



**Jerash University**  
**Faculty of Pharmacy**  
**2017/2018**

## **Course Syllabus**

<b>Title</b>	pharmaceutical Analytical Chemistry 1	<b>Code</b>	1101113
<b>Level</b>	2 <sup>nd</sup>	<b>Prerequisite</b>	general chemistry (1)
<b>Time</b>	Mon.wed. 9:30-11	<b>Credit hours</b>	3 hours

### **Academic Staff Specifics**

<b>Name</b>	<b>Rank</b>	<b>Office</b>	<b>Office Hours</b>	<b>E-mail</b>
Dr.Deemah AlZughoul	lucturer	410	Sun.tue. 10-12 Mon.wed.11:30-1:30	TBA

### **Module description:**

Students will have the knowledge of the Principles of qualitative and quantitative analysis, methods expressing of the concentrations, principles of volumetric analysis, acid-base Equilibrium in aqueous and in nonaqueous solutions, and acid-base titration and their applications in both solutions. Detailed examples with calculations are given for each topic.

### **Module objectives:**

The aim of this course is to provide the student with basic knowledge and understanding of the different analytical method and principles of qualitative and quantitative analysis. It gives the students the skills of calculation the concentration unites, the analyte in titration, acid-base equilibrium, and buffers.

### **Teaching methods:**

Lectures, discussion, problem solving.

## Learning outcomes:

At the end of this module, student will be able to:

1. Defined the principles of analytical chemistry.
2. Using different ways to evaluate the data.
3. Practice the stoichiometric parameters calculations.
4. Carry out volumetric analysis calculations.
5. Understand acid-base equilibrium and solve the related problems.

## Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 40 marks

## Allocation of Marks

Assessment Instruments	Mark
First examination	20%
Second examination	20%
Final examination	40%
Reports, research projects, Quizzes, Home works, Projects	20%
Total	100%

## Course/module academic calendar

Week	Basic and support material to be covered
(1)	Course introduction; qualitative and quantitative analysis. Role of analytical chemistry in pharmacy and medicine
(2)	Stoichiometric analysis (molarity, normality) (part 1)
(3)	Stoichiometric analysis (weight percent, ppm) (part2)
(4)	Principle of volumetric analysis
(5)	Application of titration calculations.
(6)	Acid-base Equilibria in aqueous solution and pX concept (x; H <sup>+</sup> , OH <sup>-</sup> ).
(7)	pH calculations

(8)	Buffer solutions and physiological buffers.
(9)	Neutralization reactions; acid-base titrations, titration curve, factors affecting and theory of indicators.
(10)	Calculations involving applications.
(11)	Titration of polyprotic acids and polyequivalent bases
(12)	Applications involving determinations of mixtures of acids and mixtures of bases.
(13)	Acid-base equilibria in nonaqueous solution
(14)	Titration curves and equivalent point determination.
(15)	Applications involving; carboxylic acids, phenols and amines determinations.
(16)	<b>Final Examination</b>

#### Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

#### Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

#### Module references:

##### Books:

1. **Analytical Chemistry** By: Gary D. Christian (editor), ISBN;0471214728 John Wiley and Sons, 2003, sixth edition
2. **Quantitative Analysis** By: R.A-Day, JR, A.L-Underwood (editors), Prentice-Hall, ISBN;0-13-747361-3. 1991, 6th edition
3. **Quantitative analytical chemistry** By: James S. Fritz, George H. Schenk (editors), Prentice – Hall, Englewood Cliffs, ISBN;0-205-10480-0. 1987, 5th edition.
4. **ANALYTICAL CHEMISTRY (principles)** By: John H. Kennedy (editor) Harcourt Brace Jovanovich, ISBN;0-15-502700-x, 1984, 1st edition.
5. **Analytical chemistry (an introduction)** By: Skoog /West /Holler (Editors), Saunders Golden SunBurst series, ISBN;0-03-022930. 1999, 7th edition

*In addition to the above, the students will be provided with handouts by the lecturer*