Course specification
2017- 2018
Faculty of Pharmacy
Mansoura University

Second Level

Course Specification:Pharmaceutical Analytical Chemistry (2)

University: Mansoura University (MU)
Faculty: Pharmacy
Department: Pharmaceutical Analytical Chemistry
Course title: Pharmaceutical Analytical Chemistry (2)
Course code: PA224

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

1. Basic Information: Course data:

Course title:	**Pharmaceutical Analytical Chemistry (2)**	**Code: PA224**
Specialization:	**Pharmaceutical**	
Prerequisite:	**Registration**	
Teaching Hours:	**Lecture:2**	**Practical: 1**
Number of units: (credit hours)	**3**	

2. Course Aims:

2.1. Give the principle of quantitative chemical methods of analysis, including oxidation reduction titrations and spectroscopic analysis (spectrophotometry, spectrofluorimetry, atomic absorption spectroscopy, AAS)
2.2. Recognize the general aspects of statatistics
2.3. Cover the applications of these methods to pharmaceutical compounds.

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 the determination of chemical substances.
a2	Recall the principles of different analytical techniques applied for the estimation of pharmaceutical compounds

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.
b3	Distinguish the physical and chemical properties of chemicals.

c- Professional and practical skills

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

c1	Apply proper and safe handling and disposal of chemicals.
c2	Show the 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 a team work.
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
1,2	- Introduction to redox titrations, Nernest equation and factors affecting redox potential.	4	4 hours	
3,4	- Methods for detection of end point, Applications of redox reactions	4	4 hours	
5,6	- Statistics	4	4 hours	
7	**Mid-term Exam**			
8-9	UV/Vis Spectrophotometry; Introduction. - Components of spectrophotometer, Beer-Lambert law, Factors affecting absorption spectrum, applications.	4	4 hours	

10-11	- Spectrofluorimetry; Introduction, Factors affecting Fluorescence, Components of a fluorometer, applications	4	4hours	
12-13	-Atomic Spectroscopy ; Introduction, Principle of AAS, Difference between AAS & molecular spectroscopy, Atomic absorption spectrophotometer, Interferences in AAS	4	4 hours	
15	**Starting of Final written & oral**			
	Practical topics			
Week No	**Topics**	**No.of hours**	**Lecture credit hours**	**Practical credit hours**
2.	1- Determination of oxalic acid. 2- Determination of oxalic acid/acetic acid mix.	2		1 hour
3.	1-Determination of Fe^{2+}/Fe^{3+} mix. 2- Determination of H_2O_2.	2		1 hour
4.	1- Determination of lead acetate.	2		1 hour
5.	1-Determination of potassium persulfate.	2		1 hour
6.	1- Determination of iodine/iodide mixture.	2		1 hour
7.	**Mid-term Exam**			
8	1- Determination of ascorbic acid.	2		1 hour
9.	1- Colorimetry ($KMnO_4$) 2- Problems on Beer-Lambert law.	2		1 hour
10.	1- Colorimetry ($K2Cr_2O_7$.(2- Problems on Beer-Lambert law.	2		1 hour
11.	1- Colorimetry (Fe^{3+} in ampoules) 2- Quiz on Beer-Lambert law. 3- Fluorimetry (demonstration)	2		1 hour
12.	PRACTICAL EXAM 1st group	2		1 hour
13.	PRACTICAL EXAM 2nd group	2		1 hour

5. Teaching and learning Methods:

5.1	Lectures using whiteboard
5.2	Lectures using Datashow, PowerPoint presentations
5.3	Research assignments
5.4	Discussion session
5.5	Laboratory with equipments, chemicals and reagents.

6. Student Assessment:

a- Assessment methods

1. Written exam	To assess understanding, intellectual and professionalskills
2. Practical exam	To assess professional and practical skills
3. Oral	To assess knowledge, understanding, intellectual skills, general skills and confidence

b- Assessment schedule

Assessment 1	Practical	12thweek and 13th week
Assessment 2	Mid-term	7thweek
Assessment 3	Oral	15thweek
Assessment 4	Written	5thweek

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 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.	- Introduction to redox titrations, Nernest equation and factors affecting redox potential.	1st-2nd	a1,a2	b1,b2,b3	c1,c2	d1,d2,d3,d4, d5
2.	- Methods for detection of end point, Applications of redox reactions	3rd-4th	a1,a2	b1,b2,b3	c1,c2	d1,d2,d3,d4, d5
3.	Statistics	5th-6th	a2	b1,b2	c2	d1,d2,d3,d5
4.	- UV/Vis Spectrophotometry ; Introduction,Components of spectrophotometer, Beer-Lambert law, Factors affecting absorption spectrum, applications.	8th-9th	a1,a2	b1,b2,b3	c1,c2	d1,d2,d3,d4, d5
5.	-Spectrofluorimetry; Introduction, Factors affecting Fluorescence, Components of a fluorometer, applications	10th-11th	a1,a2	b1,b2,b3	c1,c2	d1,d3,d4
6.	-Atomic Spectroscopy ; Introduction, Principle of AAS, Difference between AAS & molecular spectroscopy, Atomic absorption spectrophotometer, Interferences in AAS	12th-13th	a1, a2	b1,b2,b3	c1,c2	d1,d3,d4

Course Coordinator:	**Mohamed Elsayed Metwally**
Head of Department:	**Yaser El Shabrawy**