



Jordan University of Science and Technology
Faculty of Pharmacy
Pharmacy Department

PHAR701 Instrumental Analysis

First Semester 2024-2025

Course Catalog

2 Credit Hours. This course covers the advanced spectrophotometric methods of analysis including UV-Visible, IR, MS, NMR in addition to phosphorescence spectrometry, flame emission and atomic absorption spectroscopy. Chromatographic methods are also discussed with special emphasis on the coupled techniques of GC/MS and LC/MS.

Teaching Method: On Campus

Text Book

Title	Principles in Instrumental Analysis
Author(s)	Douglas Skoog, James Holler, Stanley Grouch
Edition	7th Edition
Short Name	Ref #1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Ref #2	Pharmaceutical Analysis	David Watson	5th Edition	
Ref #3	Quantitative Chemical Analysis	Daniel C. Harris	9th Edition	
Ref #4	Analytical Chemistry	Gray D. Christian	7th Edition	
Ref #5	Interpreting organic spectra	David Whittaker	1st Edition	
Ref #6	Introduction to spectroscopy	Pavia	5th Edition	

Instructor

Name	Prof. Adnan Massadeh
Office Location	P1 L1
Office Hours	
Email	massadeh@just.edu.jo

Class Schedule & Room

Section 1:
Lecture Time: Mon : 09:30 - 11:30
Room: قاعة الندوات/صيدلة

Tentative List of Topics Covered

Weeks	Topic	References
Week 1	Basic concepts related to Instrumental analysis methods & Quality Control of pharmaceutical preparations.	From Ref #1
Week 2	Basic concepts related to Instrumental analysis methods & Quality Control of pharmaceutical preparations.	From Ref #1
Week 3	Analysis of chemical and pharmaceutical using ultraviolet (UV) and its applications.	From Ref #2, From Ref #4
Week 4	Analysis of chemical and pharmaceutical using ultraviolet (UV) and its applications.	From Ref #2, From Ref #4
Week 5	Spectroscopic techniques such as Infrared (IR), Nuclear Magnetic Resonance (NMR), Massa Spectrometry (MS) and their Applications and uses in the identification of chemical structures	From Ref #5
Week 6	Spectroscopic techniques such as Infrared (IR), Nuclear Magnetic Resonance (NMR), Massa Spectrometry (MS) and their Applications and uses in the identification of chemical structures	From Ref #5

Week 7	Spectroscopic techniques such as Infrared (IR), Nuclear Magnetic Resonance (NMR), Mass Spectrometry (MS) and their Applications and uses in the identification of chemical structures	From Ref #5
Week 8	Other instrumental methods: Fluorescence, Phosphorescence, Atomic Absorption methods and their applications.	From Ref #1
Week 9	Other instrumental methods: Fluorescence, Phosphorescence, Atomic Absorption methods and their applications.	From Ref #1
Week 10	Other instrumental methods: Fluorescence, Phosphorescence, Atomic Absorption methods and their applications.	From Ref #1, From Ref #6
Week 11	Chromatography: Theory, Mechanisms and Techniques	From Ref #1
Week 12	Chromatography: Theory, Mechanisms and Techniques	From Ref #1, From Ref #2
Week 13	Liquid Chromatography and its applications in qualitative and quantitation of chemical and pharmaceutical drugs	From Ref #1, From Ref #2
Week 14	Liquid Chromatography and its applications in qualitative and quantitation of chemical and pharmaceutical drugs	From Ref #1, From Ref #2
Week 15	Gas Chromatography and its applications	From Ref #1
Week 16	Gas Chromatography and its applications	From Ref #1

Mapping of Course Outcomes to Program Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Utilize principles of UV and its application [1PLO-MP1]	15%	
Utilize the instrumental analysis in particular, spectroscopic techniques such as IR, NMR and MS spectrometry and their applications in solving problems related to drug analysis [1PLO-MP2]	40%	
Utilize Chromatographic techniques such as HPLC, GC and their applications in drug analysis to obtain desired information [1PLO-MP1]	25%	
Create seminars related to different topics based on the choice of appropriate instrumental analytical methods for a given pharmaceutical application [1PLO-MP4]	20%	

PLO1.1	PLO2.1	PLO3.2	PLO3.3	PLO2.2	PLO2.3	PLO2.4	PLO3.1	PLO3.4	PLO3.5	PLO3.6	PLO4.1	PLO4.2	PLO4.3	PLO4.4	PLO5.1	PLO-PT1.1	PLO-PT2.1	PLO-PT2.2	PLO-PT3.1

Evaluation	
Assessment Tool	Weight
Midterm Exam Includes: Short Exam	10%
Midterm Exam Includes: Seminar by Students	20%
Midterm Exam Includes: Report by Students	20%
Final Exam	50%

Policy	
Exams	All exams are closed book and notes. The final exam is comprehensive (covers all the material). Incomplete exams need approval from the Dean of Faculty
Cheating	Prohibited; and in case of cheating the student will be subject to punishment according to the regulations.
Attendance	According to the policy: Absence more than 20% of the lectures, the student is dropped the course electronically.
Participation	Participation, answering questions will be taken in consideration.
Course withdrawal	There is a dead time for withdrawing the course through the student services. The student must follow up that dead time with the registration unit based on the academic year calendar.

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