Mansoura University
Faculty of Pharmacy
Pharmaceutical Analytical Chemistry
Department

Pharmaceutical Analytical Chemistry Department Guide

2021/2022

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University and Faculty Administration

President of Mansoura University
Prof. Ashraf Mohamed Abdel Basset

Vice-President of Postgraduate Studies, Research and Cultural Relations
Prof. Ashraf Tarek Hafez

Vice-President for Community Service and Environmental Development Affairs
Prof. Mahmoud El-Meligy

Vice President for Education and Student Affairs
Prof. Mohamed Al-Bayoumy

Dean of Faculty of Pharmacy
Prof. Manal Mohammed Eid
Prof. of Pharmaceutical Analytical Chemistry

Vice-Dean of Postgraduate Studies and Research
Prof. Khalid B. Selim

Vice-Dean for Community Service and Environmental Development Affairs
Prof. Yasser El-Shabrawy

Vice Dean for Education and Student Affairs
Prof. Rasha Fathy Barwa

Head of Pharmaceutical Analytical Chemistry Department
Prof. Jenny Jeehan Nasr
Prof. of Pharmaceutical Analytical Chemistry

College Mission and Vision

College mission:

The College of Pharmacy, Mansoura University, is committed to continuously upgrading and developing its study programs, scientific research, and community service to graduate distinguished pharmacists to meet.

The needs of the labor market and the preparation of researchers at an internationally competitive level within the framework of academic standards and societal values.

College Vision:

Leadership and excellence in education, scientific research, and community service locally and internationally in all pharmaceutical fields.

Department Mission and Vision

Department Mission:

The Department of Pharmaceutical Analytical Chemistry aims to provide students with information and practical skills that qualify them to identify chemicals and conduct pharmaceutical analysis of drugs in pharmaceutical preparations and biological fluids and analysis of water and various foodstuffs. The department also aims to raise the level of scientific research in the areas of drug quality control, as well as upgrade its role in community service.

Department Vision:

The Department of Pharmaceutical Analytical Chemistry seeks to keep abreast of recent developments in pharmaceutical analytical techniques using advanced analytical devices and follow-up of modern scientific periodicals so that the department can provide a good service to the community in the field of drug manufacturing and drug quality control. The department also seeks to gain a distinguished position among the college departments in the various fields of teaching, as well as achieve excellence in social relations at all levels within the department.

Department Goals and Features

Department Goals:

• The Department of Pharmaceutical Analytical Chemistry specializes in teaching analytical chemistry and its vital role in all areas of life.

• The department aims to provide students with information and scientific skills that qualify them to work in pharmaceutical companies and research centers. The department also contributes with the rest of the college departments in preparing a student capable of serving the surrounding community.

• The department teaches physical chemistry, analytical chemistry, and automatic drug analysis using traditional teaching methods in addition to modern electronic methods to achieve standard academic standards.

• The Department of Pharmaceutical Analytical Chemistry effectively contributes to serving the surrounding community by providing specialized scientific consultations in the field of drug analysis for pharmaceutical companies and research centers, through faculty members working as advisors to those bodies. The department also contributes directly to serving the surrounding community by contributing to the activities of the Drug Analysis Unit, where the unit is run by a professor in the department.

• The department seeks to keep abreast of recent developments in the field of scientific research by holding periodic seminars and workshops to keep abreast of new developments in the field of scientific research and to know all that is new in the world of pharmacy and alternative medicine.

• The department aims to enhance the skills of faculty members, the supporting staff, and workers by holding periodic seminars, workshops, training courses, and participating in local and international scientific seminars and conferences.

Department Features:

• The department contributes significantly to scientific publishing for college scientific research in specialized international scientific journals, where much scientific research is extracted from master and doctoral theses and from individual research carried out by the department members.

• The scientific research in the department is characterized by keeping pace with global trends in the field of drug analysis and its various applications.

• The scientific research in the department directly serves the surrounding community, where innovative analytical methods can be applied in laboratories of quality control and quality assurance in pharmaceutical companies.

• Analytical chemistry applications are characterized by their diversity as they extend to serve many different branches of science such as drug quality control, water analysis, food analysis, forensic analysis, cosmetics industry, and chemicals and detergents industry.

• Drug analysis is a common factor in one way or another among all pharmaceutical sciences. Therefore, the department teaches automated drug analysis to all master's students in all departments of the college as part of the pre-master courses.

Subspecialties of research

• Pharmaceutical Analytical Chemistry Department is specialized in developing new analytical methods to determine the concentrations of organic and inorganic compounds in pharmaceutical preparations and the environment, in addition to determining them in biological fluids.

• The department also specializes in developing new methods for extracting inorganic and organic compounds from the environment, analyzing them, and determining their concentrations.

• The Department of Pharmaceutical Analytical Chemistry is concerned with studying the stability of drugs and determining their validity period.

• The department is also concerned with determining the degree of purity of raw materials and medicines.

• The department is also concerned with studying the bioavailability of different drugs.

The organizational structure of the department

A statement of the names of the heads of the Analytical Chemistry Department since 1990:

Name	Period	
	From	To
Prof. Mohammed Ibrahim Walash	1990/9/30	1994/11/4
Prof. Fathalla Fathalla Belal	1994/11/5	1995/11/11
Prof. Mohammed Salim Rizk	1995/11/12	1997/10/14
Prof. Mohie Khaled Sharaf El-Din	1997/10/20	1998/4/18
Prof. Mohammed Ibrahim Walash	1998/7/27	2000/7/31
Prof. Mohammed Salim Rizk	2000/8/1	2001/8/8
Prof. Mohie Khaled Sharaf El-Din	2001/8/9	2005/2/5
Prof. Amina Mohamed Elbrashy	2005/3/13	2009/3/4
Prof. Fathalla Fathalla Belal	2009/4/15	2010/7/31
Prof. Nahed El-enany	2010/8/10	2011/8/9
Prof. Fathalla Fathalla Belal	2012/1/1	2014/7/31
Prof. Fatma Ahmed Aly	2014/8/3	2017/7/31
Prof. Yasser El-Shabrawy	2017/8/1	2020/7/29
Prof. Nahed El-enany	2020/8/1	2021/8/30
Prof. Jenny Jeehan Nasr	2021/9/1	Now

Department staff and staff assistants

	**Prof. Mohammed Ibrahim Walash**		**Prof. Fathalla Fathalla Belal**		**Prof. Mohie Khaled Sharaf El-Din**
	**Prof. Fawzia Ahmed Ibrahim**		**Prof. Amina Mohamed El-Brashy**		**Prof. Mohamed El-Sayed Metwally**
	**Prof. Fatma Elzahraa Ahmed Aly**		**Prof. Mohamed Hefnawy**		**Prof. Nahed El-Enany**
	**Prof. Manal Mohamed Eid** Dean		**Prof. Yasser El-Shabrawy** Vice Dean for Environmental Affairs and Community Service		**Prof. Jenny Jeehan Nasr** Head of Department
	**Prof. Shereen Shalan**		**Prof. Manar Mohamed Tolba**		**Associate Prof. Zeinab Awad Sheribah**
	**Associate Prof. Fatma Basiouny**		**Associate Prof. Rania El-Shaheny**		**Associate Prof. Mary Elias Wahba**
	**Associate Prof. Mohamed Ibraheem El-Awady**		**Associate Prof. Mona Elsayed Fathy FathAllah**		**Associate Prof. Samah Abo El Abass Mohamed**
	**Associate Prof. Heba Elmansi**		**Associate Prof. Mohamed Mansour Salim**		**Associate Prof. Fawzi Elsebaei**

