

**Chemistry 910: Special Topics in Analytical Chemistry**  
**Mass Spectrometry: Instrumentation and Applications**

Professor R. Kenneth Marcus

Department of Chemistry

4:00 – 6:30 Wednesday, 158 Hunter Laboratories

Text: “Fundamentals of Contemporary Mass Spectrometry”, C. Dass; John Wiley & Sons, 2007, ISBN - 978-0-471-68229-5

“Mass Spectrometry: Principles and Applications”, de Hoffmann and Stroobant; John Wiley & Sons, 2007, ISBN - 978-0-470-03311-1 (paperback)

The purpose of this course is to provide a solid foundation in the use of mass spectrometry for scientists and engineers of diverse backgrounds. The intention is to provide a basic understanding of how the various mass spectrometer components function and how to choose the most optimum approach to solving problems in environmental, biological, materials, and process monitoring situations. Portions of the class will be devoted to the interpretation of mass spectra and the use of mass spectrometers as highly selective detectors for chromatographic separations.

Topic	no. of lectures
Concepts and context	
History, fundamental units, vacuum technology	2
Mass Analyzers	
Historical, charged particle optics, analyzers, tandem mass spectrometry, detectors	3
Ionization Techniques	
Electron impact, chemical ionization, desorption ionization, plasma sources	4
Mass Spectral Interpretation	
Basic electron impact, CID spectra, proteomics	2
Hyphenated Methods and Applications	
Gas, liquid and thin-layer chromatography	2

Course grading:

Mid-Term	30%
Final	40%

Presentation	15%
Report/homework/ in-class	15%

### **Attendance**

Attendance to all scheduled class meetings is highly recommended. Beyond the comments above relative to tests and the final examination attendance, there will be no formal role taken. As such, attendance to lectures is not required. On the other hand, class participation

### **Academic Integrity**

The following is the official statement on “Academic Integrity.”

*“As members of the Clemson University community, we have inherited Thomas Green Clemson’s vision of this institution as a ‘high seminary of learning.’ Fundamental to this vision is a mutual commitment to truthfulness, honor, and responsibility, without which we cannot earn the trust and respect of others. Furthermore, we recognize that academic dishonesty detracts from the value of a Clemson degree. Therefore, we shall not tolerate lying, cheating, or stealing in any form.”*

Specific to this course, students will be required to sign a pledge (“I have neither given nor received help on this work, nor am I aware of such infractions by others.”). Violation of this statement will result in immediate ejection from the class with receipt of a failing (F) grade for the semester.