



MUTAH UNIVERSITY
Faculty of Engineering
Department of Chemical Engineering



Principles of Instrumental Analysis Course Syllabus

Course Code	Course Name	Credits	Contact Hours
0404455	Principles of Instrumental Analysis	3	

INSTRUCTOR/COORDINATOR

Name	Eng.Bahia Maitah
Email	Bahia_76@mutah.edu.jo
Website	

TEXTBOOK

Principles of Instrumental Analysis, Skoog, Holler, Nieman, Sixth Ed.

Other Supplemental Materials

Quantitative Chemical Analysis, Daniel Harris, 8th Edition.

Fundamentals of Analytical Chemistry, Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch. Ninth Ed.

SPECIFIC COURSE INFORMATION

A. Brief Description of the Content of the Course (Catalog Description)

This course aims to introduce students to modern methods used in instrumental analysis. It includes: Sampling, Calibration, Standardization, UV, AAS, GC, HPLC, IC.

B. Pre-requisites (P) or Co-requisites (C)

0404437 (P)

C. Course Type (Required or Elective)

Required (Compulsory department course)

SPECIFIC GOALS

A. Specific Outcomes of Instruction

1. Understanding the steps associated with the identification and quantification of an analyte in the sample. [SLO 1,2,6]
2. Understanding the criteria used for selecting a particular sampling method. [SLO 1,2]
2. Understanding the criteria used for selecting a particular instrumental method. [SLO 1,2]
3. Understanding the principles behind making a qualitative and quantitative measurement in some commonly used instrumental methods. (UV, AAS, GC, HPLC, IC) [SLO 1,2]
4. Understand the basic operation of each class of instrument and the chemical or physical property they measure. [SLO 1,2]
5. Understanding the advantages and disadvantages of these methods for a particular sample. [SLO 1,2,6]
6. Be able to suggest suitable instrumental methods for selected analytical problems. [SLO 1,2]
7. Use the literature to investigate the development of instrumental methods for specific sample types. [SLO 1,2,6]

B. Student Outcomes Addressed by the Course

1	2	3	4	5	6	7				
✓	✓				✓					

BRIEF LIST OF TOPICS TO BE COVERED

List of Topics	No. of Weeks	Contact Hours
Atomic Absorption Sample Atomization Techniques Atomic Absorption Instrumentation. Interferences in Atomic Absorption Spectroscopy. Atomic Absorption Analytical Techniques	1,2,3	9 hours
Ultraviolet-Visible Molecular Absorption Spectrometry Measurement of Transmittance and Absorbance. Beer's Law. The Effects of Instrumental Noise on Spectrophotometric Analyses. Instrumentation.	4,5,6	9 hours
An Introduction to Chromatographic Separations General Description of Chromatography Migration Rates of Solutes Band Broadening and Column Efficiency Optimization of Column Performance Summary of Chromatographic Relationships Applications of Chromatography	7,8	6 hours
Gas Chromatography Principles of GLC	9,10,11	9 hours

Instruments for GLC Gas Chromatographic Columns and Stationary Phases Applications of GC Advances in GC Gas-Solid Chromatography		
High-Performance Liquid Chromatography Scope of HPLC Column Efficiency in LC Instrumentation Partition Chromatography Adsorption Chromatography Ion Chromatography Size-Exclusion Chromatography Affinity Chromatography Thin-Layer Chromatography	12,13,14	9 hours
Total	14	42 hours

METHODS OF ASSESSMENT			
No.	Method of assessment	Week and Date	%
1	First Exam	6th week	25
2	Second Exam	9th week	25
3	Final Exam	End of Semester	50
Total			100