



Jordan University of Science and Technology
Faculty of Science & Arts
Chemistry Department

CHEM438 Industrial Analytical Chemistry

Summer Semester 2019-2020

Course Catalog

2 Credit Hours. This course is intended to provide basic skills in application of instrumental methods and chromatographic separations to real samples. Emphasis will be given to environmental and biomedical samples. Students will learn validation of analytical methods, sample preparation, applications of GC and HPLC and applications of atomic spectroscopic methods for compound and elemental analysis.

Text Book

Title	Principles of Instrumental Analysis (6th Edition),
Author(s)	Holler, Skoog, & Crouch
Edition	6th Edition
Short Name	Instrumental Analysis
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Quantitative Analysis	Quantitative Chemical Analysis	Daniel C. Harris	8th Edition	

Instructor

Name	Prof. Yahya Tahboub
Office Location	D3 L-0
Office Hours	
Email	tahboub@just.edu.jo

Class Schedule & Room

Section 1:

Lecture Time: Sun, Mon, Tue, Wed : 11:30 - 12:30

Room: منصة الكترونية

Prerequisites

Line Number	Course Name	Prerequisite Type
913362	CHEM336 Principles Of Chemical Instrumentation	Prerequisite / Pass
913371	CHEM337 Principles Of Chemical Instrumentation Lab	Prerequisite / Pass

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Validation of Analytical Methods: Calibration and validation of analytical methods including accuracy, precision, linearity, recovery and matrix effect.	Ch.5 From Quantitative Analysis
Week 2	Sample Preparation for Analysis of Industrial Samples: Liquid-liquid extraction, solid phase extraction, solid phase micro extraction, purge and trap extraction, acid digestion methods.	Ch.26 From Quantitative Analysis
Weeks 3, 4	Gas Chromatographic Methods: Principles of GC separations, capillary columns and packed columns, common injection techniques, Universal and selective detectors, optimization of GC methods	Ch. 27 From Instrumental Analysis
Weeks 5, 6	Liquid Chromatographic Methods Principles of LC separations, components of LC instrument, normal phase and reversed phase separations, isocratic and gradient elution, injectors, conventional detectors, ion-exchange chromatography, size exclusion chromatography, affinity chromatography	Ch. 28 From Instrumental Analysis
Weeks 7, 8	Atomic Spectroscopic Methods Principles of atomic spectroscopic methods, atomization processes, instrumentation, background correction, Inductively coupled plasma- Atomic emission and MS	Ch. 9&10 From Instrumental Analysis

Mapping of Course Outcomes to Program Student Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Perform validation of various analytical methods for industrial applications. [1a, 1e]	15%	
Perform sample preparation methods for organic analytes and elements. [1a, 1e]	15%	
Apply GC methods for volatile organic analytes. (b,e,k, 20%) Apply LC methods for non-volatile organic analytes. (b, e, k 20%) Apply atomic spectroscopic methods for elemental analysis (b, e, k, 20%) [1b, 1e, 1k]	60%	
Selection of proper analytical method and perform simple modifications [1b, 1k]	10%	

Relationship to Program Student Outcomes (Out of 100%)										
a	b	c	d	e	f	g	h	i	j	k
15	25			35						25

Evaluation	
Assessment Tool	Weight
First	30%
Second	30%
Final	40%

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