	**Associate Prof. Rania El-Gamal**		**Associate Prof. Mahmoud Hamed El-Maghrabey**		**Dr. Samar Saad El Sayed Moustafa**
	**Dr. Rasha Ahmed Aboshabana**		**Dr. Mohamed Ibrahim Halawa**		**Dr. Abdallah Mohammed Zeid**
	**Dr. Ibraam Emad Mikhail**		**Dr. Asmaa Kamal El-Deen**		**Heba Abd El-aziz Osman** Assistant Lecturer
	**Nora Abdallah** Assistant Lecturer		**Heba Samir Elama** Assistant Lecturer		**Mona El sayed Fathy Hamdy El Sharkasy** Assistant Lecturer
	**Norhan Attaa Mahfouz Mohamed Bakr** Assistant Lecturer		**Maryam Alsharqawy** Demonstrator		**Eman Yosrey** Demonstrator
	**Shymaa Mostafa Mohamed Abd Elhaleem** Demonstrator		**Shrouk Abo Elkheir** Demonstrator		**Walaa Nabil Abd-AlGhafar** Demonstrator
	**Diaa Dagher** Demonstrator		**Neamat Tarek** Demonstrator		**Mohamed Mohamed Abdelaziz Osman** Demonstrator
	**Yasmeen Esmail Mostafa** Demonstrator		**Rana Gamal Gad** Demonstrator		

Scopus links

	Staff name	Scopus link
1	Prof. Mohammed Ibrahim Walash	https://www.scopus.com/authid/detail.uri?authorId=7004048110
2	Prof. Fathalla Fathalla Belal	https://www.scopus.com/authid/detail.uri?authorId=56256873300
3	Prof. Mohie Khaled Sharaf El-Din	https://www.scopus.com/authid/detail.uri?authorId=6507616234
4	Prof. Fawzia Ahmed Ibrahim	https://www.scopus.com/authid/detail.uri?authorId=24351804300
5	Prof. Amina Mohammed El-Brashy	https://www.scopus.com/authid/detail.uri?authorId=6701838170
6	Prof. Mohamed El-Sayed Metwally	https://www.scopus.com/authid/detail.uri?authorId=55342214600
7	Prof. Fatma Elzahraa Ahmed Aly	https://www.scopus.com/authid/detail.uri?authorId=7006018498
8	Prof. Mohamed Hefnawy	https://www.scopus.com/authid/detail.uri?authorId=7003826560
9	Prof. Nahed El-Enany	https://www.scopus.com/authid/detail.uri?authorId=6603684217
10	Prof. Manal Eid	https://www.scopus.com/authid/detail.uri?authorId=8577380500
11	Prof. Yasser El-Shabrawy	https://www.scopus.com/authid/detail.uri?authorId=6603198171
12	Prof. Jenny Jeehan Nasr	https://www.scopus.com/authid/detail.uri?authorId=16176263100
13	Prof. Shereen Shalan	https://www.scopus.com/authid/detail.uri?authorId=54988351700
14	Prof. Manar Mohamed Tolba	https://www.scopus.com/authid/detail.uri?authorId=21740124900
15	Assoc. Prof. Rania El-Shaheny	https://www.scopus.com/authid/detail.uri?authorId=35088208500
16	Assoc. Prof. Mary Wahba	https://www.scopus.com/authid/detail.uri?authorId=36164813800
17	Assoc. Prof. Mohamed Ibraheem Elawady	https://www.scopus.com/authid/detail.uri?authorId=55375905300
18	Assoc. Prof. Mona Elsayed Fathy	https://www.scopus.com/authid/detail.uri?authorId=15131202100

	Staff name	Scopus link
19	Assoc. Prof. Samah Abo El Abass	https://www.scopus.com/authid/detail.uri?authorId=36522553200
20	Assoc. Prof. Heba Elmansi	https://www.scopus.com/authid/detail.uri?authorId=36140071600
21	Assoc. Prof. Mohamed Mansour Salim	https://www.scopus.com/authid/detail.uri?authorId=36115167300
22	Assoc. Prof. Fawzi Elsebaei	https://www.scopus.com/authid/detail.uri?authorId=37101393000
23	Assoc. Prof. Rania El Gamal	https://www.scopus.com/authid/detail.uri?authorId=15055737800
24	Assoc. Prof. Mahmoud El-Maghrabey	https://www.scopus.com/authid/detail.uri?authorId=41661263300
25	Dr. Samar Saad	https://www.scopus.com/authid/detail.uri?authorId=36603190400
26	Dr. Abdallah Mohammed Zeid	https://www.scopus.com/authid/detail.uri?authorId=56702405300
27	Dr. Mohamed Ibrahim Halawa	https://www.scopus.com/authid/detail.uri?authorId=57191569657
28	Dr. Rasha Ahmed Aboshabana	https://www.scopus.com/authid/detail.uri?authorId=57204352485
29	Dr. Ibraam Emad Mikhail	https://www.scopus.com/authid/detail.uri?authorId=56262481100
30	Dr. Asmaa Kamal El-Deen	https://www.scopus.com/authid/detail.uri?authorId=57132736500
31	Heba Abd El-Aziz	https://www.scopus.com/authid/detail.uri?authorId=57222052154
32	Nora Abdallah	https://www.scopus.com/authid/detail.uri?authorId=57204582887
33	Heba Samir Elama	https://www.scopus.com/authid/detail.uri?authorId=57204529264
34	Mona El sayed El sharkasy	https://www.scopus.com/authid/detail.uri?authorId=57211940266
35	Norhane Attaa Bakr	https://www.scopus.com/authid/detail.uri?authorId=57214331838
36	Eman Yosrey	https://www.scopus.com/authid/detail.uri?authorId=57397768500
37	Shymaa Mostafa Abd Elhaleem	https://www.scopus.com/authid/detail.uri?authorId=57259294000
38	Walaa Nabil Abd-AlGhafar	https://www.scopus.com/authid/detail.uri?authorId=57217094174

Staff, technicians, and workers in the department

Technicians

	Name	Notes
1	Mrs. Mona Alhadidi	Working
2	Mrs. Soaad Fathy Aldesoky	Working
3	Mrs. Ghada Meatamed Elsayed	Working
4	Mrs. Wafaa Mosbah Abdalmotaleb	Working
5	Mrs. Alaa Mohamed Ibrahim Alshamy	Working
6	Mr. Ahmed Salah Elsayed Mostafa	Working
7	Mrs. Samah AbdElghany Ahmed	Spouse accompanying leave

