



Course Detailed Description – Procedures of the Course Plan Committee /Faculty of Pharmacy

QF02/0408–2.1

Department	Pharmacy
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Course Name	Instrumental Analysis Lab	Course No.	0201218
Prerequisite	Pharmaceutical Analytical Chemistry	Credit Hours	1
Number & date of course plan approval	2016-2017	Brief Description	See form QF02/0409

Course Objectives	This course aim to cover different instrumental techniques used in pharmaceutical analysis		
Intended Learning Outcomes	<ol style="list-style-type: none"> At the end of this course the student is expected to have acquired basic knowledge and skills that are essential for performing a piece of analytical work in the appropriate settings e.g. pharmaceutical industry. The aims of this course include the ability of the student to employ the knowledge and skills he would acquire to design, develop and criticize analytical methods that are based on the principles taught in accompanying theoretical course. Methods of analysis covered including electrochemical (potentiometry and conductimetry), spectroscopic (UV/ Vis., fluorometry, atomic spectroscopy, IR and NMR) and chromatographic methods (HPLC and GC). 		
Course Topics	<ol style="list-style-type: none"> Electrochemistry <ol style="list-style-type: none"> Potentiometry Conductometry Polarimetry Refractometry Spectroscopic techniques <ol style="list-style-type: none"> UV-vis spectroscopy Molecular emission: Fluorescence Atomic spectroscopy: Flame photometry Infrared spectroscopy ¹H-NMR Chromatography <ol style="list-style-type: none"> HPLC Gas Chromatography 		
Text Books	<ol style="list-style-type: none"> European Pharmacopeia, 7th edition Accompanying laboratory manual. 		
References	<ol style="list-style-type: none"> Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists, 3rd edition, David Watson, Elsevier/ Churchill Livingstone, 2012. Spectroscopic Methods in Organic Chemistry, 6th edition, Dudley Williams, Ian Fleming, McGraw-Hill book company, 1995 Organic Structures from Spectra, 3rd edition, L. D. Field, S. Sternhell and J. R. Kalman, John Wiley & Sons, 2002. Spectrometric Identification of Organic Compounds, 7th edition, Robert M. Silverstein, Francis X. Webster and David Kiemle, John Wiley & Sons, 2005. Principles of Instrumental Analysis, 6th edition, Skoog, D. A., Brooks/ Cole Thomson Learning, 2007. 		
Grade Determination	Quizzes= 20% Reports = 20% Evaluation = 10%	Practical Course Grade Determination	Course Work = 50% (Reports, Term Papers, Quizes) Final Exam = 50%



Course Outline				
Week	Hours	Subjects	Chapters in Textbook	Notes
1	3	Check in Introduction to laboratory and safety rules.	-	
2	3	-pH meter calibration -Assay of acetyl salicylic acid using potentiometric titration	Electrochemistry	
3	3	Conductimetric titration for the determination of a mixture of a strong acid and a weak acid.	Electrochemistry	
4	3	- Determination of unknown concentration of glucose using polarimetry -Determination of unknown concentration of glycerin using a refractometer	Polarimetry and Refractometry	
5	3	Determination of the purity of paracetamol raw material -Assay of paracetamol tablet. Effect of pH on phenol red spectrum (isosbestic point). - Effect of solvents on the absorption of phenol red.	Ultraviolet Spectroscopy	
6	3	Determination of benzene and toluene mixture using U.V. spectroscopy	Ultraviolet Spectroscopy	
7	3	-Determination of the purity of quinine sulfate using fluorescence spectroscopy. -determination of potassium iodine using fluorescence quenching of quinine sulfate	Spectrofluorometry	
8	3	Assay of sodium and potassium ions in an IV infusion using flame photometry.	Flame Emission and Atomic Absorption	
9	3	Work shop with worked examples on the interpretation of IR spectra. Workshop with worked examples on the interpretation of ¹ H NMR spectra Workshop with worked examples on the interpretation of ¹³ C NMR spectroscopy	Infra Red Spectroscopy (IR)	
10	3	- Demonstrating HPLC and GC. - Determination of paracetamol in suspension using HPLC based on B.P. monograph.	Chromatographic Techniques	
12	3	Check out	-	
13	-	Final exam		



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Approved by Dept. Chair		Date of Approval	
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Extra Information: (Updated every semester and filled by course instructor)

Course Instructor	
Office No.	
Extension Email	
Office hours	