CHEM:2021 Fundamentals of Chemical Measurements
Fall 2020

Instructor: Professor Max Lei Geng
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Office Hours: 12:30 – 2:00 pm, TTh (Delivery modality: through Zoom meetings)
or by appointment

Lectures: 8:30 – 9:20 am, TTh
(Delivery modality: Online/asynchronous delivery – Lecture videos are posted on ICON and can be viewed any time.)

Labs: Section 0A01: 9:30 – 12:20 pm, TTh, E440 CB
Section 0A02: 2:00 – 4:50 pm, TTh, E440 CB
(Delivery modality: in person)

Textbooks: Quantitative Chemical Analysis, 10th edition (2020); Daniel C. Harris and Charles A. Lucy
W. H. Freeman & Co.
Laboratory manual provided on ICON.

Course Web Site: http://icon.uiowa.edu; CHEM:2021:0AAA Fall20 Fundamentals of Chemical Measurements
Course syllabus, schedule, policies, lecture notes, announcements, answer keys to assignments and exams, and grades are posted on the course ICON site. The entire laboratory manual is available on the course web site.

Course Objective:
The objective of this course is to build the foundation for making chemical measurements in the laboratory. The course will emphasize measurement theory, practical laboratory skills and laboratory safety. Course topics include volumetric analysis, spectrophotometry, chromatographic separations, mass spectrometry, standardization, calibration, error analysis, hypothesis testing, modeling, graphical representation and discussion of results.

Basic Schedule:
The course is divided into lecture and laboratory sections. Lectures will cover basic principles of the experiments and the associated data analysis. The laboratory will provide the practical setting for conducting the experiments and building laboratory skills. Initial course materials will focus on general procedures for analyzing and presenting data along with learning basic laboratory skills. Basic instrumental measurements are featured in later class assignments and experiments.
Delivery Modalities for the Course:

Our course will meet both virtually and in person. All lectures will be available on course ICON site and can be viewed any time at your convenience.

The labs will be through face-to-face instruction (F2F), in Room E440 CB. You will attend the lab period specified on your personal schedule in MyUI, 9:30 am TTh for Section 0A01, and 2:00 pm for Section 0A02. You will be attending your lab rotation for a week, and then off for a week.

All office hours will be conducted online, through Zoom meetings.

Policy on Class Attendance:

Students are required to attend and arrive promptly for each laboratory session. Arriving late to laboratory sessions will result in deduction in lab performance scores. Watching the lectures is required, as they cover the central concepts of the course materials.

In the case of an excusable absence (e.g. illness, mandatory religious obligation, certain University activities, or unavoidable circumstances), a completed Explanatory Statement of Absence form must be provided to the instructor in advance of foreseeable absences or within 72 hours of unforeseeable absences.

Missed laboratory sessions or exams can be made up only if the absence is excused. Lab reports for make-up laboratories will be due one week from the date the make-up lab is completed.

University Policies Regarding Instruction during COVID:

Class Behavioral Expectations
Students are expected to comply with University policies regarding appropriate classroom behavior as outlined in the Code of Student Life. This includes the policies and procedures that all students have agreed to regarding the Steps Forward for Fall 2020 in response to the COVID-19 pandemic. Particularly, all students are required to wear a face covering when in a UI building, including a classroom. In addition, the density of seats in classrooms has been reduced. In some instances, this will allow 6 feet or more of distance while in other cases, it may be less. Regardless, wearing a face covering and maintaining as much distance as possible are vital to slowing the spread of COVID-19. In the event that a student disrupts the classroom environment through the failure to comply with the reasonable directive of an instructor or the University, the instructor has the authority to ask that the student immediately leave the space for the remainder of the class period. Additionally, the instructor is asked to report serious or repeated incidents to the Office of Student Accountability for the possibility of additional follow-up.