Administrators

	Name	Notes
1	Mrs. Azza Mosbah Eldriny	Secretary
2	Mrs. Rasha Talaat Sobhy	Secretary

Lab specialist

	Name	Notes
1	Dr. Heba Maher Ramadan	Working

Workers

	Name	Notes
1	Mrs. Nagat Farouk Mohamed Elsayed	Working
2	Mrs. Mohamed Elmetwaly Elmetwaly	Working
3	Mrs. Ommohamed Abdelfatah Mohamed	Working-Temporary
4	Mr. Hamza Hamed Ahmed Eldiasty	Working- Temporary
5	Mrs. Rania Mohamed Younes	Working- Temporary

The infrastructure of the department

The Department of Pharmaceutical Analytical Chemistry includes the fourth and fifth floors of the educational building (C), which contains the following:

	Infrastructure items	Purpose
1	Department Council room on the 4th floor	Meetings and Seminars
2	Staff rooms	For staff use
3	Staff assistants' rooms (2)	For staff assistants' use
4	Student Laboratories (4)	Student practical classes
5	Research lab on the fourth floor	Scientific research in the department
6	Technicians and workers' room	For technicians and workers use

The department scientific instruments

1.

Equipment Name	884 Professional VA/CVS instrument
Number of units	1
Manufacturing Country	Switzerland
Manufacturer	Metrohm
Usages	Voltammetry and CVS system
Photo	
Manufacturer WebSite	www.metrohm.com

2.

Equipment Name	Cary Eclipse Fluorescence Spectrophotometer
Number of units	1
Manufacturing Year	2016
Manufacturing Country	USA
Manufacturer	Agilent Technologies Cary Eclipse
Usages	Fluorescence detection of different materials
	
Manufacturer WebSite	www.agilent.com/chem

3.

Equipment Name	Double beam spectrophotometer
Number of units	2
Model	6850
Manufacturing Country	UK
Manufacturer	Jenway
Usages	Quality control, general research, pharmaceutical, biochemical, and clinical laboratory applications.
	
Manufacturer WebSite	http://www.jenway.com

4.

Equipment Name	Spectro UV-VIS Double Beam PCScanning Spectrophotometer
Number of units	1
Model	UVD-2950
Manufacturing Country	U.S.A
Manufacturer	Labomed, Inc
Usages	qualitative and quantitative analysis in such fields as pharmaceutical inspection, clinical analysis, petro-chemistry laboratories, chemistry, and biochemistry laboratories
	
Manufacturer WebSite	http://www.labomed.com

5.

Equipment Name	Ultrasonic Bath
Number of units	1
Model	WUC-D06H
Manufacturing Country	Korea
Manufacturer	Washbasin Daihan
Usages	ultrasonic cleaning—loosening particles adhering to surfaces, solvation of some materials and degassing of HPLC solutions
	
Manufacturer WebSite	www.vattuykhoa.com

6.

Equipment Name	Ultrasonic Cleaner
Number of units	1
Model	ST164 Benchtop
Manufacturer	Sonix 4
Usages	ultrasonic cleaning—loosening particles adhering to surfaces, solvation of some materials and degassing of HPLC solutions
	
Manufacturer WebSite	https://www.dentalcompare.com

7.

Equipment Name	Centrifuge benchtop
Number of units	1
Model	Sigma 2-16P
Manufacturing Country	Germany
Manufacturer	Sigma
Usages	Centrifugation of deferent materials
	
Manufacturer WebSite	https://www.wolflabs.co.uk

8.

Equipment Name	analytical balance
Number of units	1
Model	220V AC
Manufacturing Country	Germany
Manufacturer	Kern
Usages	Weighting of the materials
	
Manufacturer WebSite	https://www.kern-sohn.com

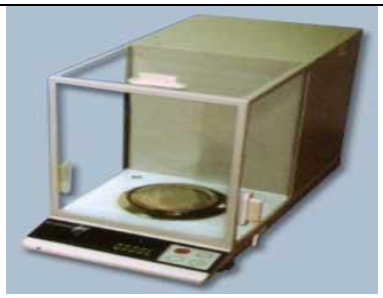
9.

Equipment Name	Colorimeter
Number of units	1
Model	6051
Manufacturing Country	UK
Manufacturer	Jenway
Usages	Qualitative and quantitative determination of the most colored materials
	
Manufacturer WebSite	http://www.jenway.com

10.

Equipment Name	Balance
Number of units	1
Model	PGW 253i
Manufacturing Country	United Kigdom
Manufacturer	Adam Equipment
Usages	Weighting of solid materials
	

11.

Equipment Name	Electronic Analytical Balance
Number of units	1
Model	WH Series
Manufacturer	wiggenhauser
	

12.

Equipment Name	Conductivity meter
Number of units	4
Model	SensoDirect Con 110
Manufacturer	SensoDirect
Usages	Determination of conductivity.
	

13.

Equipment Name	Double Distillation Cabinet Stills
Number of units	1
Model	WSC/4D
Manufacturer	Hamilton
Usages	Distillation of water
	

14.

Equipment Name	Double Distillation
Number of units	1
Model	4 LPH
Manufacturer	Stuart Aquatron
	

15.

Equipment Name	Magnetic stirrer with hotplate
Number of units	1
Model	MSH-A
Manufacturer	witeg
Usages	Mixing of chemical, laboratory and pharmaceutical materials, heat-sensitive procedures in microbiology and biochemistry, sample drying
	

16.

Equipment Name	Glass Ceramic Analogue Hot Plate
Number of units	**1**
	
Manufacturer WebSite	http://glasscolabs.com

17.

Equipment Name	pH/mV/Temperature Meter
Number of units	2
Model	JENWAY 3505
Manufacturer	JENWAY
	
Manufacturer WebSite	http://www.jenway.com

18.

