



**Philadelphia University**  
**Faculty of Pharmacy**  
**Department of pharmaceutical sciences**  
**Second semester, academic year 2016/2017**

<u>Course syllabus</u>	
<b>Course title:</b> Analytical Chemistry laboratory	<b>Course code:</b> 0510114
<b>Course level:</b> 1 <sup>st</sup> year	<b>Course prerequisite (s) and/or corequisite (s):</b> 0510113
<b>Lecture time:</b> Sun 8:10-10:00, Mon 11:15-1:15, Tue 8:10-10, 1:10-3:00 Wed 11:15-1:15 Thu 8:10-10:00, 1:10-3:00	<b>Credit hours:</b> 1 credits  <b>Contact hours:</b> 2 hours
<b>Location:</b> pharmacy college lab 412	

<u>Academic Staff Specifics</u>				
Name	Rank	Office number and location	Office hours	E-mail address
<b>Coordinator:</b> Dr. Ahmad A. Najjar	Assistant Professor	nursing college 203	<b>10:00-12:00</b>	a.najjar@philadelphia.edu.jo
<b>Lecturer:</b> Mohammad Abu Nuwar	Lab instructor	Pharmacy college 520		mabunuwar@philadelphia.edu.jo

### Course description

The course is designed to provide the student with basic information about practical analytical chemistry. This course introduces the equipment as well as the experimental techniques of quantitative analysis and helps the students to develop skills in their use. It is a practical picture of the theoretical course, exemplified by doing various experiments in acid-base titrations in aqueous and non-aqueous solutions, precipitation titration, reduction-oxidation titration and their applications.

### Course objectives:

This course is devoted to the exploration of principles of quantitative analysis in aqueous and non-aqueous solutions.

### Courseresources

- **Text book/ books**  
Analytical Chemistry  
by Gary D. Christian (editor) 6<sup>th</sup> edition (2003),  
ISBN;0471214728 John Wiley and sons

- **Laboratory Handbook/ books (when applicable)**

Pharmaceutical Analytical Chemistry Laboratory Manual, Philadelphia University

**Teaching methods (Lectures, discussion groups, tutorials, problem solving, debates, etc)**

Tutorial and Practical experimental work

**Learning outcomes:**

- Knowledge and understanding  
The course presents fundamental practical concepts and applications of volumetric analysis based on acid-base, precipitation, complexation and redox reaction. Identify the different types of glassware and chemicals available in the analytical lab and their uses. Distinguish between titrations in aqueous media and titrations in a non-aqueous media. Identify the different types of indicators available and the pH range at which they can be used.
- Cognitive skills (thinking and analysis).  
Critical thinking (answers to instant questions) and Problem solving dealing with titrations
- Communication skills (personal and academic).  
Report writing and oral presentation and discussion
- Transferable Skills.  
How to communicate with instructors and university staff, and how to work independently and as a part of a team. And learn laboratory safety and self protection rules.
- Psychomotor Skills (When applicable)  
Hand-eye coordination tasks such as determination titration end point.

**Assessment instruments**

- Exams
- Quizzes.
- Short reports and/ or presentations, and/ or Short research projects
- Homework assignments

<b><u>Allocation of Marks</u></b>	
<b>Assessment Instruments</b>	<b>Mark</b>
Reports and evaluation	<b>30</b>
Quizzes	<b>20</b>
Practical exam	<b>10</b>
Final examination	<b>40</b>
Total	<b>100</b>

## Documentation and academic honesty

- Documentation style (with illustrative examples)  
Whenever applicable, students should conduct their assignments themselves whether individually or in a group work referencing all information, data, figures and diagrams taken from literature. The references should be given according to the acceptable format
- **Protection by copyright**  
Students should realize that some published information or data are the property of their authors and they are not allowed to use it without asking permission from the originators.
- **Avoiding plagiarism.**  
Plagiarism is the unauthorized use or close imitation of the language and thoughts of another author and the representation of them as one's own original work, without proper acknowledgment of the author or the source. Students must pursue their studies honestly and ethically in accordance with the academic regulations. Cheating in exams and plagiarism are totally unacceptable and those who, intentionally, commit such acts would be subjected for penalties according to the University regulations.

## Course/ academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Introduction/safety rules	
(2)	laboratory equipments & practice the use of burette (titration technique)	
(3)	Calibration of burette & practice the use of analytical balance	
(4)	Neutralization titration in aqueous medium	
(5)	Determination of an acid mixture	
(6)	Back titration	
(7)	Precipitation titration (Argentometry)	
(8)	Redox titration (Permanganate titration $\text{KMnO}_4$ )	
(9)	Redox titration of Iodine	
(10)	Complexometric titration with EDTA	
(11)	Practical exam	
(12)	Lab final exam	

## Expected workload:

On average students need to spend 1 hours of study and preparation for each lab.

## 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.

## Other Education Resources

None