Class Recordings: Privacy and Sharing
Some of the sessions of a course could be recorded or live-streamed. Such recordings/streaming will only be available to students registered for this class. These recordings are the intellectual property of the faculty, and they may not be shared or reproduced without the explicit, written consent of the faculty member. Further, students may not share these sessions with those not in the class or upload them to any other online environment. Doing so would be a breach of the Code of Student Conduct, and, in some cases, a violation of the Federal Education Rights and Privacy Act (FERPA).
Grading:

The final grades in the course will be based on 5 laboratory experiments, spreadsheet tutorial and assignment, and seven online quizzes. The course components are scored as follows:

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Assignment</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Spreadsheet tutorial</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>Spreadsheet assignment</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>Lecture participation</td>
<td>20</td>
</tr>
<tr>
<td>1</td>
<td>Safety training</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Prelab and notebook preparation (2 points each)</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Data recording (2 points each)</td>
<td>10</td>
</tr>
<tr>
<td>5</td>
<td>Laboratory performance (10 points each)</td>
<td>50</td>
</tr>
<tr>
<td>4</td>
<td>Lab reports (100 points each)</td>
<td>500</td>
</tr>
<tr>
<td>7</td>
<td>Quizzes (30 points each)</td>
<td>210</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>950</td>
</tr>
</tbody>
</table>

Final Grade Assignment:

The course grades will be assigned according to the following grading scales.

- A range 90-100%
- B range 80-90%
- C range 70-80%
- D range 60-70%
- F range < 60%

The lower limits for letter grades may be adjusted, but will never be raised. For example, the A range for final grades may be adjusted to 88-100%, but will not be 95-100%. Plus/minus grades will be assigned.

A student must turn in four or more laboratory reports in order to pass the course. Submission of fewer than four (4) lab reports will automatically result in a failure in the course.

Late Submission of Assignments:

Assignments are due at 11:59 p.m. on the specified due date. Deductions will be made in grading late assignments for 10 points per calendar day after this deadline.
Examinations:

There will be 7 online quizzes in the course. Five of the quizzes will each cover the materials of an experiment performed in the lab, and the other two will cover statistical methods of chemical measurements. The quizzes will focus on materials presented in both the lecture and laboratory portions of the course. Each quiz will be cumulative relative to the statistics and data analysis materials presented in the lecture portion of the course.

Regrading:

Adjustments to grades will only be considered within one week after an assignment or exam is returned. The re-grade request must be made to Prof. Geng and accompanied by a written, detailed description of the grading concern using Regrade Request Form on ICON. Regrading will involve re-assessment of the entire assignment and may increase or decrease the grade.

Laboratory Performance:

Learning how to make chemical measurements is a central component of this laboratory course. Points are assigned to each experiment to assess the laboratory performance including observation of laboratory safety, timeliness, laboratory skills, proper cleanup, and appropriate handling of chemicals and wastes.

Laboratory Notebooks:

Each student must maintain a laboratory notebook. Specific instructions for keeping notebooks will be discussed in class and provided on ICON. Points in the class grade are allocated for the completion of the notebook entries.

Lab Reports:

A lab report must be completed and turned in for each experiment. Required report contents are detailed at the end of each experiment information package. Reports must be prepared using the Microsoft Excel templates provided. All reports must be submitted via the Assignments module on ICON. It is the student’s responsibility to ensure that your completed assignments are successfully submitted on time; this may be done through an email confirmation from ICON.

Laboratory Safety:

Safety is a primary concern in chemistry laboratories and you will be expected to act in a safe and professional manner. Laboratory safety practices will be discussed in detail in lectures and safety guidelines are provided on course ICON site. Eye protection is mandatory. Standard laboratory goggles are required and must be worn at all times, even if you are not actually performing an experiment. Lab coats and gloves are optional. Open toe shoes and shorts are not allowed in the lab. Face masks must be worn at all times in the laboratory.

Computer Usage:

Each student will have access to computers in the departmental computer facility located in W241 CB for the entire semester. Computers will also be available in the laboratory where the experiments are conducted (E440 CB).
Equipment Policy:

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. On the day of check-in, the student must be certain 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. 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. All pieces of glassware or equipment that are missing, broken, or not in good working order will be charged to the student through the University billing system after the close of the semester.