Equipment Name	Benchtop pH/mV/°C/°F Meter
Number of units	8
Model	PH-27B
Manufacturing Country	U.S.A
Manufacturer	Acculab
	
Manufacturer WebSite	https://acculabusa.com

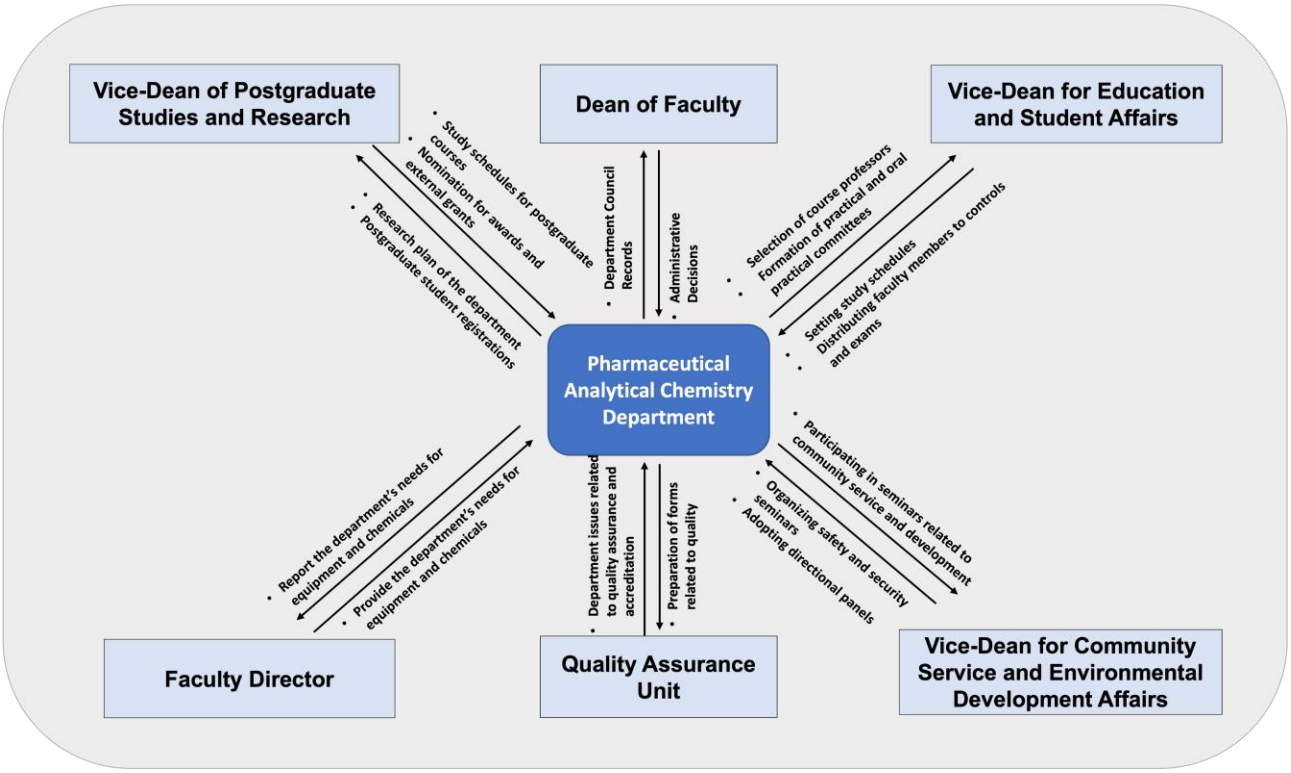
19.

Equipment Name	Vortex Mixer
Number of units	2
Model	ZX4
Manufacturer	VELP
	

20.

Equipment Name	UV Lamp
Number of units	2
Model	VL-4.L
Manufacturer	Vilber Lourmat
	
Manufacturer WebSite	http:/www.vilber.com

Interactions between the department and the college administration



Department courses

Pharm.D program

Levels	Semester	Course name	Course code
Level 1	**First Semester**	Pharmaceutical Analytical Chemistry I	PA111
	Second Semester	Pharmaceutical Analytical Chemistry II	PA122
Level 2	**First Semester**	Pharmaceutical Analytical Chemistry III	PA213
	Second Semester	Instrumental Analysis	PA224
Level 4	**Second Semester**	Quality Control and Pharmaceutical Analysis	PA425
Elective courses		Advanced Pharmaceutical Analysis - Spectroscopy	PAE 01
		Therapeutic Drug Monitoring	PAE 02

Credit Hours Program

Levels	Semester	Course name	Course code
Level 1	**First Semester**	Physical Chemistry	PA 111
	Second Semester	Inorganic Chemistry	PA 122
Level 2	**First Semester**	Pharmaceutical Analytical Chemistry I	PA 213
	Second Semester	Pharmaceutical Analytical Chemistry II	PA 224
Level 3	**First Semester**	Instrumental and Applied Analysis	PA 315
Level 4	**Second Semester**	Quality Control and Pharmaceutical Analysis	PA 426
Elective courses		Therapeutic drug monitoring	PAE 10
		Food analysis	PAE 11

Clinical Pharmacy program- Pharm D

Levels	Semester	Course name	Course code
Level 1	**First Semester**	Pharmaceutical Analytical Chemistry I	PC 101
	Second Semester	Pharmaceutical Analytical Chemistry II	PC 203

Clinical Pharmacy program

Levels	Semester	Course name	Course code
Level 1	**First Semester**	Physical Chemistry	PC 101
	Second Semester	Inorganic Chemistry	PC 105
Level 2	**First Semester**	Pharmaceutical Analytical Chemistry I	PC 205
	Second Semester	Pharmaceutical Analytical Chemistry II	PC 306
Level 3	**First Semester**	Instrumental and Applied Analysis	PC 407
Level 4	**Second Semester**	Quality Control of Drugs	PC 808
Elective course		Advanced Pharmaceuticaal Analysis (spectroscopic analysis)	PCE 01

Quality Control and Drug Analysis Diploma (PAD-10)

	Course name	**Code No.**
	Spectrometry	PAD-101
	Quality Control of Drugs	PAD-102
	Stability of Pharmaceutical Dosage Forms	PAD-103
	Separation Techniques	PAD-105
	Electrochemistry	PAD-106
	Quality Assurance	PAD-107
Elective courses	Food, Nutraceuticals and cosmetics Analysis	PAD-108
	Statistics and Biostatistics	PAD-110
	Physical Chemistry	PAD-112

MS.D. Courses (General Courses) (GCM-200)

	Course name	**Code No.**
General Courses	Instrumental Analysis	GCM-201
	Physical chemistry	GCM-203

MS.D. Courses (Pharmaceutical Analytical Chemistry Courses) (PAM-200)

	Course name	**Code No.**
Pharmaceutical Analytical Chemistry	Quality control of drugs	PAM-201
	Electrochemical Analysis	PAM-202
	Separation Techniques	PAM-203

MS.D. Courses (Elective Courses) (PAM-2EC)

	Course name	Code No.
Elective course	Therapeutic Drug Monitoring	PAM-204
	Chemometrics	PAM-205
	Environmental Analysis	PAM-206

PhD courses

Course name	Code No.
Automatic analysis	PAP301
Advanced Separation Techniques	PAP302
Advanced Electroanalytical Chemistry	PAP303
Environmental Analysis	PAP305

Scientific publishing in international journals

Recent research published in local and international conferences and journals for the year 2020/2021

