



Jordan University of Science and Technology
Faculty of Pharmacy
Doctor Of Pharmacy (Pharm D.) Department

PHMD221 Pharmaceutical Analysis - JNQF Level: 7

First Semester 2023-2024

Course Catalog

3 Credit Hours. This course gives an overview of the analytical methodologies involved in pharmaceutical, clinical and biological applications. The student will be introduced to the concepts of qualitative and quantitative analysis including chemical calculations and volumetric analysis, in addition to the control of the quality of analytical methods in pharmaceutical and clinical laboratories such as accuracy, precision, calibration standards, analytical errors, and method selection. The theory, operation, and application of the most common analytical techniques used in pharmaceutical assays, clinical tests, and bio-assays will be discussed including spectroscopic methods, mass spectrometry, chromatographic separation, and immunoassays. Prerequisite: PHAR124

Text Book

Title	Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists
Author(s)	David G. Watson
Edition	5th Edition
Short Name	Textbook1
Other Information	

Course References

Short name	Book name	Author(s)	Edition	Other Information
Textbook2	Analytical Chemistry	Gary Christian	8th Edition	
Ref#3	ELISA	Mandy Alhaji; Muhammad Zubair; Aisha Farhana	1st Edition	https://www.ncbi.nlm.nih.gov/books/NBK555922/
Ref#4	Electrophoresis	Bulbul Chakavarti and Deb Chakavarti	1st Edition	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2583038/

Instructor

Name	Dr. Kawthar AlZarieni
Office Location	Ph4
Office Hours	Sun : 08:30 - 10:30 Mon : 09:00 - 10:00 Mon : 11:15 - 12:15 Tue : 08:30 - 10:30 Wed : 09:00 - 10:00
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Class Schedule & Room

Section 1:
Lecture Time: Sun, Tue : 12:30 - 13:30
Room: M1302

Section 2:
Lecture Time: Sun, Tue : 13:30 - 14:30
Room: P1101

Section 3:
Lecture Time: Mon, Wed : 10:00 - 11:00
Room: M3305

Prerequisites		
Line Number	Course Name	Prerequisite Type
301240	PHAR124 Pharmaceutical Organic Chemistry	Prerequisite / Study

Tentative List of Topics Covered		
Weeks	Topic	References
Week 1	Introduction to Analytical Sciences, Quantitative and Qualitative Analyses, The Analytical Process	From Textbook2
Week 2	Stoichiometry: Concentration of solutions, Molarity, Normality, Formality, Molality. Volumetric analysis	From Textbook2
Week 3	Ultraviolet (UV) & Visible Spectrophotometric Methods, Beer-Lambert's Law	From Textbook1
Week 4	Analytical Performance Characteristics	From Textbook2
Weeks 5, 6	Titrimetric and Chemical Analysis Methods	From Textbook1 , From Textbook2
Weeks 7, 8	Infrared Spectroscopy	From Textbook1
Weeks 8, 9	Nuclear Magnetic Resonance Spectroscopy	From Textbook1
Weeks 10, 11	Mass Spectrometry (MS): Introduction, ion generation and spectral interpretation	From Textbook1
Week 12	Chromatography: Liquid Chromatography	From Textbook1
Week 13	Immunoassays: ELISA	
Week 14	Electrophoresis for protein separation	

Mapping of Course Outcomes to Program Outcomes and NQF Outcomes	Course Outcome Weight (Out of 100%)	Assessment method
Utilize basic principles of conventional analysis, UV, IR, HPLC, NMR, MS analyses and data interpretation in solving subject-related problems [1PLO1.1][1L7K1, 1L7S1]	35%	First, Second, Final, Active learning
Categorize analyses related to the pharmaceutical field as qualitative or quantitative [1PLO1.1][1L7K1]	10%	First, Second, Final
Apply mathematical skills in expressing solutions and solving problems related to quantity of chemical compounds [1PLO1.1][1L7K1, 1L7S1]	20%	First, Second
Create statistics-based evaluation of given analytical results [1PLO1.1][1L7K1, 1L7S1]	5%	First
Identify the most appropriate analytical technique(s), among the ones discussed throughout the course, to be used for specific cases [1PLO3.1][1L7K1, 1L7S1, 1L7C2]	10%	Second, Final
Utilize UV and HPLC obtained results for quantitative analyses [1PLO1.1][1L7K1, 1L7S1]	15%	First, Final
Predict the order of compound elution from a specific HPLC column type based on compound molecular structures [1PLO1.1][1L7K1, 1L7S2]	5%	Final

Relationship to Program Student Outcomes (Out of 100%)															
PLO1.1	PLO2.1	PLO2.2	PLO2.3	PLO2.4	PLO3.1	PLO3.2	PLO3.3	PLO3.4	PLO3.5	PLO3.6	PLO4.1	PLO4.2	PLO4.3	PLO4.4	PLO5.1
90					10										

Relationship to NQF Outcomes (Out of 100%)			
L7K1	L7S1	L7S2	L7C2
53.33	40.83	2.5	3.33

Evaluation	
Assessment Tool	Weight
First	30%
Second	25%
Final	40%
Active learning	5%

Policy	
Exams	All exams are closed book and notes. The final exam is comprehensive, covering all course material. Requests for incomplete exams require approval from the dean of faculty.
Cheating	Cheating is strictly prohibited, and any student found engaging in cheating will be subject to disciplinary action in accordance with university regulations.
Attendance	Per the policy, if a student exceeds an absence rate of 20% from lectures, the system will automatically drop the course.
Participation	In-class participation is required
Withdrawal	There is a designated withdrawal deadline through student services. Students must adhere to this deadline as indicated in the academic year calendar and subsequently inform the registration unit accordingly.

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