



كلية الصيدلة جامعة الزيتونة الأردنية
Faculty of Pharmacy
Al-Zaytoonah University of Jordan

" نحو تعليم صيدلاني متميز "
Toward Excellence in Pharmaceutical
Education

جامعة الزيتونة الأردنية
Al-Zaytoonah University of Jordan
كلية الصيدلة
Faculty of Pharmacy



"Tradition and Quality"

Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-3.0E
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Faculty	Pharmacy	Department	Pharmacy
Course number	201213	Course title	Pharmaceutical analytical Chemistry
Number of credit hours	3hrs	Pre-requisite/co- requisite	Physical pharmacy

This course aim to cover different titrimetric procedures that are employed in quantitative pharmaceutical analysis

Course goals and learning outcomes	
Goal 1	The student is expected to have a basic knowledge regarding the importance of analysis in pharmaceutical industry.
Learning outcomes	1.1 To know the different of analytical principle and procedures that are used in pharmaceutical industry 1.2 To select the appropriate methods for isolation, purification, determination and calibration of active substances from their different sources. 1.3 To use the terms, abbreviations and appropriate symbols in practicing the pharmaceutical science and modern information technology different fields and scientific research.
Goal 2	The student is expected to have the basics of analytical calculations, the statistical and data handling
Learning outcomes	2.1 To Learn the basic calculations involved in predicting the amount of reagent needed for a reaction and the amount of product that can be obtained from reaction. 2.2 To know the basic knowledge concerning preparation, properties, reactions, and stoichiometric calculations involving solutions. 2.3 To realize the concept of statistical analysis and data handling.
Goal 3	The student is expected to know the concept of volumetric and gravimetric analytical methods and how to employ them in real life problems
Learning outcomes	3.1 To recognize the meaning of solutes, solvents and solutions 3.2 To have the skills in solving problem, critical thinking and analytical reasoning as applied to scientific problems 3.3 To master the basic techniques used in volumetric and gravimetric analysis.

Textbook	1- Fundamentals of Analytical Chemistry (Brooks/Cole – Thomson Learning), 9th edition. Author: Donald West, F. James Holler, Douglas A. Skoog & Stanley R. Crouch, 2014.
Supplementary references	1- Quantitative Chemical Analysis, 7 th edition (2007), (W. H. Freeman and Company). Author: Daniel C. Harris 2- Analytical Chemistry: An Introduction, 7 th edition (2000), (Saunders Golden Sunburst series). Author: Douglas A. Skoog, Donald M. West, F. James Holler



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<p>and Stanely R. Crouch. 3 -Modern Analytical Chemistry, first edition. David Harvey, 2000. McGraw –Hill Higher Education. 4- A textbook of Pharmaceutical Analysis, third edition. Connors, K.A.1982. John Wiley & Sons, New York.</p>
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Course Outline				
Week	Hours	Subjects	Chapters in Textbook	Notes
1	3	- Introduction - Importance of chemical analysis in pharmacy - Classification of analysis (Quantitative &Qualitative) and the typical quantitative method. -Calculations used in analytical chemistry (Dealing with units, prefixes, moles, density, volume and molarity.	Ch 1 and Ch 4	
2	3	-Concentration units (normality, molality, w/w %, w/v%, v/v%) - Concentration units(ppm ,ppb) and conversion between units - Stoichiometric calculations	Ch 4	
3	3	-Statistical Handling of Data (mean, median, range, accuracy, precision) - Statistical Handling of Data (Relative and absolute error, standard deviation, coefficient of variation, examples) -Volumetric analysis (Requirements, Terms and Definitions)	Ch 5 and Ch 6	
4	3	- Volumetric analysis (Titration, primary standard, standard solution, standardization). - Volumetric analysis (Titration curves, equivalence point, end point, titration error, type of reactions, indicators and methodologies.)	Ch 13	
5	3	-Neutralization titrations ; Acids and Bases definitions and types. - pH Calculation, Ka, Kb, Kw relationship. - Neutralization titrations: Titration curves for strong acids and strong bases.	Ch 9 and Ch 14	
6	3	- Titration curves for strong acids and strong bases, problems, indicators and applications - Buffer solution: definition, buffer capacity, Henderson – Hasselbalch equation. Strong-Weak Neutralization Titration curves - Problems, indicators and applications	Ch 9 and Ch 14	
First Exam				
7	3	- Problems, indicators and applications Non-aqueous	Ch 9 and Ch 14	



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		acid and base titration: requirements, properties of solvents. -Types of solvents, titrants, indicators and Applications. -Precipitation Reaction, Solubility and Ksp		
8	3	- Precipitation titrations; requirements and argentimetric titration curves. - Problems - Volhard's method, Fajan's method and Mohr's method.	Ch 13	
9	3	-Complexometric titrations:The concept of complexation reaction and stability constant. -Ligands definition and characterization, examples	Ch 13	
10	3	- EDTA as a ligand. - Titration curves; problems.	Ch 17	
11	3	-Titration curves; problems and indicators. - Titration methodologies, Masking agents and selectivity of EDTA	Ch 17	
Second Exam				
12	3	- Oxidation Reduction titrations (Oxidation- reduction half cell reactions, calculating oxidation number, balancing redox reactions) -Electrochemical cells: Galvanic, electrolytic, reversible and irreversible cells, schematic representation of cells..	Ch 18	
13	3	-Standard Electrode potential and cell potential - Nernst equation. - Applications: pH-determination, concentration cells and determination of equilibrium constant	Ch 18and 20	
14	3	-Some common reducing agents. - Some common oxidizing agents. - Oxidation reduction titration problems	Ch 18 and Ch 20	
15	3	- Gravimetric Analysis (Properties of precipitates and precipitating agents).Gravimetric Analysis (Application of gravimetric methods).	Ch 12	
16	-	Final Exam		

Theoretical course evaluation methods and weight	First exam 25% Second exam 25% Final exam 50%	Practical (clinical) course evaluation methods	-
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Approved by head of department		Date of approval	
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