Course specification
2017- 2018
Faculty of Pharmacy
Mansoura University

Third Level

Course Specification: Instrumental and Applied Analysis

University: Mansoura University (MU)
Faculty : Pharmacy
Department :Pharmaceutical Analytical Chemistry
Course title: Instrumental and Applied Analysis

Program on which the course is given	B. Pharm
Academic Level	Third Level, semester one
Date of course specification approval	

1- Basic Information : Course data :

Course title:	Instrumental and Applied Analysis	**Code:**	PA315
Specialization:	**Pharmaceutical**		
Prerequisite:	Registration		
Teaching Hours:	**Lecture: 2**	**Practical:**	2
Number of units: (credit hours)	**3**		

2- Course Aims:

2.1 Give the principle of instrumental and applied analytical methods, including chromatographic methods, electrochemical analysis, capillary electrophoresis and mass spectrometry.
2.2 Cover the application of these methods to pharmaceutical compounds

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	Identify the principles of various analytical techniques and instruments.

b- Intellectual skills

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

b1	Determine suitable methods of analysis and QC of drugs as raw material, in dosage forms and in biological fluids.
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	Show the ability to conduct experimental studies and apply different quantitative methods of analysis of pharmaceuticals
c2	Analyze and interpret quantitative analytical data

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.

3- Contents :-

Week No	Topics	No.of hours	Lecture	Practical
1.	Introduction of TLC	2	1	
2.	HPLC, instrumentation and applications.	2	1	
3.	GC, instrumentation and applications	2	1	
4.	Capillary electrophoresis.	2	1	
5.	Potentiometry principles and instrumentation	2	1	
6	Potentiometric titration and its pharmaceutical applications.	2	1	
7	Midterm Exam			
8	Conductometry principles and instrumentation	2	1	
9	Application of Conductometry and introduction of polarography	2	1	

10	Polarography instrumentation and applications.	2	1	
11	Mass Spectrometry.	2	1	
	Practical topics			
2	Paper chromatography	2		1
3	Thin layer chromatography	2		1
4	- Interpretation of chromatograms -HPLC demonstration.	2		1
5	- Interpretation of chromatograms - Solving problems.	2		1
6	Interpretation of chromatograms.	2		1
7	Midterm Exam			
8	Conductometric determination of HCl.	2		1
9	Conductometric determination of acetic acid.	2		1
10	Potentiometric determination of HCl.	2		1
11	Potentiometric determination of acetic acid.	2		1
12	Final Exam	2		1

4- Teaching and learning Methods :

5.1	Lectures using white board and data show.
5.2	Practical session using laboratory equipment
5.3	Research assignments

5- Student Assessment:

a- Assessment methods:

1-Written exam	To assess understanding, intellectual, professional
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 Knowledge, understanding and intellectual skills

b- Assessment schedule

Assessment 1	Practical	12th week
Assessment 2	Quiz	5th week
Assessment 3	Mid-term	7th week
Assessment 4	Oral	14th week
Assessment 5	Written	14th week

c- Weighting of assessments

1	**Mid-term examination**	**10 %**
2	**Final-term examination**	**50 %**
3	**Oral examination**	**15 %**
4	**Practical examination & Semester work**	**25 %**
5	**Other types of assessment**	**0**
Total		**100%**

6 - List of References

N0.	Reference	type
1	Lectures notes, prepared by Staff Members of the Department	Course note
2	Practical notes, prepared by Staff Members of the Department	Course notes
3	Instrumental Methods of Chemical Analysis، Galan W. Ewing, 5th ed. McGraw-hill book company, New York (1995).	books
4	Principles of Instrumrntal Analysis, Skoog, D. A. Holler, F. J. and Crouch, S.R. 6th ed., Thomson، Belmont, USA (2007)	books
5	Pharmaceutical Analytical Chemistry، Quantitative Analysis, Amer, M.M. Faculty of Pharmacy, Cairo University	books
6	Fundamentals of Analytical Chemistry , Douglas A.; Skoog ; Donald M., West, F. James Holler، Stanely, R.Crouch Thomson, Australia , 9th Edition (2013).	books
7	Analytical Chemistry, Gary D. Christian, 6th ed. John Wiely and Sons, New York (2004(	books
8	ICH Harmonized Tripartite Guideline، Validation of Analytical Procedures: Text and Methodology, Q2(R1), Current Step 4 Version، Parent Guidelines on Methodology Dated November 6; 1996, Incorporated in November 2005	books

9	Quantitative Chemical Analysis, Daniel C . Books Harris, 8th ed., W.H. Freeman and Company، New York (2011)	books
10	Practical Pharmaceutical Chemistry, par II، Beckett, A. H. and Stenlake, J. B. 4th ed،. Cambridge, England (2001)	books
11	Vogel,s Textbook of Quanitative Chemical Analysis, J. Mendham, M.A, MSc, C. Chem, M. RSC, 6th ed., India (2004)	books

7- 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 of TLC	1	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
2.	HPLC, instrumentation and applications.	2	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
3.	GC, instrumentation and applications	3	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
4.	Capillary electrophoresis.	4	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
5.	Potentiometry principles and instrumentation	5	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
6.	Potentiometric titration and its pharmaceutical applications.	7	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
7.	Midterm Exam					
8.	Conductometry principles and instrumentation	8	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
9.	Application of conductometry and introduction of polarography	9	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
10	Polarography instrumentation and applications.	10	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5
11	Mass Spectrometry.	11	a1, a2	b1, b2	c1, c2	d1,d2,d3,d4,d5

Course Coordinator :	Prof. Dr Fatma El Zahraa Ahmed.
Head of department	Yasser El Shabrawy.