#	Title	Authors	Journal	Year
1	Simultaneous spectrophotometric quantitative analysis of elbasvir and grazoprevir using assisted chemometric models	Zeid, A.M., Abdelazim, A.H., Shahin, M.	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy. 252, 119505	2021
2	Multi-spectroscopic and molecular docking studies for binding interaction between fluvoxamine and human serum albumin	Salim, M.M., El Sharkasy, M.E., Belal, F., Walash, M.	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 252, 119495	2021
3	Green one-pot synthesis of nitrogen and sulfur co-doped carbon quantum dots as new fluorescent nanosensors for determination of salinomycin and maduramicin in food samples	Magdy, G., Abdel Hakiem, A.F., Belal, F., Abdel-Megied, A.M.	Food Chemistry. 343, 128539	2021
4	Simultaneous spectrophotometric quantitative analysis of velpatasvir and sofosbuvir in recently approved FDA pharmaceutical preparation using artificial neural networks and genetic algorithm artificial neural networks	Khalid A.M.Attia, Nasr M.El-Abasawi, Ahmed El-Olemy, Ahmed H.Abdelazim, Abdelrahman I.Goda, Mohammed Shahin, Abdallah M.Zeid	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 251, 119465	2021
5	Development of an Inexpensive, sensitive and green HPLC method for the simultaneous determination of brivaracetam, piracetam and carbamazepine; application to pharmaceuticals and human plasma	Mansour, N.M., El-Sherbiny, D.T., Ibrahim, F.A., El Subbagh, H.I.	Microchemical Journal 163, 105863	2021
6	Micelle-Enhanced conventional and synchronous spectrofluorimetric methods for the simultaneous determination of lesinurad and febuxostat: Application to human plasma	Magdy, G., Belal, F.F., Abdel-Megied, A.M., Abdel Hakiem, A.F.	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 248, 119239	2021
7	OFAT versus DOE as two optimization protocols for the	Sherbiny, D.E.L., Wahba, M.E.K	Acta Chromatographica 33	2021

	chromatographic analysis of some OTC pharmaceuticals carrying negative cardiovascular effects and administered by pregnant and breast-feeding females: Application to dose dependent effect		(1), pp 11 - 24	
8	Inclusive study for segregation of two commonly used anticancer drugs with tramadol: Applying a green fluorimetric strategy to pharmaceutical dosage forms and human plasma	Tolba, M.M., Salim, M.M	Microchemical Journal 162, 105859	2021
9	A Flavin Derivative-Based Fluorometric Analysis for the Diabetes Mellitus Inducer, Alloxan, for Its Follow-up in Flour and Flour-Derived Food	Al Shehri, Z.S., Derayea, S.M., El-Maghrabey, M.H., El Hamd, M.A.	Food Analytical Methods 14 (3), pp. 473 - 484	2021
10	High-temperature liquid chromatography for evaluation of the efficiency of multiwalled carbon nanotubes as nano extraction beds for removal of acidic drugs from wastewater. Greenness profiling and comprehensive kinetics and thermodynamics studies	Lateefa A.Al-Khateeb, Mona A.Al-zahrani, Mohamed A.El Hamd, MahmoudEl-Maghrabey, Fatimah A.Dahas, RaniaEl-Shaheny	Journal of Chromatography A 1639, 461891	2021
11	Spider diagram and Analytical GREEnness metric approach for assessing the greenness of quantitative 1H-NMR determination of lamotrigine: Taguchi method based optimization	Abou-Taleb, N.H., El-Enany, N.M., El-Sherbiny, D.T., El-Subbagh, H.I.	Chemometrics and Intelligent Laboratory Systems 209, 104198	2021
12	Design of a dual functionalized chemiluminescence ultrasensitive probe for quinones based on their redox cycle. Application to the determination of doxorubicin in lyophilized powder and human serum	El-Maghrabey, M., Kishikawa, N., Kamimura, S., Ohyama, K., Kuroda, N.	Sensors and Actuators, B: Chemical 329, 129226	2021
13	Development and validation of GC–MS method for determination of methcathinone and its main metabolite in mice plasma and brain tissue after SPE: Pharmacokinetic and	Yousef A.Bin Jardana, Khaled Mohamed, Nagwan Abbas, Manal El-Gendy, Nawaf Alsaif, Mohammed Alanazi, Mostafa Mohammed, Mohammed	Journal of Pharmaceutical and Biomedical Analysis 194, 113798	2021

	distribution study	Abounassif, Mohamed Hefnawy		
14	Determination of three antiepileptic drugs in pharmaceutical formulations using microfluidic chips coupled with light-emitting diode induced fluorescence detection	Abdallah M. Zeid, Jenny Jeehan M.Nasr, FathallaBelal, Mohamed I.Walash, Yoshinobu Baba, Noritada Kaji	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 246, 119021	2021
15	Utility of NBD-Cl as an electrophilic reagent for the determination of the two antihypertensive drugs hydrochlorothiazide and minoxidil in dosage forms and human urine samples	Elmansi, H., Belal, F., M.Hosny, M., M.EL-Abassy, O.	Chemical Papers	2021
16	A Novel Eplerenone Ecofriendly Fluorescent Nanosensor Based on Nitrogen and Sulfur-Carbon Quantum Dots	Belal, F., Mabrouk, M., Hammad, S., Barseem, A., Ahmed, H	Journal of Fluorescence 31(1), pp. 85 - 90	2021
17	Effect of low-energy shock wave therapy on intravesical epirubicin delivery in a rat model of bladder cancer	Ahmed Elkashef, Nashwa Barakat, Sherry M. Khater, Amira Awadalla, Fathallah Belal, Ahmed M. El-Assmy, Khaled Z. Sheir, Ahmed A. Shokeir	BJU International 127(1), pp. 80-89	2021
18	Development of luminol-based chemiluminescence approach for ultrasensitive sensing of Hg (II) using povidone-I2 protected gold nanoparticles as an efficient coreactant	Halawa, M.I., Wu, G.X., Li, B.S.	Analytical and Bioanalytical Chemistry 413 (2), pp. 649-659	2021
19	Amplified anodic electrogenerated chemiluminescence of tris (2,2′-bipyridyl) ruthenium (II) for ultrasensitive detection of bambuterol: Application to content uniformity testing	Halawa, M.I., Mostafa, I.M., Wu, G., Li, B.S.	Journal of Electroanalytical Chemistry 880, 114881	2021
20	Microfluidic fast chiral separation of baclofen and phenylalanine enantiomers based on cyclodextrin-electrokinetic chromatography	Abdallah M.Zeid, Jenny Jeehan M.Nasr, Fathalla Belal, Mohamed Walash, Noritada Kaji, Yoshinobu Baba	Microchemical Journal 160, 105770	2021
21	In-Syringe Electrokinetic	Mikhail, I.E., Tehranirokh,	Angewandte Chemie -	2020

