COURSE SPECIFICATIONS

Faculty of Pharmacy

Third Year – Second Term

2019-2020

CONTENTS:

COURSE SPECIFICATIONS

Sterile Products and Controlled Drug Delivery Systems

Third year – secondTerm
2019-2020

Course specification of Sterile Products and Controlled Drug Delivery Systems

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University: **Zagazig** **Faculty:** **Pharmacy**

A- Course specifications:

Program (s) on which the course is given: Bachelor of Pharmacy

Major or Minor element of programs: Major

Department offering the program: -------

Department offering the course: Pharmaceutics Department

Academic year Level: Third year/Second semester

Date of specification approval: 3 January 2020

B- Basic information:

Title: Sterile Products and Controlled Drug Delivery Systems Code: PC325

Credit Hours: ---

Lectures: 2hrs/week

Practical: 2hrs/week

Tutorials: ---

Total: 3hrs/week

C- Professional information:

1-Overall aim of the course

On completion of the course, the student will be able to illustrateParentral preparations (advantages, disadvantages, route of administration, incompatibilities, manufacturing processes of "ampoules-vials", sterilization, packaging, quality control), Ophthalmic preparations (solutions, suspensions, powders for reconstitution, ointment, ocusert, contact lenses, packaging, use), Pharmaceutical aerosols (advantages, components, preparation, aerosols, filling, packaging), Controlled release dosage forms for oral use (rational for extended release, controlled drug delivery systems: " coated beads, microencapsulation, complex formation, resinated drugs"), Colloidal drug delivery systems (liposomes, niosomes, nanoparticles).

2- Intended learning outcomes of Sterile Products and Controlled Drug Delivery Systems (ILOs)

A- Knowledge and Understanding	
a1	Describe formulation requirements and quality control tests of aerosols.
a2	illustrate the principles and properties of different controlled drug delivery systems as well as colloidal drug delivery systems
a3	Outline the requirements, formulation and quality control tests of parentrals and ophthalmic dosage forms
a4	Illustrate the basis of sterilization and packaging of parentrals and ophthalmic dosage forms
B- Professional and Practical skills	
b1	perform different calculations related to compounding of parentrals including isotonicity adjustment, milliequivalent, osmolarity and rate of flow of intravenous infusions
C- Intellectual skills	
c1	Select the appropriate drug delivery system according to drug properties and the intended site and rate of drug release
c2	Interpret results of quality control tests of parentrals and aerosols according to the pharmacopeial requirments
D- General and Transferable skills	
d1	Use information technology to collect and present data
d2	Develop critical thinking, decision-making and problem-solving skills.
d3	Work effectively as a member of a team

D- Contents:

Week No.	Lecture contents (2 hrs/week)	Practical session (2 hrs/week)
1	Pharmaceutical aerosols: - Advantages - components	Isotonic solutions
2	- Quality control of aerosols. - Filling of aerosols.	Problem solving
3	- Introduction to parentral preparations - Advantages & disadvantages of parenterals - Requirements for parenteral preparations - Routes of parenteral administration - Classification of parenteral preparations	Electrolyte solutions: Milliequivalents, Milimoles and Milliosmoles
4	- Sterilization techniques moist heat , dry heat, radiation, gas and filtration	Problem solving
5	Formulation of parentrals	Intravenous Infusions, Parenteral Admixtures, and Rate-of-Flow Calculations
6	- Packaging of parentrals. - Quality control tests of parentral preparations	Case study
7	Midterm exam	
8	Ophthalmic dosage forms	Parenteral admixtures
9	- Introduction to drug delivery systems - Advantages & disadvantages of delayed release dosage forms - Enteric coating - Colon specific drug delivery	Parenteral Nutrition

10	- Gastroretentive drug delivery systems - Diffusion based sustained release dosage forms - Bioerodible sustained release dosage forms - Osmotic pressure activated controlled drug delivery - Targeted release dosage forms	Case study
11	Colloidal drug delivery systems Liposomes	Revision evidence-based assignment
12	Colloidal drug delivery systems - Niosomes	**Delivery of assignment report**
13	Colloidal drug delivery systems - Microemulsion	**Practical exam**
14	- Revision&Open Discussion	
15	Final written exam	

E- Teaching and Learning Methods:

- Lectures
- Practical session (problem solving)
- Self learning (evidence based assignments about sterile marketed products containing different controlled delivery systems, case study)

