

CHEM 597-03X: Advanced Mass Spectrometry Techniques VI

LAB TIME AND LOCATION: Mon-Thur; SCI # 313/309/354.

INSTRUCTOR: Dr. Laurence Angel, SCI 341

Phone: 5391, Laurence.Angel@tamuc.edu

OFFICE HOURS: Mon-Fri: 9:00-10:00am.

COURSE DESCRIPTION: The course will provide students with the knowledge and skills needed to conduct advanced mass spectrometry research, collect and analyze research-quality data, and present their research through report writing and presentations. The student will become familiar with a range of mass spectrometry techniques including quadrupole - time-of-flight mass spectrometry (Q-TOF-MS), ion mobility - mass spectrometry (IM-MS) and high performance liquid chromatography - mass spectrometry (HPLC-MS). For data analysis and report writing the student will become familiar with the software MassLynx, Driftscope, Excel, SigmaPlot, and Word. Critical reading skills are needed to understand research papers and to develop your own technical writing skills using the Web of Knowledge and Endnote for searching and collecting scientific literature. The student will also present their research using a PowerPoint presentation at a group meetings and/or a research conference. These skills are important aspects for recording and disseminating scientific knowledge.

STUDENT LEARNING OUTCOMES: Students will show the necessary skills involved in conducting instrumental-based mass spectrometry research by developing their knowledge and skills for conducting Q-TOF-MS, IM-MS, HPLC-MS, fluorescence, and ultraviolet-visible (UV-Vis) spectrophotometry. Outcomes will include the development of skills for chemical database searching, critical article reading, technical writing, and oral presentations. The computational portion of the course will use the Gaussian molecular modeling program on the high performance computer cluster for exploring a range of chemical properties of molecules. Properties such as molecular geometries, collision cross sections, and metal ion binding affinities help to interpret the IM-MS results. Students will be required to complete weekly research assignments, present their research results to the professor through the submission of midterm reports and a final research report, and present their work to the research group and/or at a research conference through a PowerPoint presentation. The class is 3 semester hours.

COURSE REQUIREMENTS, ASSIGNMENTS AND GRADING

Research assignments and midterm reports: introduction to a scientific problem, literature review, and research results. Weekly assignments due to be completed each week (40%)

PowerPoint presentation: presentation of your research to instructor and research group (30%)

Final research report: comprehensive report of your summer research results including literature review, research methods, research results, discussion and bibliography (30%)

A: >85.0; **B:** 75.0 ~ 84.9; **C:** 65.0 ~ 74.9; **D:** 55.0 ~64.9; **F:** <55.0

TECHNOLOGY REQUIREMENTS**LMS**

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here: <https://community.brightspace.com/support/s/contactsupport>

Course Schedule

Week	Subject
1	Advanced mass spectrometry techniques
2	Quadrupole – time-of-flight mass spectrometry (Q-TOF)
3	Ion mobility – mass spectrometry (IM-MS)
4	Energy-resolved collision-induced dissociation techniques (CID)
5	Source/Trap/Transfer collision-induced dissociation techniques (MS ³ CID)
6	Date analysis techniques– MassLynx/Driftscope/SigmaPlot
7	Presentation of data/ scientific writing
8	High Performance Liquid Chromatography –Mass Spectrometry (HPLC-MS)
9	Advanced HPLC-MS and CID techniques
10	Advanced HPLC-IM-MS/MS techniques
11	Molecular Modeling using Gaussian/GaussView
12	Molecular Modeling/ IM/ molecular conformations PowerPoint Presentations
13	Analysis of collision cross-sections from theory and IM/MS
14	Date analysis techniques– MassLynx/Driftscope PowerPoint Presentations
15	Presentation of data/ scientific writing Final report due

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: [Netiquette](#)

<http://www.albion.com/netiquette/corerules.html>

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

ADA Statement

Students with Disabilities

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/)
<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.