class.
- 2) Students will deliver an oral defense of a research idea that employs an advanced spectroscopic technique. The presentations will:
  - 1) explain the technique's unique spectroscopic attributes,
  - 2) explain why this technique is the best tool for the proposed research
  - 3) offer an interpretation of data from the technique as it explains a chemical process or phenomena,
  - 4) field questions from a panel of peer reviewers.

#### Written Reports:

Each student will be responsible for three literature summary reports and one white paper. These are outlined below:

- 1) Students will submit individual summary documents of three separate literature articles presented in this class. Each summary will target different audiences as follows:
  - 1) a non-scientist without a college degree,
  - 2) a scientifically literate non-expert,
  - 3) an advanced technical expert.The summary reports will be 300-500 words long. A student cannot present and report on the same paper. The summaries must be submitted to ICON on the assigned deadlines.
- 2) Groups of students (assigned by the instructor) will be responsible for submitting a white paper. A white paper is a common first step in preparing a proposal for research funding. They are short documents that provide a project overview for evaluation by a program manager, who ultimately decides whether or not to invite the author(s) for a full proposal. Student papers should:
  - 1) utilize an advanced spectroscopic technique to answer a chemical question,
  - 2) address the questions presented in the Heilmeyer catechism,
  - 3) contain 2-3 graphics, one of which must be a schematic of the spectroscopic technique,
  - 4) fit into two and one-half single-spaced pages, and
  - 5) include a bibliography (not counted towards the 2-page limit).

#### Participation:

Quality and quantity of in-class participation will be evaluated holistically. You are encouraged to:

- 1) ask and answer questions, contribute to discussion and group activities
- 2) submit literature review questions and thoughtful peer-reviews
- 3) identify, share, attend, participate in, and review out-of-class seminars, lectures, or other on-campus activities relevant to spectroscopy.

## Teaching Policies & Resources – Syllabus Insert

### Administrative Home

The College of Liberal Arts and Sciences (CLAS) is the administrative home of this course and governs its add/drop deadlines, the second-grade-only option, and other policies. These policies vary by college (<https://clas.uiowa.edu/students/handbook>).

### Electronic Communication

Students are responsible for official correspondences sent to their UI email address (uiowa.edu) and must use this address for all communication within UI ([Operations Manual, III.15.2](#)).

### Accommodations for Disabilities

UI is committed to an educational experience that is accessible to all students. A student may request academic accommodations for a disability (such as mental health, attention, learning, vision, and physical or health-related condition) by registering with Student Disability Services (SDS). The student should then discuss accommodations with the course instructor (<https://sds.studentlife.uiowa.edu/>).

### Nondiscrimination in the Classroom

UI is committed to making the classroom a respectful and inclusive space for all people irrespective of their gender, sexual, racial, religious or other identities. Toward this goal, students are invited to optionally share their preferred names and pronouns with their instructors and classmates. The University of Iowa prohibits discrimination and harassment against individuals on the basis of race, class, gender, sexual orientation, national origin, and other identity categories set forth in the University's Human Rights

policy. For more information, contact the Office of Equal Opportunity and Diversity at [diversity@uiowa.edu](mailto:diversity@uiowa.edu) or [diversity.uiowa.edu](http://diversity.uiowa.edu).

#### Academic Integrity

All undergraduates enrolled in courses offered by CLAS have, in essence, agreed to the College's [Code of Academic Honesty](#). Misconduct is reported to the College, resulting in suspension or other sanctions, with sanctions communicated with the student through the UI email address.

#### CLAS Final Examination Policies

The final exam schedule for each semester is announced around the fifth week of classes; students are responsible for knowing the date, time, and place of a final exam. Students should not make travel plans until knowing this final exam information. No exams of any kind are allowed the week before finals.

(<https://clas.uiowa.edu/faculty/teaching-policies-resources-examination-policies>.)

#### Making a Complaint

Students with a complaint should first visit with the instructor or course supervisor and then with the departmental executive officer (DEO), also known as the Chair. Students may then bring the concern to CLAS (<https://clas.uiowa.edu/students/handbook/student-rights-responsibilities>).

#### 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 must uphold the UI mission and contribute to a safe environment that enhances learning. Incidents of sexual harassment must be reported immediately. For assistance, definitions, and the full University policy, see <https://osmrc.uiowa.edu/>.