F- Student Assessment methods:

1- Written exams to assess: a1, a2, a3, a4, c1

2- Activity to assess: d1, d2, d3

3- Practical exams to assess: a3, b1 , c2, d1, d2, d3

4- Oral exam to assess: a1, a2, a3, a4, c1

Assessment schedule

Assessment (1):midterm exam	Week 7
Assessment (2):final Written exam	Week 15
Assessment (3): Assignment report	Week 12
Assessment (4): Practical exam	Week 13
Assessment (5): Oral exams	Week 15

Weighting of Assessment

Assessment method	Marks	Percentage
Midterm exam	10	10%
Written exam	50	50%
Practical exam	20	20%
activity	5	5%
Oral exam	15	15%
TOTAL	100	100%

G- Facilities required for teaching and learning:

Black (white) boards, data show

H- List of References:

1- Course Notes: Student book of Sterile Products and Controlled Drug Delivery Systems approved by pharmaceutics department (2019/2020).

2- Essential Books:

- Pharmaceutical dosage forms: Parenteral medications vol. 1, 2nd edn, Dekker, 1992.
- Sterile Dosage Forms: Their preparation and clinical application. Ed., Salvatore Turco, Publisher:Lippincott Williams and Wilkins.
- Good pharmaceutical manufacture practice, rational and compliance, Jhon Sharp, CRC press

- Ansel's Pharmaceutical Dosage Forms and Drug Delivery System. Ed., Allen, Popovich and Ansel (2005). Publisher: Lippincott Williams and Wilkins.

3- Recommended Books:

- Martin's Physical Pharmacy and Pharmaceutical Sciences. Ed. Patrick J. Sinko (2006). Publisher: Lippincott Williams and Wilkins
- Pharmaceutics; the Science of Dosage Form Design. Ed., Michael E. Aulton (2006). Publisher: Thomson Learning.
- Remington; the Science and Practice of Pharmacy (21st edition). Publisher: Lippincott Williams and Wilkins.
- USP (797) Pharmaceutical Compounding—Sterile Preparations

4- Periodicals and websites:

- www.researchgate.net
- www.speciation.net
- www.ncbi.nlm.nih.gov
- http//www.lib.utexas.edu/etd/d/2003/codyk036/codyk036.pdf
- http://en.wikipedia.org/wiki/Code-switching

Course Coordinator: Dr. GehanFathyAttia

- **Head of Department: Prof. Nagia Ahmed El-Megrab**

Date: 2020م / 1 /3 تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ

Matrix I of Sterile Products and Controlled Drug Delivery Systems course

Course Contents		ILOs of Sterile Products and Controlled Drug Delivery Systems course									
		Knowledge and understanding				Professional and practical skills	Intellectual skills		Transferable and general skills		
Lectures		a1	a2	a3	a4	b1	c1	c2	d1	d2	d3
1	Pharmaceutical aerosols: - Advantages - components	x									
2	- Quality control of aerosols. - Filling of aerosols	x						x			
3	- Introduction to parentral preparations - Advantages & disadvantages of parenterals - Requirements for parenteral preparations - Routes of parenteral administration - Classification of parenteral preparations	X		x							
4	Sterilization techniques moist heat , dry heat, radiation, gas and filtration	x			x						
5	Formulation of parentrals	X		x							
6	- Packaging of parentrals. - Quality control tests of parentral preparations	X		x	x			x			
7	Ophthalmic dosage forms	X		x							
8	- Introduction to drug delivery systems - Advantages & disadvantages of delayed release dosage forms - Enteric coating - Colon specific drug delivery	X	x				x				
9	- Gastroretentive drug delivery systems - Diffusion based sustained release dosage forms	x	x				x				

	- Bioerodible sustained release dosage forms - Osmotic pressure activated controlled drug delivery - Targeted release dosage forms										
10	Colloidal drug delivery systems (Liposomes)	X	x				x				
11	Colloidal drug delivery systems (Niosomes)	X	x				x				
12	Colloidal drug delivery systems (microemulsion)	x	x				x				
Practical sessions											
1	Isotonic solutions					x				x	x
2	Problem solving					x				x	x
3	Electrolyte solutions: Milliequivalents, Milimoles and Milliosmoles					x				x	x
4	Problem solving					x				x	x
5	Intravenous Infusions, Parenteral Admixtures, and Rate-of-Flow Calculations					x				x	x
6	Case study					x		x	x	x	x
7	Parenteral admixtures					x				x	x
8	Parenteral Nutrition					x				x	x
9	Case study					x			x	x	x
10	evidence-based assignment						x		x	x	x

