CHEM:5108 Spectroscopy

Instructor: Professor M. Lei Geng
W176 CB, Department of Chemistry
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Lectures: 8:00 – 9:15 am, Tuesdays and Thursdays, 114 BHC

Drop-in Hours: 9:30 – 11:30 am, Tuesdays and by appointment, W176 CB
Appointments are welcome. Email me to set up an appointment. You are also welcome to
drop by my office to talk about any questions you have about the course materials.

Chemistry DEO: Professor Leonard MacGillivray, E331 CB, email: len-macgillivray@uiowa.edu

Reference Books:
Daniel C. Harris and Michael D. Bertolucci, *Symmetry and Spectroscopy: An Introduction to Vibrational
and Electronic Spectroscopy*, Dover Publications.
Learning.

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.

Course Description:
The objective of CHEM:5108 Spectroscopy is to discuss the methodologies of optical spectroscopy
and their current applications in chemistry. Through the course, the student will gain a thorough
understanding of spectroscopic methods, including their principles, instrumentation and data
interpretation.

Course topics will cover (1) the fundamentals of optics, including geometric and physical optics, and
optical components, (2) spectroscopic instrumentation, including light sources, spectrometers, and
detectors, (3) spectroscopic methods, including scattering, absorption and emission spectroscopy,
and optical imaging. The course will introduce students to current applications of analytical
spectroscopy, and will heavily involve the current literature.

Learning Objectives:
(1) Understand the fundamental principles, instrumentation, and methodology of spectroscopy
(2) Critically read and evaluate scientific literature
(3) Make effective scientific presentations

Course Web Site:
Course materials will be available on the CHEM:5108 ICON site. Course syllabus, announcements,
lecture notes and grades are posted on the site. Submission of course assignments will also be
through the course ICON site.
Grading:

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

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Homework</td>
<td>30%</td>
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<tr>
<td>Presentation</td>
<td>25%</td>
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<tr>
<td>Exams</td>
<td>30%</td>
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<tr>
<td>Participation</td>
<td>15%</td>
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(1) Homework: Three homework assignments will be given during the semester. The first two homework assignments will be based on lecture materials. The third homework assignment will be a summary of a research article selected from the current spectroscopy literature.

(2) Exams: There will be two exams in the course.

- First exam (in-class, Oct. 6): 15%
- Second exam (take-home, a weekend TBD): 15%

The first exam will be in-class and is based on course materials including the lectures and homework assignments. The second exam will be take-home and will be based on a research article in the current literature. You will have 48 hours to read and understand the research article and answer questions related to the article.

(3) Presentation: At the end of the semester, each student will give a presentation on a topic of spectroscopy. These topics will be presented at a class mini-symposium scheduled for the final weeks of the semester (Nov. 14, Nov. 28 and Dec. 5).

(4) Class participation: Quality and quantity of in-class participation will be evaluated holistically. You are encouraged to ask and answer questions, and contribute to discussion during lectures and class presentations. Groups of students will lead class discussions of research articles (one article per group). The discussions will be a component of the participation score.

Student Expectations:

(1) All students are expected to enjoy spectroscopy.

(2) All students are expected to attend all lectures and class presentations.

(3) Students are encouraged to learn course materials together as discussions are known to enhance learning. Once the learning is completed, all submitted assignments should be done individually.

(4) For the second exam, students can consult any materials available, including the reference books, lecture notes, problem sets and internet resources. However, students are expected to work independently and will not consult anyone else or discuss the exam with each other.
College of Liberal Arts and Sciences (CLAS) Course Policies

Course Home

The College of Liberal Arts and Sciences (CLAS) is the home of this course, and CLAS governs the policies and procedures for its courses. Graduate students, however, must adhere to the academic deadlines set by the Graduate College.

Academic Honesty and Misconduct

All students in CLAS courses are expected to abide by the CLAS Code of Academic Honesty. Academic misconduct must be reported to the Graduate College according to Section F of the Graduate College Manual.

Student Complaints

Students with a complaint about a grade or a related matter should first discuss the situation with the instructor and/or the course supervisor (if applicable), and finally with the Director or Chair of the school, department, or program offering the course.

Students should contact the CLAS Associate Dean for Graduate Education and Outreach and Engagement when additional support is needed.

Communication: UI Email

Students are responsible for all official correspondences sent to their UI email address (uiowa.edu) and must use this address for any communication with instructors or staff in the UI community.

University Policies

Accommodations for Students with Disabilities
Basic Needs and Support for Students
Classroom Expectations
Exam Make-up Owing to Absence
Free Speech and Expression
Mental Health
Military Service Obligations
Non-discrimination
Religious Holy Days
Sexual Harassment/Misconduct and Supportive Measures
Sharing of Class Recordings