

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	Technical instruments
Course number	PHCH2308
Faculty	
Department	
Course type	Major Needs
Course level	2
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

- 1 - Demonstrate knowledge of sampling methods for all states of matter
- 2 - Assess sources of error in chemical and instrumental analysis and account for errors in data analysis
- 3 - Recognize interferences in chemical and instrumental analysis
- 4 - Comprehend the concept of and perform instrument and method calibration
- 5 - Understand and be able to apply the theory and operational principles of analytical instruments
- 6 - Distinguish between qualitative and quantitative measurements and be able to effectively compare and critically select methods for elemental and molecular analyses
- 7 - To gain a working knowledge of many of the instrumental analysis methods used in a modern chemistry lab

Intended Learning Outcomes

Knowledge and Understanding	*	Define components and operation of modern chemical instrumentation
	*	Interpret results acquired from various chemical instrumentation
	*	Assess the benefits and limitations of different instrumentation methods and instrumental components
Professional Skills	*	Identify appropriate instrumental methods for a chemical analysis
	*	Able to use various instruments effectively in the analysis of chemical compounds especially drugs

## Course Contents

- 1 - First part: Spectroscopy
- 2 - Refractometry
- 3 - Polarimetry
- 4 - Introduction to Atomic Spectroscopy methods of analysis (Atomic Emission spectroscopy, Atomic absorption Spectroscopy)
- 5 - Introduction to molecular spectroscopy
- 6 - UV/VIS absorption spectroscopy-
- 7 - Fluorescence spectroscopy
- 8 - IR absorption spectroscopy
- 9 - Nuclear magnetic resonance
- 10 - Mass Spectrometry
- 11 - Second part: Analytical Separations
- 12 - Introduction to Chromatography
- 13 - Thin layer chromatography (TLC), Paper chromatography (PC), Column chromatography (CC)
- 14 - High performance liquid chromatography (HPLC)
- 15 - Gas Chromatography
- 16 - Capillary Electrophoresis (CE)

## Teaching and Learning Methods

- 1 - Lectures and discussion
- 2 - Tutorials
- 3 - Physical models
- 4 - Learning Videos
- 5 - Study cases

## Teaching and Learning Methods for the Disabled Students

- 1 - None

## Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
In-Class Quizzes	Unannounced random in-class quizzes based upon previously lectures	10
First exam	Fifth week	20
Second Exam	tenth week	20
Final Exam	sixteenth week	50

## Books and References

Course note	Lecture Notes
Essential books	David G. Watson, Pharmaceutical Analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists, 4th edition (2016)
Recommended books	Skoog, D.A., Holler, F.J., Crouch, S.R. Principles of Instrumental Analysis, 6th edition Robinson, F., " Undergraduate Instrumental Methods of Analysis", 6th edition, 2005 James M. Miller, Chromatography: Concepts and Contrasts, 2nd ed, 2009

