

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	<ul style="list-style-type: none"> * 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	<ul style="list-style-type: none"> * 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