	Protein Removal from Biological Samples prior to Electrospray Ionization Mass Spectrometry	M., Gooley, A.A., Guijt, R.M., Breadmore, M.C.	International Edition 59(51), pp. 23162-23168	
22	Investigation and greenness profiling of ethanol-based mobile phases for analysis of different ciprofloxacin formulations	Belal, F., Abdel-Razeq, S., Elmansi, H., Barghash, S.	Journal of the Iranian Chemical Society 17(12), pp. 3227 - 3236	2020
23	Quick simultaneous analysis of bambuterol and montelukast based on synchronous spectrofluorimetric technique: Simultaneous Analysis of BMB & MTK	El Gamal, R., El Abass, S.A., Elmansi, H.M	Royal Society Open Science 7 (12), 201156	2020
24	A novel application of deep eutectic solvents in quantitative nuclear magnetic resonance using grey relational analysis for multi-response optimization	Abou-Taleb, N.H., El-Sherbiny, D.T., El-Enany, N.M., El-Subbagh, H.I.	Chemometrics and Intelligent Laboratory Systems 206, 104125	2020
25	Effective quantification of ravidasvir (an NS5A inhibitor) and sofosbuvir in rat plasma by validated LC-MS/MS method and its application to pharmacokinetic study	Mohamed Hefnawy et. al.	Arabian Journal of Chemistry 13 (11), pp. 8160 - 8171	2020
26	An eco-friendly HPLC-UV method for the determination of risedronate in its bulk and tablet dosage form with application to content uniformity, dissolution and stability testing	Moustapha, M.E., Kamal, M., Elgamal, R.M.	Saudi Pharmaceutical Journal 28 (11), pp. 1301 - 1308	2020
27	Electrochemiluminescence of $Ru(bpy)_3^{2+}$/Oxamic Hydrazide and its Application for Selective Detection of 4-Nitrobenzaldehyde	Fan Yuan, Dr. Mohamed Ibrahim Halawa, Xiangui Ma, Abubakar Abdussalam, Dr. Baohua Lou, Prof. Guobao Xu	ChemElectroChem 7 (20), pp. 4239-4244	2020
28	A green air assisted-dispersive liquid-liquid microextraction based on solidification of a novel low viscous ternary deep eutectic solvent for the enrichment of endocrine disrupting compounds from water	El-Deen, A.K., Shimizu, K	Journal of Chromatography A 1629, 461498	2020

29	Studying the effect of vasopressors on therapeutic drug monitoring of two local anesthetics using hybrid micelle liquid chromatography as an analysis tool	El Sherbiny, D., Wahba, M.E.K	Journal of Chromatography B 1154, 122277	2020
30	Analysis of clozapine in its tablets using two novel spectrophotometric reactions targeting its tertiary amino group	Ayman, A., Zeid, A.M., Wahba, M.E.K., EL-Shabrawy, Y.	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 238, 118447	2020
31	Evaluation of the Pharmacokinetics of the Simultaneous Quantification of Letrozole and Palbociclib in Rat Plasma by a Developed and Validated HPLC-PDA	Al-Shehri, M., Hefnawy, M., Abuelizz, H., Alzamil, A.	Acta Chromatographica 32 (3), pp. 170-178	2020
32	Sustainable environment-friendly quantitative determination of three anti-hyperlipidemic statin drugs and ezetimibe in binary mixtures by first derivative Fourier transform infrared (FTIR) spectroscopy	Nasr, J.J.M., Al-Shaalan, N.H., Shalan, S.M.	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 237, 118332	2020
33	Combining derivative and synchronous approaches for simultaneous spectrofluorimetric determination of terbinafine and itraconazole: Terbinafine and Itraconazole assay	Elmansi, H., Roshdy, A., Shalan, S., El-Brashy, A	Royal Society Open Science7 (8), 200571	2020
34	Development and validation of eco-friendly micellar HPLC method for the simultaneous determination of hydrochlorothiazide and valsartan in bulk powder and pharmaceutical dosage forms	Ayad, M.M., Hosny, M.M., Ibrahim, A.E., El-Abassy, O.M., Belal, F.F.	Journal of the Iranian Chemical Society 17 (7), pp. 1725-1730	2020
35	Capillary electrophoresis with field-amplified sample stacking for simultaneous determination of indacaterol and glycopyrronium in inhaler capsules: Application to human plasma and urine	Zayed, S., Belal, F.	Microchemical Journal 155, 104779	2020
36	Synchronous	Saad Radwan, A., Salim,	Luminescence 35 (4),	2020

	spectrofluorometric methods for simultaneous determination of diphenhydramine and ibuprofen or phenylephrine in combined pharmaceutical preparations	M.M., Hammad, S.F	pp. 550-560	
37	Multiobjective optimization of microemulsion- thin layer chromatography with image processing as analytical platform for determination of drugs in plasma using desirability functions	Abou-Taleb, N.H., El-Sherbiny, D.T., El-Enany, N.M., El-Subbagh, H.I.	Journal of Chromatography A 1619, 460945	2020
38	LC-MS/MS determination of erdafitinib in human plasma after SPE: Investigation of the method greenness	Elawady, T., Khedr, A., El-Enany, N., Belal, F	Microchemical Journal 154, 104555	2020
39	Development of $Ru(bpy)_3^{2+}$-amisulpride electrogenerated chemiluminescence system for ultrasensitive and selective detection of amisulpride in pharmaceuticals and real plasma	Halawa, M.I., Mostafa, I.M., Tolba, M.M., El-Shabrawy, Y., Li, B.S	Journal of Electroanalytical Chemistry 864, 114059	2020
40	Turn-on fluorescent glutathione detection based on lucigenin and MnO_2 nanosheets	Halawa, M.I. et al.	Journal of Materials Chemistry B 8(16), pp. 3542 - 3549	2020
41	Quantitative assessment of the nature of noncovalent interactions in: N -substituted-5-(adamantan-1-yl)-1,3,4-thiadiazole-2-amines: Insights from crystallographic and QTAIM analysis	Ali A. El-Emam, Elangovan Saveeth Kumar, Krishnakumar Janani, Lamya H. Al-Wahaibi, Olivier Blacque, Mohamed I. El-Awady, Nora H. Al-Shaalan, M. Judith Percino, and Subbiah Thamotharan	RSC Advances 10 (17), pp. 9840 - 9853	2020
42	Digitally enhanced thin layer chromatography for simultaneous determination of norfloxacin and tinidazole with the aid of Taguchi orthogonal array and desirability function approach: Greenness assessment by analytical Eco-Scale	Hemdan Abou-Taleb, N., Mahmoud El-Enany, N., Tawfik El-Sherbiny, D., Ibrahim El-Subbagh, H	Journal of Separation Science 43(6), pp. 1195 - 1202	2020
43	First derivative synchronous spectrofluorimetric method for the simultaneous determination of propofol and cisatracurium besylate in biological fluids	El Sharkasy, M.E., Walash, M., Belal, F., Salim, M.M.	Luminescence 35 (2), pp. 312 - 320	2020
44	A simple and economic	Zayed, S., Fouad, F., Belal,	Journal of the Iranian	2020