Matrix II of Sterile Products and Controlled Drug Delivery Systems course

National Academic Reference Standards (NARS)		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods			Method of assessment		
						Lecture	Practical session	Self learning	Written exam	Practical exam	Oral exam
2.1	Mention the principles of pharmaceutical sciences (Pharmacy orientation; medical terminology; physical pharmacy; pharmaceutics; industrial pharmacy; pharmaceutical technology; biopharmaceutics; pharmacokinetics; pharmaceutical chemistry; pharmacognosy; pharmaceutical microbiology; molecular biology and pharmaceutical biotechnology; quality assurance and quality control; instrumental analysis and biological drug assays).	A2	a1 a2 a3 a4	Pharmaceutical aerosols: - Advantages - components - Quality control of aerosols. - Filling of aerosols - Introduction to parentral preparations - Advantages & disadvantages of parenterals - Requirements for parenteral preparations - Routes of parenteral administration - Classification of parenteral preparations Sterilization techniques moist heat , dry heat, radiation, gas and filtration Formulation of parentrals - Packaging of parentrals. - Quality control tests of parentral preparations Ophthalmic dosage forms - Introduction to drug delivery systems	Student book Essential books	x			x		x

				- Advantages & disadvantages of delayed release dosage forms - Enteric coating - Colon specific drug delivery - Gastroretentive drug delivery systems - Diffusion based sustained release dosage forms - Bioerodible sustained release dosage forms - Osmotic pressure activated controlled drug delivery - Targeted release dosage forms Colloidal drug delivery systems (Liposomes) Colloidal drug delivery systems (Niosomes) Colloidal drug delivery systems (microemulsion)							
2.6	Properties of different pharmaceutical dosage forms including novel drug delivery systems.	A.16 A17	a1	Pharmaceutical aerosols (Advantages, components & preparation). Packaging of pharmaceutical aerosols Filling of aerosols.	Student book Essential books	x			x		x

			a2	Parentral preparations (Advantages, disadvantages, route of administration). Controlled drug delivery systems " coated beads, microencapsulation, complex formation, resinated drugs,…..etc"	Student book Essential books	x			x		x
				Ophthalmic preparations (Solutions, suspensions, powders for reconstitution, ointment, ocusert, contact lenses). Packaging and use of ophthalmic preparations	Student book Essential books	x			x		x
				Pharmaceutical aerosols (Advantages, components & preparation).	Student book Essential books	x			x		x
			a3	Controlled release dosage forms for oral use Rational for extended release	Student book Essential books	x			x		x
				Controlled drug delivery systems " coated beads, microencapsulation, complex formation, resinated drugs,…..etc"	Student book Essential books	x			x		x

2.10	Principles of public health issues including sources and control of microbial contamination as well as sanitation, disinfection, sterilization methods and microbiological QC of pharmaceutical products.	A.23	a4	Colloidal drug delivery systems (Liposomes, Niosomes and nanoparticles)	Student book Essential books	x			x		x
				Sterilization and packaging of parentral products. Manufacturing processes of (ampoules-vials).	Student book Essential books	x			x		x
				Packaging of pharmaceutical aerosols	Student book Essential books	x			x		x
	Exceeding NARs	B21	b1	Isotonic solutions	Practical notes		x			x	
				Electrolyte solutions: Milliequivalents, Milimoles and Milliosmoles			x			x	
				Intravenous Infusions, Parenteral Admixtures, and Rate-of-Flow Calculations			x			x	
				Parenteral admixtures			x			x	
				Parenteral Nutrition			x			x	
4.10	Apply pharmaceutical knowledge in the formulation of safe and effective medicines as well as in dealing with new drug delivery systems.	C.2	c1	- Introduction to drug delivery systems - Advantages & disadvantages of delayed release dosage forms - Enteric coating - Colon specific drug delivery	Student book Essential books	x			x		x
				- Gastroretentive drug delivery systems - Diffusion based sustained release							

