

CHM 6159: Mass Spectrometry Methods

Fall Semester 2017 (3 credits)

Instructor:	Nicolas Polfer, CLB 311C, polfer@chem.ufl.edu
Office hours:	M 9 (4:05-4:55 pm), W 4 (10:40-11:30 am) & F 7 (1:55-2:45 pm)
Lectures:	M W F 8th period (3:00-3:50 pm) Leigh 104
Aims:	To provide students with a solid understanding of modern mass spectrometry, including fundamentals, instrumentation and applications.
Text book:	Mass Spectrometry: A Textbook by Jürgen H. Gross; Springer (2011), 2 nd Edition. \$100.11 (Amazon) (G)
Exams:	The mid-term exam takes place on Oct 19st in class. The contribution to the grade is 20% . The final exam takes place on Dec 15th 7:30-9:30 am . The contribution to the grade is 40% .
Critical review:	Each student is expected to give a short oral presentation (10 min) on an area of mass spectrometry not covered in class (at least up to that point). This "critical review" should focus on 1-2 research papers. The exercise will be graded based on the ability of communicating and critiquing the material. A choice on the topic of the presentation should be made by Nov 6 in consultation with Dr Polfer. The oral presentations will take place toward the end of the semester (<u>13th Nov – 20th Nov</u>). The presentation counts 30% towards the overall grade.
Problem sets:	Problem sets will be made available throughout the semester. These count 10% towards the overall grade.
Course policies:	Attendance will not be recorded, but participation in lectures and demonstration periods is important in assimilating the course material. Any request for make-up exams should be made to Dr. Polfer as far in advance as possible. Students should also familiarize themselves with the UF Student Honor Code posted on the web at www.chem.ufl.edu/~itl/honor.html . Students with disabilities must first register with the Dean of Students Office, see http://www.chem.ufl.edu/~itl/disabilities.html ; the Dean of the Students Office will provide

documentation to the student who must then provide this documentation to the instructor when requesting accommodation.

For counseling, students should consult the webpage:

<http://www.chem.ufl.edu/~itl/counseling.html>

Grading:

The grade consists of three different types of assessments: exams (**mid-term** and **final**), **problem sets**, and a **presentation**.

Total = **20** + **40** + **10** + **30** = 100%

Proposed Grade Levels:

A: 92-100
A-: 88-91.9
B+: 84-87.9
B: 80-83.9
B-: 76-79.9
C+: 72-75.9
C: 68-71.9
C-: 64-67.9
D+: 60-63.9
D: 56-59.9
D-: 52-55.9
E: < 52

Tentative Lecture Schedule CHM 6159

Date	Lecture #	Topic	Textbook
M 08/21		<i>No class - conference</i>	
W 08/23	1	Brief history of MS and overview	
F 08/25	2	Fundamentals of ions	G Ch. 2.1-2.5.4
M 08/28	3	Mass spectra and isotopes	G Ch. 3
W 08/30	4	SIMION tutorial	
F 09/01	5	Instrumentation: time-of-flight	G Ch. 4.2
M 09/04		<i>No class – Labor Day</i>	
W 09/06		Ctd TOF lecture	
F 09/08	6	Instrumentation: magnetic sector	G Ch. 4.3
M 09/11	7	Instrumentation: quadrupole mass analyzer	G Ch. 4.4
W 09/13		Ctd QMF	
F 09/15	8	Instrumentation: Ion traps	G Ch. 4.5-6
M 09/18	9	Instrumentation: FTMS	G Ch. 4.7-8

W 09/20		FTMS ctd	
F 09/22	10	Detectors and vacuum technology	G Ch. 4.10-11
M 09/25	11	SIMION workshop	
W 09/27	12	Ionization: EI/CI	G Ch. 5,6,7
F 09/29	13	Ionization: FD, FAB, SIMS, ICP	G Ch. 8, 10, 15
M 10/02	14	Ionization: MALDI	G Ch. 11
W 10/04	15	Ionization: ESI	G Ch. 12
F 10/06		<i>No lecture - Homecoming</i>	
M 10/9	16	Ionization: DESI & DART	G Ch. 13
W 10/11	17	High-resolution MS	
F 10/13		Ctd high-resolution	
M 10/16		Mid-term exam (up to 10/04)	
W 10/18		Exam review	
F 10/20	18	Fundamentals & Tandem mass spectrometry	G Ch. 9
M 10/23	19	Separation: GC & LC	G Ch. 14
W 10/25	20	Separation: CE & SDS-PAGE	
F 10/27	21	Example critical review of a paper	
M 10/30	22	Tandem MS worksheet	
W 11/01	23	Proteomics (Dr Kari Basso)	
F 11/03	24	Quantitative, top down proteomics	
M 11/06	25	Ion mobility	
W 11/08	26	Non-covalent interactions, H/D exchange	
F 11/10		<i>No Lecture – Veteran's Day</i>	
M 11/13		Student presentations	
W 11/15		Student presentations	
F 11/17		Student presentations	
M 11/20		Student presentations	
W 11/22		<i>No Lecture - Thanksgiving</i>	
F 11/24		<i>No Lecture - Thanksgiving</i>	
M 11/27	27	Metabolomics (Dr Tim Garrett)	
W 11/29	28	Imaging MS (Dr Tim Garrett)	
F 12/01	29	History of QQQ (<i>Dr Rick Yost</i>)	
M 12/04	30	Review of guest lectures	
W 12/06		Ctd guest lectures	