



Course Outline

Chemistry 9544B (Winter 2025/26)

Mass Spectrometry: Fundamentals and Biochemical Applications

Instructor

Lars Konermann

Office B&G 2016

E-mail: konerman@uwo.ca

Evaluation

Problem Assignments: 15 % (there will be about 3 assignments)

Final Exam: 45 %

Seminar presentation: 40 % (peer evaluation)

Lectures

Tentatively scheduled for Monday, 3:30 – 5:30 p.m. in room ChB 115

Course Description

Topics covered include the following - Ionization techniques: Focus on electrospray ionization (ESI), but others will be briefly covered as well: MALDI, EI, CI, APCI. Ion fragmentation by CID, SID, IRMPD, ECD, ETD. Mass analyzers: time-of flight, quadrupoles, ion cyclotron resonance instruments and orbitraps. Ion mobility spectrometry. Hybrid systems. Biochemical applications (many of these may be covered in seminar presentations given by students – one presentation for each participant): Native ESI-MS, LC-MS, drugs and metabolites, peptides and proteins, protein identification and other proteomics techniques, H/D exchange, protein charge state distributions, covalent and noncovalent modifications.

Text

There is no textbook for this course. Detailed notes and references to the scientific literature will be provided.

Learning Outcomes

Upon completion of this course, students will be able to:

- Understand the basic concepts of mass spectrometry;
- Have a good grasp of different mass analyzers, ionization techniques, and fragmentation techniques;
- Understand that mass spectrometry can help solve a wide range of problems, from fundamental research to applied areas, in academia, government laboratories, and industry;
- Make sense of the “alphabet soup” of acronyms that is commonly encountered when mass spectrometrists talk to each other.

And a few mandatory disclaimers ...

Accessibility Statement

Please contact the course instructor if you require material in an alternate format or if you require any other arrangements to make this course more accessible to you. You may also wish to contact Services for Students with Disabilities (SSD) at 661-2111 x 82147 for any specific question regarding an accommodation.

Prerequisites and Antirequisites

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites. For details specific to this course, please consult the current Western Academic Calendar.

Students who are in emotional/mental distress

should refer to Mental Health@Western <http://www.uwo.ca/uwocom/mentalhealth/> for a complete list of options about how to obtain help.

Students Seeking Academic Accommodations

based on medical (physical or mental) illness should begin by contacting the Academic Counsellors of their home faculty. Please visit the following link for policy on Accommodation for Illness:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf