Course specification
2017- 2018
Faculty of Pharmacy
Mansoura University

Second Level | **Pharmaceutical Analytical Chemistry 1**

University: Mansoura University (MU)
Faculty: Pharmacy
Department: Pharmaceutical Analytical Chemistry
Course title: Pharmaceutical Analytical Chemistry 1
Course code: PA 213

Program on which the course is given	B. Pharm
Academic Level	Second Level, First semester, 2017-2018
Date of course specification approval	/ 12 /2017

1. Basic Information: Course data:

Course title:	**Pharmaceutical Analytical Chemistry 1**	**Code: PA 213**
Specialization:	**Pharmaceutical**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture: 2**	**Practical: 1**
Number of units: (credit hours)	**3**	

2. Course Aims:

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

3. Intended learning outcomes (ILOs):

a- Knowledge and understanding

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

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

b- Intellectual skills

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

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.	Holiday of the Hijri New Year			
2.	Acid- Base titrations; introduction, theory of acids and bases,	2	2 hours	
3.	pH value and its significance, pH of different solutions, buffers,	2	2 hours	
4.	Acid- base indicators, problems, types of acid- base titrations	2	2 hours	
5.	Acid-base titration curves, applications of acid- Base titration.	2	2 hours	
6.	Non aqueous titrations.	2	2 hours	
7.	**Mid-term Exam**			
8.	Precipitation titration; introduction, solubility product constant (Ksp), factors affecting solubility of PPT, precipitation titration curve	2	2 hours	

9.	Methods of precipitation titration and application.	2	2 hours	
10.	Complexometric titration; introduction, EDTA titration, metallochromic indicators.	2	2 hours	
11.	Holiday of the birth of the prophet Mohammed			
12.	EDTA titration curve, types of EDTA titrations, EDTA selectivity, analysis of mixtures of metal ions.	2	2 hours	
14.	**Final written & oral exam**			
	Practical topics			
Week No	**Topics**	**No. of hours**	**Lecture credit hours**	**Practical credit hours**
2.	-Handling rules. -Determination of HCl.	2		1hour
3.	-Assay of NH_4Cl (Back titration). - Assay of (NH_4Cl & HCl) mixture.	2		1hour
4.	1- Assay of HCl/HAC mix. 2- Assay of borax.	2		1 hour
5.	1- Determination of Na_2CO_3 / NaOH mixture. 2- Determination of Na_2CO_3 / $NaHCO_3$ mixture.	2		1hour
6.	1- Determination of NaCl (Mohr's method). 2- Determination of NaBr (Volhard's method).	2		1hour
7.	**Mid-term Exam**.			
8.	1- Determination of NaCl (Volhard's method).	2		1 hour
9.	1- Determination of 1-Ca^{2+}/Mg^{2+} mixture. 2- Determination of potash alum Al^{3+}.	2		1hour
10.	1- Complexometric determination of Ca^{2+}, Mg^{2+}.	2		1hour
11.	Final practical exam1st group.	2		1 hour
12	Final practical exam 2nd group.	2		1 hour

5. Teaching and learning Methods:

5.1	Lectures using whiteboard
5.2	Lectures using Data show, 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	11th and 12th week
Assessment 2	Mid-term	7th week
Assessment 3	Oral	14th week
Assessment 4	Written	14th 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, Stanely, 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

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

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.	2^{st} - 5^{th}	a1, a2	b1, b2	c1, c2	d2 , d5
2.	Non aqueous titration and its applications.	6^{th}	a1, a2	b1, b2	c1 and c2	d1, d4
3.	Precipitation titration.	8^{th} and 9^{th}	a1	b1, b2	c1 and c2	d1, d4
4.	Complexometric titration.	10^{th} -12^{th}	a1	b1, b2	c1 , c2	d3 , d4

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