Hashemite University
Faculty of Pharmaceutical Sciences
Department of Pharmaceutical Chemistry

Semester: Second **Year: 2019- 2020**

Course Information	
Course Title	**Advanced of Pharmaceuticals Analysis**
Course Number	**1717031590**
Credit Hours	**3**
Prerequisites	**110103211 and 131703315**

Instructor	
Name	**Dr. Nabil AL-Hashimi**
Office	**1039**
Office Phone	**(05) 3903333 Ext: 3425**
Office Hours	**TBD**
E-mail	**Nabil@hu.edu.jo**

Course Description

This course is designed to develop an understanding of spectroscopy and its application in the elucidation of the structures of chemical compounds. This will include aspects of C H N S O elemental analysis, UV-visible spectroscopy, infrared spectroscopy, nuclear magnetic resonance (NMR) spectroscopy and mass spectrometry. The fundamental physical and chemical principles of each method will be discussed. The major emphasis of this course is on chemical structure determination by way of interpreting the data (generally in the form of a spectrum or spectra) that each method provides.

Course Objectives

The students are expected:
1. To provide a background in Instrumental principles that are important in analytical chemistry, pharmacy, agriculture and other branches of Science.
2. To know the importance of application of instrumental methods in pharmaceutical analysis.
3. To study the UV, Visible and to solve problems using Beer's-Lambert's law.
4. To know the importance of instrumental analysis in the identification of the chemical structures using IR, NMR and MS.

Intended Learning Outcomes

A. Knowledge Transfer:Upon completion of the course, the student should be able to:

A-1 Demonstrate and understanding the basic principles spectroscopic and electrochemical analytical methods.
A-2 Explain different spectroscopic and electrochemical methods and the need for their use in pharmaceutical analysis
A-3 Give knowledge about applications of spectroscopic and electrochemical methods for pharmaceutical analysis.

B. Intellectual Skills: When students have completed the programme they will be able to:

B-1 Choose appropriate spectroscopic methods for the analysis of a material of pharmaceutical relevance.
B-2 Evaluate the validity of the electrochemical and spectrometric methods in the analysis of target

compound in complex matrices.
B-3 Interpret spectra, identification and quantitation of pharmaceutical compounds.
B-4 Use spectrophotometer, spectrofluorometric and flame photometer in the identification and quantitation of pharmaceutical compounds.

C. Approach to Practice: When students have completed the programme they will be able to:

C-1 Students will be encouraged to read widely and to research the various topics using the assigned texts, libraries and relevant web sites
C-2 The use of other information resources is essential if students are to gain maximum benefit from their studies.
C-3 This approach to the subject is in part designed to encourage students to be more responsible for their own learning and to become life long learners

D. Personal and Professional Development: When students have completed the programme they will be able to:

D-1 Develop of problem solving and critical thinking skills.
D-2 Use of videos and animation to effectively understand the concepts.
D-3 The ability to use simple word and IT skills (i.e., data processing, software, internet, and multimedia) and the library to find information.
D-4 The ability to be self-motivated learners and responsive to feedback.
D-5 Working in team (i.e., sharing presentations and discussions and solving problem).

Reading List	
1. Essential Book:	**Organic Structures from spectra, 4 th Ed., L.D. Field, S. Sternhell, J.R. Kalman, John Willy and Sons, LTD (2008).**
2. Recommended Books:	**1. Principles of instrumental analysis, 6th Ed., D.A. Skoog, F.J. holler & S.R. Crouch, Thomson Brooks/Cole (2007).** **2. Pharmaceutical analysis: A Textbook for Pharmacy Students and Pharmaceutical Chemists, 2th Ed., D.G. Watson, Churchill Livingstone (2012).** **3. Undergraduate Instrumental analysis, 7th Ed., J.W. Robinson, E.S. Frame, G.M. Frame, CRC Press Taylor& Francis Group, (2014).** **4. Chemical analysis: modern instrumentation methods and techniques, 2th Ed. , F. Rouessac and A. Rouessac, John Whiley (2007).** **5. Medical Waste Management, International Committee of the Red Cross, (2011).**

Week	Credit Hours	ILOs	Topics	Teaching Procedure	Assessment methods
1	**3**	**A B C D**	**Spectrometric Methods and Components of Optical Instruments**	**Lecturing**	**A, MTA, F**
2	**3**	**A B C D**	**Spectroscopic Elemental Analysis**	**Lecturing**	**A, MTA, F**
3-4	**6**	**A B C D**	**Ultraviolet/Visible Molecular Absorption Spectrometry**	**Lecturing**	**A, MTA, F**
5-6	**3**	**A B C D**	**Infrared Spectrometry**	**Lecturing**	**A, MTA, F**
7-10	**6**	**A B C D**	**Nuclear Magnetic Resonance Spectroscopy** **-^{1}H-NMR**	**Lecturing**	**A, MTA, F**

			-^{13}C-NMR		
11-12	**3**	**A B C D**	**Molecular Mass Spectrometry**	**Lecturing**	**A, MTA, F**
13	**6**	**A B C D**	**Case of Study**	**Lecturing**	**A, MTA, F**

Assessment	Grade	Date
First exam	25%	The 5th week
Second exam	25%	The 10th week
Final Exam	50%	The 14th week

Important regulations

- On average, students need to spend 3 hrs of study and preparation weekly.
- Excellent attendence is expected. According to the university policy, students who miss more than 15% of the lecture hours with or without excuse will be dismissed from the course
- At the beginning of the lectures, be on time and don't leave before the end of the lecture without an accepted excuse
- If you missed a class, it is your responsibility to find out about any announcements or assignments you have missed
- For any clarification, please communicate your instructor at his posted office hours or by appointment
- Switch off your mobile or keep it silent throughout the lecture
- Listen well to the lecture and avoid side discussions, if you have a question, ask your instructor and not your collegue
- If you have any information, document your reference, if you didn't, then you broke the intellectual property rights law and the law will be applied
  - For more informations, visit the website:
  - http://www.plagiarism.org/
- Exams are scheduled to be given three times throughout the semester, your are expected to attend all. If not, make-up exams will be offered for valid reasons. It may be different from regular exams in content and format.
- Cheating, academic diconduct, fabrication and plagiarism will not be tolerated, and the university policy will be applied

Last updated on 28 / 1 /2020 by : Dr. Nabil AL-Hashimi