Accommodations for Disabilities:

Please inform me if you have a disability which requires seating modifications, testing accommodations or accommodations of other class requirements, and we will make appropriate arrangements for you. Please contact me as soon as possible.

Policy on Plagiarism:

All work performed in this course is expected to be your own. If you have questions regarding an experiment, see the instructor or the TAs for help. We encourage you to discuss course materials with each other, but all submitted assignments should be completely your own work. In grading the assignments and lab reports, the instructors will be looking for evidence of collusion. If such evidence is found, all parties involved will receive no credit for the assignment. These principles also apply to the use of graded lab reports from previous years.

You will receive no credit if it is determined that the work you turn in is not your own. For College of Liberal Arts and Sciences policies, see the CLAS Code of Academic Honesty in the Academic Policies Handbook: http://clas.uiowa.edu/students/handbook/academic-fraud-honor-code.
Department of Chemistry Policies Regarding Lab Courses for Fall 2020

To provide a safe working space, both in terms of the hazards associated with working in the laboratory and minimizing personal interactions during a pandemic, we are requiring compliance with the following guidelines in the laboratory:

- Anyone entering the laboratory space is required to wear goggles as well as a face shield and face mask while in the laboratory. Students will be notified if there are situations where a face mask should not be worn.

- Loaner/replacement PPE will not be provided/available.

- Anyone entering the laboratory will use hand sanitizer after passing through the doors into the teaching lab. Sanitizer will be provided at the AMAG entry door, which will be marked.

- Entry to the lab will only be through the Maglock doors. Exit through the non-maglock door. These will be marked for clarity.

- Students will be assigned a workspace during the laboratory period. Students are expected to stay in their assigned space and maintain a 6 ft distance from others in the laboratory as much as possible.

- Gloves will be made available when needed as part of the required PPE for an experiment.

- When using shared equipment, do not congregate while waiting your turn – the TAs and monitors will help manage the access to these spaces.

- **Students must wipe down their work space and any equipment and glassware before leaving the laboratory.** Sanitizing solution and paper towels will be provided for this purpose.

The consequences of not following the guidelines are immediate dismissal from the laboratory and a grade of zero for the experiment.
College of Liberal Arts and Sciences
Information for Undergraduates

Absences and Attendance
Students are responsible for attending class and for contributing to the learning environment of a course. Students are also responsible for knowing their course absence policies, which will vary by instructor. All absence policies, however, must uphold the UI policy related to student illness, mandatory religious obligations, including Holy Day obligations, unavoidable circumstances, or University authorized activities (https://clas.uiowa.edu/students/handbook/attendance-absences). Students may use this absence form to aid communication; the instructor will decide if the absence is excused or unexcused (Explanatory Statement of Absence).

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 (https://clas.uiowa.edu/students/handbook/academic-fraud-honor-code).

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 is then responsible for discussing specific accommodations with the instructor. More information is at https://sds.studentlife.uiowa.edu/.

Administrative Home of the Course
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 related policies. Other colleges may have different policies. CLAS policies may be found here: https://clas.uiowa.edu/students/handbook.

Communication and the Required Use of UI Email
Students are responsible for official correspondences sent to the UI email address (uiowa.edu) and must use this address for all communication within UI (Operations Manual, III.15.2).
Complaints
Students with a complaint about an academic issue should first visit with the instructor or course supervisor and then with the Chair of the department or program offering the course; students may next bring the issue to the College of Liberal Arts and Sciences. For more information, see https://clas.uiowa.edu/students/handbook/student-rights-responsibilities.

Final Examination Policies
The final exam schedule 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 information. No exams of any kind are allowed the week before finals. Visit https://registrar.uiowa.edu/final-examination-scheduling-policies.

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 (diversity.uiowa.edu).

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, please see https://osmrc.uiowa.edu/.