

## Syllabus CHEM 395/455 Fall Semester 2015

### *Advanced Analytical Chemistry*

Instructor: Dr. Martina Schmeling; Flanner Hall 408, phone: 508-3124, e-mail: [mschmel@luc.edu](mailto: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 and applications. 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 process control in food and drug production and detecting and quantifying environmental toxins.

#### *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 (art and cultural heritage)
- Biological (blood, serum, tissue, bones, metabolites, urine etc.)
- Environmental (air, water, soil, waste etc.)
- Forensic (fibers, glass, DNA/RNA etc.)
- Geological (ore, oil, gas)
- Pharmaceutical and Food (beverages, drugs, fruits and vegetables etc.)

Class procedure: Classes are meeting **Tuesdays and Thursdays from 8:30-9:45AM** in

Flanner Hall 105. Three in-class exams are scheduled for the semester (September 22, October 22, and November 19). The average of the two highest scoring exams will be counting 50% 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 December 8, 2015. Details regarding all exams and the final paper will be announced once the date approaches. Class participation is important and will count for 10% of the final grade. Office hours are scheduled for Tuesday and Thursday from 10:00am to 11:00am or by appointment. Course material such as power point presentations and supportive information will be posted on Sakai.

Grading:

Average of the two in-class exams	50%
Final exam paper (due December 8, 2015)	40%
Class Participation	10%

Grading Scale:

A:	93% -100%	A-:	87- 92%
B+:	83-86%	B:	78-82%
B-:	74-77%	C+:	69-73%
C:	65-68%	C-:	61-64%
D+:	56-60%	D:	50-55%
F:	0 to 49%		