

CHEM 416 Syllabus

Course Code	Course Name	Credits	Prerequisite(S)	Classification
CHEM 416	Applications of mass spectrometry in analytical chemistry	2	CHEM 211 CHEM 312	Elective Course

Course Description This course is designed to provide the student with the latest information regarding mass spectrometers. The principles and applications of different types of ionization methods, mass analyzers and detectors are adequately covered..

Class

Classes are held twice/week each for 50 minutes.

Scheduling

Textbook Analytical Chemistry (Gary D. Christian). 7th ed., 2014
Chemical Analysis (Francis Rouessac and Annick Rouessac), 2nd edition, 2007
Mass spectrometry, principles and applications (Edmond de Hoffmann & Vincent Stroobant), 3rd ed., 2007

Course Coordinator Dr. Taghreed Fagieh
Prof. Mohammed Alshahawy

Relationship to SOs	1	2	3	4	5	6
	X		X			X

CLOs

By the end of this course student will be able to:

CLO1. Describe the principles of different ion sources, mass analyzers and detectors used for quantitative and qualitative mass spectrometry. (SO1)

CLO2. Define the figures of merit and different calibration approaches for instrumental methods. (SO1)

CLO3. Explain various ionization, separation and detection methods employed in mass spectrometry. (SO3)

CLO4. Apply the suitable analytical procedures for different types of samples in terms of ionization and separation. (SO3)

CLO5. Interpret the mass spectrum to identify the chemical compounds. (SO3).

CLO6. Share ideas and knowledge with the class to solve problems. (SO6)

Contents

List of Topics	No. of Weeks
General introduction	2
Principle of mass spectrometer work	1
Principles on how mass spectrometer works: Ion source and ionization	5
Principles on how mass spectrometer works: analyzers	3
Principles on how mass spectrometer work; detectors	1
Analyzer's evaluation: mass range, resolution, accuracy, sensitivity	1
Tandem MS (MSMS)	1
Studying the main component of ICP/MS and ICP/OES and their applications	1
Total	15