	chromatographic method for simultaneous determination of six bronchodilator drugs in pharmaceutical dosage forms	F.	Chemical Society	
45	Direct injection microemulsion HPLC method for simultaneous determination of morphine, tramadol and lornoxicam in biological fluids using monolithic column	Belal, F et. al	Current Pharmaceutical Analysis 16 (8), pp. 1148 - 1156	2020
46	Analysis of some pharmaceuticals in the presence of their synthetic impurities by applying hybrid micelle liquid chromatography	El Sherbiny, D., El Sherbiny, D., Wahba, M.E.K., Wahba, M.E.K.	Open Chemistry 18 (1), pp. 377-390	2020
47	Spectrofluorimetric investigation for determination of sumatriptan succinate: application to tablets and spiked human plasma	Abo Zaid, M.H., Abo El abass, S., El-Enany, N., Aly, F.	Luminescence	2020
48	The use of green spectroscopy with multivariate calibration models for simultaneous analysis of ternary drug mixture in combined oral antidiabetic pill	Belal, F., El-Shabrawy, Y., Barseem, A., Ahmed, H.	Spectrochimica Acta - Part A: Molecular and Biomolecular Spectroscopy 241, 118638	2020
49	Validated microwell-based spectrofluorimetric method for quantification of ravidasvir (New anti-chronic hepatitis c virus-gt4) in rat plasma and its application to pharmacokinetic study	Mohamed Hefnawy et. al.	Drug Design, Development and Therapy 14, pp. 4377-4385	2020
50	Development and validation of an UHPLC-MS/MS method for simultaneous determination of palbociclib, letrozole and its metabolite carbinol in rat plasma and pharmacokinetic study application	Mona Al-Shehria, Mohamed Hefnawy, Hatem Abuelizz. Adeeba Alzamil, Mostafa Mohammed, Nawaf Alsaif, Abdulrahman Almehizia, Hamad Alkahtani, Mohammed Abounassif	Arabian Journal of Chemistry 13, 4024 - 4034	2020
51	Synthesis of New Cyanopyridine Scaffolds and their Biological Activities	Nabil A. Alhakamy, Ahmad O. Noor, Khaled M. Hosny, Jenny Jeehan Nasr, Moustafa M.G. Fouda, Tawfik A. Khattab, Hatem E. Gaffer	Current Organic Synthesis 17, 567 - 575	2020

52	Conventional and first derivative synchronous spectrofluorimetric methods for the simultaneous determination of cisatracurium and nalbuphine in biological fluids	Mona E. El Sharkasy, M. Walash F. Belal M.M. Salim	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 228, 117841	2020
53	Genetic algorithm with model-updating based pls regression for the spectrophotometric determination of clopidogrel, atorvastatin, and aspirin in presence of its degradation product	M. M. Salim, Mona E. El, Sharkasy, M. Walash , F. Belal	Journal of applied spectroscopy	2020
54	Synthesis of New Cyanopyridine Scaffolds and Their Biological Broadcast	Nabil A Alhakamy, Ahmed O Noor, Khaled M Hosny, Jenny Jeehan Nasr, Moustafa MG Fouda, Tawfik A Khattab, Hatem E Gaffer	Current Organic Synthesis	2020
55	Sustainable environment-friendly quantitative determination of three anti-hyperlipidemic statin drugs and ezetimibe in binary mixtures by first derivative Fourier transform infrared (FTIR) spectroscopy	Jenny Jeehan Nasr, Nora Hamad Al-Shaalan, Shereen Shalan	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 237, 118332.	2020
56	Validated 1H and 19F Nuclear Magnetic Resonance for the Quantitative Determination of the Hepatitis C Antiviral Drugs Sofosbuvir, Ledipasvir, and Daclatasvir in Tablet Dosage Forms	Jenny Jeehan Nasr, Shereen Shalan	Microchemical Journal 152, 104437.	2020
57	Simultaneous estimation of amlodipine and atorvastatin by micelle-augmented first derivative synchronous spectrofluorimetry and multivariate analysis	Jenny Jeehan Nasr, Shereen Shalan	Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 224, 117430	2020
58	Integrative physicochemical and HPLC assessment studies for the inclusion of lornoxicam in buffalo's milk fat globules as a potential carrier delivery system for lipophilic drugs	Abdellatif AAH, El Hamd MA, Salman KH, Abd-El-Rahim AM, El-Maghrabey M, Tawfeek HM,	Microchemical Journal, 152, 104321.	2020

59	Utility of isotope-coded derivatization in gas chromatographic-mass spectrometric analyses with special emphasis on metabolomics.	El-Maghrabey MH, Kishikawa N, Kuroda N	Medical Mass Spectrometry 4, 1-12.	2020
60	Current trends in isotope-coded derivatization liquid chromatographic-mass spectrometric analyses with special emphasis on their biomedical application.	El-Maghrabey MH, Kishikawa N, Kuroda N	Biomedical Chromatography 34, e4756.	2020
61	A Smart Advanced Chemiluminescence-Sensing Platform for Determination and Imaging of the Tissue Distribution of Natural Antioxidants.	Kishikawa N, El-Maghrabey MH, Nagamune Y, Nagai K, Ohyama N, Kuroda N	Analytical Chemistry 92, 6984 – 6992.	2020
62	Quinone-based antibody labeling reagent for enzyme-free chemiluminescent immunoassays. Application to avidin and biotinylated anti-rabbit IgG labeling	El-Maghrabey MH, Kishikawa N, Harada S, Ohyama N, Kuroda N.	Biosensors and Bioelectronics, 2020, 160, 112215.	2020
63	Green highly sensitive spectrofluorimetric method for rapid determination of tafluprost in its pure form and ophthalmic formulation	Walaa Nabil Abd-Al Ghafar, Samar Saad, Zainab Sheribah, Fatma Aly	Luminescence	2020
64	A green stability-indicating RP-HPLC-UV method using factorial design for determination of ribavirin, sofosbuvir and ledipasvir: Application to average content, acid degradation kinetics and in vitro drug interactions study,	Hanan I. EL-Shorbagy, Fawzi Elsebaei, Sherin F. Hammad, Amina M. El-Brashy	Microchemical Journal 158, 105251	2020
65	Turn–on fluorescent glutathione detection based on lucigenin and MnO2 nanosheets	Mohamed Ibrahim Halawa, Fengxia Wu, Muhammad Nadeem Zafar, Islam M. Mostafa, Abubakar Abdussalam, Shuang Han, Guobao Xu	J. Mater. Chem. B. 2020, 8, 3542-3549	2020
66	Novel Synthesis of Thiolated Gold Nanoclusters Induced by Lanthanides for Ultrasensitive and Luminescent Detection of	Mohamed Ibrahim Halawa*, Bing Shi Li*, and Guobao Xu*.	ACS Appl. Mater. Interfaces 12, 29, 32888 – 32897	2020

