

Syllabus CHEM 396/455 Spring Semester 2020

Advanced Analytical Chemistry

Prerequisite: CHEM 222 or 224, Junior or Senior standing. Restricted to BIOCHEM and CHEM students.

Instructor: Dr. Martina Schmeling; Flanner Hall 408, phone: 508-3124, e-mail: mschmel@luc.edu.

Description:

The course will cover a wide range of topics in analytical chemistry starting with sampling and sample preparation methods for a variety of analytes. After that different analytical methods for characterization and quantification will be introduced and their strengths and limitations discussed along with quality control and quality assurance practices. The remaining part of the semester will be devoted to applications of analytical chemistry in science and industry such as detecting and quantifying environmental toxins, trace elemental analysis of food and drugs, and process control in microelectronics manufacturing.

Topics:

Sampling and sample preparation:

- Representative sampling
- Common sample preparation methods

Analysis:

- Figures of merit
- Analytical methods

Data and Results:

- Method validation and quality control
- Chemometrics

Applications:

- Archeometry and Forensics (paintings, sculptures, manuscripts, fibers, glass)
- Biological (blood, serum, tissue, bones, metabolites)
- Environmental and Geological (air, water, soil, rock, waste)
- Industrial (oil, gas, pharmaceuticals, food, microelectronics)

Class procedure:

Classes are meeting **Monday, Wednesday and Fridays from 8:15-9:05AM** in **Flanner Hall 105**. **Three in-class exams** are scheduled for the semester (**February 7, March 11, and April 17**). The average of the two highest scoring exams will be counting 40% of the total grade. There will be **no make-up** exams. A final exam paper on a given topic will count 40% of the grade. The final

exam paper will be due on **April 27, 2020**. Details regarding all exams and the final paper will be announced once the date approaches. Class participation is important and will count for 20% of the final grade. **Office hours** are scheduled for **Wednesday from 10:00 -11:00AM and Friday from 9:30-10:30AM or by appointment**. Students are encouraged to communicate with the instructor regularly. Course material such as power point presentations and supportive information will be posted on Sakai.

Grading:

The **average of the top two scoring in class exams** counts **40%** of the total grade.

Participation in the three in-class exam is mandatory and **no make-up exams** will be given. If a student misses for any reason one in-class exam, the average of the two remaining in-class exams will be taken and accounts for 40% of the final grade.

The **final exam** paper (due April 27, 2020) counts **40%** of the total grade.

Class participation counts **20%** of the total grade.

Grading Scale in %

100-94%	A
93-88%	A-
87-85%	B+
84-79%	B
78-75%	B-
74-71%	C+
70-64%	C
63-60%	C-
59-50%	D
<50%	F

Office Hours:

Office hours are scheduled for **Wednesday from 10:00AM to 11:00AM and Friday from 9:30-10:30AM**. My office is located in **Flanner Hall, 4th floor, room 408**.

Academic Integrity:

All students are expected to perform the highest level of academic integrity while taking exams and must read and abide by the demanding standard of personal honesty, drafted by the College of Arts and Sciences. This can be found at:

<http://luc.edu/media/lucedu/cas/pdfs/academicintegrity.pdf>. It is your responsibility to read this and behave correspondingly. Anything you submit that is incorporated as part of your grade in this course must represent your own work. **Any students caught cheating will, at the very minimum, receive a grade of “zero” for the item that was submitted and this grade cannot be dropped**. If the cheating occurred during a course exam the incident will be reported to the

Chemistry Department Chair and the Office of CAS Dean. Depending on the seriousness of the incident, additional sanctions may be imposed.

Student Accommodations:

Students seeking academic accommodations for a disability must meet with the Student Accessibility Center (SAC) to verify the disability and to establish eligibility for accommodations. Students may visit SAC in Sullivan Center - Suite 117, call 773-508-3700, email sac@luc.edu, or visit <https://www.luc.edu/sac/about/> to begin the process. Students are encouraged to contact SAC as early in the semester as possible.

Students with Co-Curricular Activities:

Students missing classes while representing Loyola University Chicago in an official capacity (e.g. intercollegiate athletics, debate team, model government organization) are allowed to make up any assignments and will receive any information distributed in the missed classes either electronically or as hardcopy. Students have to provide proper documentation describing the reason for and the date(s) of the absence and this documentation has to be signed by the instructor before the absence occurs. The student missing a class or assignment is responsible for making up that assignment at the time negotiated with the instructor.
(<https://www.luc.edu/athletheadvising/attendance.shtml>)

Course Repeat Rule:

Effective with the Fall 2017 semester, students are allowed only THREE attempts to pass Chemistry courses with a C- or better grade. The three attempts include withdrawals (W). After the second attempt, the student must secure approval for a third attempt. Students must come to the Chemistry Department, fill out a permission to register form or print it from the Department of Chemistry and Biochemistry website: <http://www.luc.edu/chemistry/forms/> and personally meet and obtain a signature from either the Undergraduate Program Director, Assistant Chairperson, or Chairperson in Chemistry. A copy of this form is then take to your Academic Advisor in Sullivan to secure final permission for the attempt.

Accommodations for Religious Reasons:

Students who observe religious holidays, which will cause missing class or otherwise effect performance in the class must alert the instructor within 10 calendar days of the first class meeting of the semester to request special accommodations, which will be handled by a cases by case basis.