Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-3.0E

Faculty	Pharmacy	Department	Pharmacy
Course number	201214	Course title	Pharmaceutical analytical Chemistry lab
Number of credit hours	1hr	Pre-requisite/co-requisite	Pharmaceutical analytical Chemistry + Pharmaceutical organic Chemistry lab

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 achieve the basic skills in classical pharmaceutical analysis.
Learning outcomes	1. Principles of different analytical principle & instrumental analysis techniques & procedures that are used in pharmaceutical industry, in addition to different analysis techniques. 2. Selection of appropriate methods for isolation, purification, determination and calibration of active substances from their different sources. 3. Using of laboratory tools and equipments in a professional way. 4. Working in chemical analysis, biological, toxin and inefficient and safe applicable research and services. 5. Elicitation the therapeutic pharmaceutical and analytical plans, calculating doses and implementation in patient care. 6. Evaluating and interpreting prescriptions and the results of laboratory and clinical tests.
Goal 2	To allow the students to practice accurate and precise measurements in pharmaceutical analysis.
Learning outcomes	1. Using of laboratory tools and equipments in a professional way. 2. Working in chemical analysis, biological, toxin and inefficient and safe applicable research and services. 3. Elicitation the therapeutic pharmaceutical and analytical plans, calculating doses and implementation in patient care. 4. Evaluating and interpreting prescriptions and the results of laboratory and clinical tests.
Goal 3	To allow the students to practice different volumetric and gravimetric analytical techniques and to employ them in real life problems.
Learning outcomes	1. Selection of appropriate methods for isolation, purification, determination and calibration of active substances from their different sources. 2. Using of laboratory tools and equipments in a professional way.

	3. Working in chemical analysis, biological, toxin and inefficient and safe applicable research and services. 4. Elicitation the therapeutic pharmaceutical and analytical plans, calculating doses and implementation in patient care. 5. Evaluating and interpreting prescriptions and the results of laboratory and clinical tests. 6. Working with systematic and organized time table (time management). 7. Communicating in English as well as Arabic language.
Textbook	Practical Pharmaceutical Analytical Chemistry European Pharmacopeia, 7th edition
Supplementary references	1- Fundamentals of Analytical Chemistry (Brooks/Cole – Thomson Learning), 9th edition. Author: Donald West, F. James Holler, Douglas A. Skoog & Stanley R. Crouch, 2014. 2- Quantitative Chemical Analysis,7th edition (2007), (W. H. Freeman and Company). Author: Daniel C. Harris 3- Analytical Chemistry: An Introduction, 7th edition (2000), (Saunders Golden Sunburst series). Author: Douglas A. Skoog, Donald M. West, F. James Holler and Stanely R. Crouch.

Course Outline				
Week	**Hours**	**Subjects**	**Chapters in Textbook**	**Notes**
1	**3**	Preparation of solutions: Handling of balances and volumetric glassware (preparation of 0.1 M NaCl and 0.1 M HCl	-	
2	**3**	Standardization of 0.1N HCl Determination of carbonate and bicarbonate in a mixture.	Neutralization methods, Exp.1,2	
3	**3**	Determination of purity of zinc oxide powder	Neutralization methods,Exp.3	
4	**3**	Determination of aspirin purity.	-	
5	**3**	Non aqueous titrations: - Standardization of 0.1M perchloric acid - Determination of metronidazole by non aqueous titration.	Non aqueous titration, Exp. 1,2	
6	**3**	Precipitation Titrations: - Determination of sodium chloride (Mohr's method) - Determination of bromide (Volhard's method) - Determination of a mixture of chloride and iodide (Fajan's method).	Precipitation titration, Exp. 1,2,3	
7	**3**	Complexometric titrations with EDTA:	Complexometric	

		- Determination of magnesium sulfate(unknown final) - Determination of calcium chloride - Determination of calcium and magnesium in a mixture	titrations, Exp.1,2,3	
8	**3**	Redox titrations: - Standardization of potassium permanganate - Standardization of 0.1M iodine - Determination of mixture of iodine and potassium iodide	Redox titrations, Exp.1,4,5	
9	**3**	Gravimetric analysis: - Determination of calcium as calcium oxalate monohydrate	Gravimetric analysis	
15	-	Final exams		

Theoretical course evaluation methods and weight		**Practical (clinical) course evaluation methods**	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%

Approved by head of department		**Date of approval**	

Extra information (to be updated every semester by corresponding faculty member)

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Office hours			