	the Potential Anthrax Spores' Biomarker			
67	Highly sensitive and selective non-enzymatic glucose detection based on indigo carmine/hemin/H2O2 chemiluminescence	Tadesse Haile Fereja, Shimeles Addisu Kitte, Muhammad Nadeem Zafar, Mohamed Ibrahim Halawa, Shuang Han, Wei Zhang and Guobao Xu	Analyst 145, 1041-1046	2020
68	Silicotungstic acid as highly efficient coreactant of luminol chemiluminescence for sensitive detection of uric acid	Islam M. Mostafa, Mohamed Ibrahim Halawa, Yequan Chen, Abubakar Abdussalam, Yiran Guan and Guobao Xu	Analyst 145, 2709-2715	2020
69	Development of Ru(bpy)32+-amisulpride electrogenerated chemiluminescence system for ultrasensitive and selective detection of amisulpride in pharmaceuticals and real plasma	Mohamed Ibrahim Halawa*, Islam Mohamed Mostafa, Manar Mohamed Tolba, Yasser El-Shabrawy, Bing Shi Li*.	J. Electroanal. Chem. 864, 114059	2020
70	First-derivative synchronous spectrofluorimetric method for estimation of losartan potassium and atorvastatin in their pure forms and in tablets	Norhane Attaa Bakr, Samar Saad, Yasser Elshabrawy, Manal Eid	Luminescence 35, 561-571	2020
71	Graphene quantum dots as a nanoprobe for analysis of o- and p-nitrophenols in environmental water adopting conventional fluorometry and smartphone image processing-assisted paper-based analytical device. In-depth study of sensing mechanisms,	R. El-Shaheny, S. Yoshida, T. Fuchigami,	Microchem. J., 2020, 105241.	2020
72	Pentabromobenzyl-RP versus triazole-HILIC columns for separation of the polar basic analytes famotidine and famotidone: LC method development combined with in silico tools to follow the potential consequences of famotidine gastric instability,	R. El-Shaheny, M. O. Radwan, F. Belal, K. Yamada,	J. Pharm. Biomed. Anal., 186, 113305.	2020
73	Green conventional and first-order derivative fluorimetry methods for determination of trimebutine and its degradation product (eudesmic acid).	R. El-Shaheny, F. Belal,	Spectrochim. Acta A., 226, 117603.	2020

	Emphasis on the solvent and pH effects on their emission spectral properties,			
74	Rapid fluorometric determination of ticagrelor in tablets and rat plasma: Application to pharmacokinetics study	Heba Elmansi, Sahar Zayed, Fathalla Belal	Spectrochimica Acta Part A	2020
75	Investigation of micellar enhancement in simultaneous assay of rosuvastatin and amlodipine in their fixed-dose combined tablets	Fawzia Ibrahim, Heba Elmansi, Mohamed El-Awady, Samah AboEl Abass	Microchemical Journal	2020
76	Solvent-free mixed micellar mobile phases; an advanced green chemistry approach for reversed phase HPLC determination of some antihypertensive drugs	Adel Ehab Ibrahim, Heba Elmansi, Fathalla Belal	Journal of Separation Science.	2020
77	Preconcentration and detection of Gefitinib anti-cancer drug traces from water and human plasma samples by means of magnetic nanoparticles.	Hadeer Borg, Dániel Zámbó, Heba Elmansi, Heba M. Hashem, JennyJehan Nasr, Mohammed I. Walash, Nadja C. Bigall, Fathalla Belal	Nanomaterials 10(6), 1196	2020
78	Use of eosin for green spectroscopic determination of mebendazole	Aya Roshdy, Heba Elmansi, Shereen Shalan and Amina Elbrashy	Luminescence 35, 788 – 796.	2020
79	Utility of micellar liquid chromatography as an analytical tool for the estimation of three binary antibiotic mixtures. Application to biological fluids	Fawzia Ibrahim , Galal Magdy & Mary E. K. Wahba	Journal of Taibah University for Science. 14, 931–942	2020

The department's research plan

The department's research plan includes the following points:

1. Development of new analytical methods using high-efficiency equipment and techniques for raw materials and pharmaceutical preparations used in the treatment and control of endemic diseases.
2. Devising new analytical methods and studying the stability of pharmaceutical preparations and studying their efficiency in terms of physical and chemical properties for the preparations used in the treatment of hepatitis, heart diseases, and cholesterol-lowering.
3. Study and evaluation of metabolites in biological fluids for pharmaceutical preparations used in the treatment of diseases of the immune system, respiratory system, and central nervous system.

Trend	**The second trend** (from the research plan of the Faculty of Pharmacy- Mansoura University): - Introducing new methods of drug quality control
Aim	- Introducing new methods for analyzing drugs in the existing pharmaceuticals in the Egyptian drug market, with the separation and estimation of the degradation products of these drugs. -Analytical studies of drug stability - Analysis of drugs and their metabolites in biological fluids.
Responsible for implementation	-All staff members and staff assistants in the Department of Pharmaceutical Analytical Chemistry. - All researchers registered in master and doctoral programs in the Department of Pharmaceutical Analytical Chemistry.
Outputs	-Utility of advanced techniques for the determination of some compounds containing heterocyclic rings of pharmaceutical interest (Proposed PhD thesis). -Analytical study of certain nitrogenous compounds in pharmaceutical preparations (MSc thesis). -Determination of some drugs used in the management of viral disorders (MSc thesis). -New trends for analysis of certain drugs used for treatment of benign prostatic hyperplasia (MSc thesis). -Analytical studies for determination of antifungals in pharmaceutical formulations and biological fluids (MSc thesis). -Modern analytical methods for determination of some pharmaceutical drugs containing nitrogen and oxygen (MSc thesis).
Time frame	2020-2022
Success Indicators	-Scientific publishing -Patents -Human Resource Development (Researchers obtain master and doctorate degrees) -Create professional degrees -Concluding cooperation protocols with community organizations and institutions - Marketing of applied research
Funding Resources	-External missions and joint supervision -University research fund projects -Higher education and scientific research development projects and the STDF Academy of Scientific Research -Special Programs -Clinical pharmacy program -Pharm D . Program - Partnership projects with institutions such as the Serum and Vaccine Authority.

Trend	**The fourth trend** (from the research plan of the Faculty of Pharmacy - Mansoura University- :(Contribute to solving scientific and technical problems in the pharmaceutical industries
Aim	Constructive and fruitful cooperation with pharmaceutical companies to introduce and evaluate new developments in the field of pharmaceutical products
Responsible for implementation	-All staff members and staff assistants in the Department of Pharmaceutical Analytical Chemistry. - All researchers registered in master and doctoral programs in the Department of Pharmaceutical Analytical Chemistry.
Outputs	• Utility of advanced techniques for the determination of some compounds containing heterocyclic rings of pharmaceutical interest (Proposed PhD thesis). • Analytical study of certain nitrogenous compounds in pharmaceutical preparations (MSc thesis). • Determination of some drugs used in the management of viral disorders (MSc thesis). • New trends for analysis of certain drugs used for treatment of benign prostatic hyperplasia (MSc thesis). • Analytical studies for determination of antifungals in pharmaceutical formulations and biological fluids (MSc thesis). Modern analytical methods for determination of some pharmaceutical drugs containing nitrogen and oxygen (MSc thesis).
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