

Instructor: Dr. Leslie Meadows Frost 464S (Office); 401S (Lab)
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Office Hours: I am always happy to assist at any time when I am in my office. Official office hours will be: MWF 9-10 and T 9-11

Statement of Course: This course investigates the theory and applications of mass spectrometry. It includes a laboratory component in which you will learn to run the mass spectrometers and interpret mass spectral results.

Course Objectives: By the end of this course you will be familiar with the theory of how all of the different components of a mass spectrometer operate. You will also be able to operate the mass spectrometers here at Marshall, analyze and interpret mass spectral results, and design your own mass spectrometry experiments.

Prereqs: C or better in CHM 356

University Policies: By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to www.marshall.edu/academic-affairs/policies/.

Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment

Required Text and Materials:

1. Free Textbook: The expanding role of Mass Spectrometry in Biotechnology by Gary Siuzdak
https://masspec.scripps.edu/landing_page.php?pgcontent=publications
2. Access to MU Online and a Marshall email account
3. Scientific calculator for exams and homework

We will also be following the information found at <http://masspec.scripps.edu/> throughout the course of the semester. In addition, all of my lecture notes for the entire semester will be posted on MUonline.

Attendance Policy: Attendance is not mandatory for this course, except for exam days and lab exercises. However, students make much better grades in this course if they attend class regularly.

Topics:

Introduction to Mass Spectrometry
Isotope Abundances
Ionization Sources
Mass Analyzers
Detectors
Vacuum Systems
Separation/mass spectrometry
MS/MS
EI Fragmentation
Biological Applications

Your grade will be determined as follows:

Exam 1	Feb. 7 th	25%
Exam 2	March 14 th	25%
Exam 3	April 30 th at 10:15 AM	25%
Lab Exercises and Homework		25%

Exam dates are approximate. You will be given 1 week prior notice before all exams. You must have a university excuse for missing an exam to be able to take a make-up exam. The make-up date will be May 2nd at 10 AM. Talking to each other and/or sharing calculators is not permitted during an exam. You cannot have your cell phone out during exams. If you are caught with a cell phone during the exam, then it will be assumed that you are cheating. You cannot leave the room for any reason while taking an exam. If you are caught cheating on any exam, you will automatically receive a grade of 0% for that exam.

Grading Scale:

90-100	A	80-89	B
70-79	C	60-69	D
Below 60	F		

Homework: Each student is to prepare for each class by reading the material covered in the previous class, answering the relevant problems at the end of each chapter, and previewing the material to anticipate the next class lecture. Additional homework problems will be given out throughout the semester, some of these will be turned in for a grade.

Laboratory Component of Course: We will be conducting some online mass spectrometry based lab exercises throughout the semester. Most of these can be conducted on your own time (you will need access to the internet), but I will be available for assistance with these labs. There will be material from the lab exercises which will be turned in for a grade. In addition, you will have the opportunity to run the three mass spectrometers here at Marshall. All handouts for laboratory exercises will be posted online. Labs will be run on Fridays during class time and/or by appointment. As graduate students, you will be required to perform additional laboratory exercises to receive 4 credits for the course.

Miscellaneous Topics

- **Academic Dishonesty:** Marshall University's academic honest policy (<http://www.marshall.edu/academicaffairs/Academic%20Dishonesty%20Policy.pdf>) will be enforced. Any student caught cheating in this course will receive 0 points on that assignment or exam.
- **"Policy for Students with Disabilities:** Marshall University is committed to equal opportunity in education for all students, including those with physical, learning and psychological disabilities. University policy states that it is the responsibility of students with disabilities to contact the Office of Disabled Student Services (DSS) in Prichard Hall 117, phone 304 696-2271 to provide documentation of their disability. Following this, the DSS Coordinator will send a letter to each of the student's instructors outlining the academic accommodation he/she will need to ensure equality in classroom experiences, outside assignment, testing and grading. The instructor and student will meet to discuss how the accommodation(s) requested will be provided. For more information, please visit <http://www.marshall.edu/disabled> or contact Disabled Student Services Office at Prichard Hall 11, phone 304-696-2271."
- If a test falls on a day that is cancelled by the university (e.g. a snow day), the test will occur on the next period the class meets.
- Please turn off cell phone ringers before class. Failure to do so may result in you being removed from the room, even during a test. You cannot have a cell phone out when taking an exam.
- You may not record my lectures without my permission and under no circumstances may they be posted, transferred, or reproduced to any form of media (Internet, print, television, and the like) without my permission.

A) There are many online sites that contain great reference material that would benefit the students taking this course. A few of these sites are:

- 1) <http://masspec.scripps.edu/>
- 2) <http://www.chem.arizona.edu/massspec/>
- 3) <http://www.ionsource.com/>
- 4) <http://science.widener.edu/svb/massspec/massspec.pdf>
- 5) <http://www.asms.org/whatisms/>

B) I will be posting relevant journal articles for the students on MUonline. Here is an example article:

<http://pubs.acs.org/doi/abs/10.1021/ar00175a002>