



Course specification  
2018- 2019  
Faculty of Pharmacy  
Mansoura University



Second Level

Course Specification Pharmaceutical  
Analytical Chemistry 1

**University:** Mansoura University (MU)  
**Faculty:** Pharmacy  
**Department:** Pharmaceutical Analytical Chemistry  
**Course title:** Pharmaceutical Analytical Chemistry 1

**Course code:** PA213

<b>Program on which the course is given</b>	B. Pharm
<b>Academic Level</b>	Second Level, First semester, 2018-2019
<b>Date of course specification approval</b>	

1. Basic Information: Course data:

<b>Course title:</b>	<b>Pharmaceutical Analytical Chemistry 1</b>	<b>Code: PA213</b>
<b>Specialization:</b>	<b>Pharmaceutical</b>	
<b>Prerequisite:</b>	<b>Registration</b>	
<b>Teaching Hours:</b>	<b>Lecture:2</b>	<b>Practical:1</b>
<b>Number of units: (credit hours)</b>	<b>3</b>	

2. Course Aims:

**2.1.** Recall the basic principles of quantitative chemical methods of analysis including; acid-base, gravimetric, precipitometric and complexometric methods of analysis.

3. Intended learning outcomes (ILO<sub>s</sub>):

**a- Knowledge and understanding**

At the end of this course the student will be able to:

<b>a1</b>	Recognize the different analytical techniques used for determination of chemical substances.
<b>a2</b>	Distinguish the standardization methods of chemical substances.

**b- Intellectual skills**

At the end of this course the student will be able to:



Course specification  
2018- 2019  
Faculty of Pharmacy  
Mansoura University



b1	Propose suitable methods of chemical analysis.
b2	Interpret experimental data based on relevant chemical and pharmaceutical principles

**c- Professional and practical skills**

At the end of this course the student will be able to:

c1	Apply proper handling and disposal of chemicals.
c2	Show ability to conduct experimental studies and apply different quantitative methods of analysis of pharmaceutical compounds.

**d- General and transferable skills**

At the end of this course the student will be able to:

d1	Interact effectively in team working.
d2	Apply calculations for chemical analysis.
d3	Acquire the ability to learn independently.
d4	Present information clearly in written, electronic and oral forms.
d5	Show the ability for critical thinking, problem-solving, decision-making, and time managing capabilities.

**4. Contents:**

Week No	Topics	No.of hours	Lecture credit hours	Practical credit hours
1.	Acid- Base titrations; introduction, theory of acids and bases,	2	2 hours	
2.	pH value and its significance, pH of different solutions, buffers,	2	2 hours	
3.	Acid- base indicators, problems, types of acid- base titrations	2	2 hours	
4.	Acid-base titration curves, applications of acid- Base titration.	2	2 hours	
5.	Non aqueous titrations.	2	2 hours	
6.	Precipitation titration; introduction, solubility product constant ( $K_{sp}$ ), factors affecting solubility of PPT, precipitation titration curve	2	2 hours	
7.	<b>Mid-term Exam</b>			
8.	Methods of precipitation titration and application.	2	2 hours	



**Course specification**  
**2018- 2019**  
**Faculty of Pharmacy**  
**Mansoura University**



9.	Holiday of the birth of the prophet Mohammed			
10.	Complexometric titration; introduction, EDTA titration, metallochromic indicators.	2	2 hours	
11.	EDTA titration curve, types of EDTA titrations, EDTA selectivity, analysis of mixtures of metal ions.	2	2 hours	
12.	Gravimetric analysis	2	2 hours	
14.	<b>Final written &amp; oral exam</b>			
	<b>Practical topics</b>			
<b>Week No</b>	<b>Topics</b>	<b>No.of hours</b>	<b>Lecture credit hours</b>	<b>Practical credit hours</b>
2.	-Handling rules. -Determination of HCl.	2		1 hour
3.	-Assay of $\text{NH}_4\text{Cl}$ (Back titration). - Assay of ( $\text{NH}_4\text{Cl}$ & HCl) mixture.	2		1 hour
4.	1-Assay of HCl/HAC mix. 2- Assay of borax.	2		1 hour
5.	1- Determination of $\text{Na}_2\text{CO}_3$ / NaOH mixture. 2- Determination of $\text{Na}_2\text{CO}_3$ / $\text{NaHCO}_3$ mixture.	2		1 hour
6.	1-Determination of NaCl (Mohr's method). 2-Determination of NaBr (Volhard's method).	2		1 hour
7.	<b>Mid-term Exam.</b>			
8.	1-Determination of NaCl (Volhard's method).	2		1 hour
9.	1-Determination of $\text{Ca}^{2+}/\text{Mg}^{2+}$ mixture. 2-Determination of potash alum $\text{Al}^{3+}$ .	2		1 hour
10.	1- Complexometric determination of $\text{Ca}^{2+}, \text{Mg}^{2+}$ .	2		1 hour
11.	Final practical exam 1st group.	2		1 hour
12.	Final practical exam 2nd group.	2		1 hour



Course specification  
2018- 2019  
Faculty of Pharmacy  
Mansoura University



## 5. Teaching and learning Methods:

5.1	Lectures using whiteboard
5.2	Lectures using Datashow, PowerPoint presentations
5.3	Laboratory with equipments, chemicals and reagents.

## 6. Student Assessment:

### a- Assessment methods

1. Written exam	To assess understanding, intellectual and professional skills
2. Practical exam	To assess professional and practical skills
3. Oral	To assess knowledge, understanding, intellectual skills, general skills and confidence
4. Quizzes.	To assess the skills of problem-solving.

### b- Assessment schedule

Assessment 1	Practical	11 <sup>th</sup> and 12 <sup>th</sup> week
Assessment 2	Mid-term	7 <sup>th</sup> week
Assessment 3	Oral	14 <sup>th</sup> week
Assessment 4	Written	4 <sup>th</sup> week

### c- Weighting of assessments

1.	Mid-term examination	10%
2.	Final-term examination	50%
3.	Oral examination	15%
4.	Practical examination and Semester work	25%
Total		100%

## 7. List of References

No	Reference	Type
1.	Practical course notes prepared by the department staff members	Course notes
2.	Lecture notes and practical course notes prepared by the department staff members.	Course notes
3.	Fundamentals of Analytical Chemistry , Douglas A.; Skoog; Donald M., West, F. James Holler, Stanley, R. Crouch Thomson, Australia 8th ed. (2004).	Book
4.	Quantitative Chemical Analysis, Daniel C. Harris, 6th ed., W.H. Freeman and Company, New York (2003).	Book



**Course specification  
2018- 2019  
Faculty of Pharmacy  
Mansoura University**



5.	Vogel,s Textbook of Quanitative chemical Analysis, J. Mendham, M.A, MSc, C. Chem, M. RSC, 6th ed., India (2004).	<b>Book</b>
6.	Pharmaceutical Analytical Chemistry, Quantitative Analysis, Amer, M.M. Faculty of Pharmacy, Cairo University.	<b>Book</b>

### 8. Matrix of knowledge and skills of the course

No	Course contents	Study Week	ILOS			
			Knowledge & understanding	Intellectual skills	Professional and practical skills	General & transferable skills
1.	Acid base titration and applications.	1 <sup>st</sup> - 4 <sup>th</sup>	a1, a2	b1, b2	c1, c2	d2 , d5
2.	Non aqueous titration and its applications.	5,6 <sup>th</sup>	a1, a2	b1, b2	c1 and c2	d1, d4
3.	Precipitation titration.	8 <sup>th</sup> and 10 <sup>th</sup>	a1	b1, b2	c1 and c2	d1, d4
4.						
5.	Complexometric titration.	11 <sup>th</sup>	a1	b1, b2	c1 , c2	d3 , d4
6.	Gravimetric analysis	12 <sup>th</sup>	a1	b1, b2	c1 and c2	d1, d4

<b>Course Coordinator:</b>	<b>Fawzia Ahmed Ibrahim</b>
<b>Head of Department:</b>	<b>Yasser ElshabrawyAbdelaal</b>