4.13	Analyze and interpret experimental results as well as published literature.			dosage forms - Bioerodible sustained release dosage forms - Osmotic pressure activated controlled drug delivery - Targeted release dosage forms							
				Colloidal drug delivery systems (Liposomes)							
				Colloidal drug delivery systems (Niosomes)							
				Colloidal drug delivery systems (microemulsion)							
		C18	c2	Quality control of aerosols.		x			x		x
				Quality control tests of parentral preparations		x			x		x
5.3	Work effectively in a team	D3	d3	Isotonic solutions	Practical notes						
				Electrolyte solutions: Milliequivalents, Milimoles and Milliosmoles							
				Intravenous Infusions, Parenteral Admixtures, and Rate-of-Flow Calculations							
				Parenteral admixtures							
				Parenteral Nutrition							
5.4	Use numeracy, calculation and statistical methods as well as information technology tools	D.5	d1	Case study	Practical notes and Internet		x			x	
				evidence-based assignment							
5.10	Implement writing and	D.11	d2	Isotonic solutions	Practical		x			x	

	thinking, problem-solving and decision-making abilities.			Electrolyte solutions: Milliequivalents, Milimoles and Milliosmoles	notes						
				Intravenous Infusions, Parenteral Admixtures, and Rate-of-Flow Calculations							
				Parenteral admixtures							
				Parenteral Nutrition							

Course Coordinator: Dr. GehanFathyAttia

- **Head of Department: Prof. Nagia Ahmed El-Megrab**

Date: 2020 / 1 /3 تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ

COURSE SPECIFICATIONS

Phytochemistry-1

Third year – secondTerm
2019-2020

Course Specification of Phytochemistry I

University: **Zagazig** Faculty: **Pharmacy**

A- Course specifications:

Program(s) on which the course is given: Bachelor of Pharmacy

Major or Minor element of programs: Major

Department offering the program: ---------

Department offering the course: Pharmacognosy

Academic year/Level: Third year / semester 6

Date of specification approval: 30/09/2019

B- Basic information:

Title: Phytochemistry I Code: PG324

Credit Hours: ---

Lectures: 2 hrs

Practical: 2 hr

Tutorials: ---

Total: 3 hrs

C- Professional information:

1-Overall Aims of the Course:

On completion of the course, the student will be able to:
Demonstrate comprehensive knowledge, clear understanding and the competent skills in dealing with glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin combination and natural antioxidants.

2-Intended Learning Outcomes of Phytochemistry I

A- Knowledge and Understanding	
a1	Define, state and classify certain classes of natural products (glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin combination and natural antioxidants) and their physical properties.
a2	Describe the chemistry of the above mentioned classes, their pharmacological properties (biological activities) and contra-indications.
a3	Identify different analytical techniques used in natural products determination for the above mentioned classes, their methods of isolation, purification and identification.
a4	Identify natural and pharmaceutical products containing glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin combination and natural antioxidants.
B- Professional and Practical skills	
b1	Handle chemicals, solvents and equipment safely.
b2	Examine different glycosides, tannins, carbohydrates, resins and resin combination and natural antioxidants.
b3	Prepare lab research reports on glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin combination and natural antioxidants.
C- Intellectual skills	
c1	Choose the proper pharmaceutical terms and abbreviations for certain classes of natural (glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin combination and natural antioxidants).
c2	Estimate certain classes of naturally occurring products (glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin combination and natural antioxidants).
c3	Predict the appropriate method for isolation and purification of different glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin combination and natural antioxidants.
D- General and Transferable skills	
d1	Work effectively as a member of a team.
d2	Manage time to achieve targets within deadlines.
d3	Write and present reports.

d4	Develop critical thinking and problem-solving skills.

D- Contents:

Week No.	Lecture (2hrs/week)	Practical session (2hrs/week)
1	**Glycosides** Classification, isolation and properties	General properties of glycosides and extraction methods
2	**Glycosides** Phenolic glycosides, cyanogenic glycosides, thioglycosides	Chemical tests for cardiac glycosides, flavonoids and coumarins.
3	**Glycosides** Cardiac glycosides	(Activity) Get a copy of pamphlets for pharmaceutical products containing glycosides Application of chemical tests for glycosides in pharmaceutical products
4	**Glycosides** Flavonoids and coumarins	Chemical tests for anthraquinones and saponins.
5	**Glycosides** Anthraquinones, saponins and miscellaneous glycosides	Chemical tests for tannins and antioxidants.
6	**Tannins and antioxidants**	(Activity) Get a copy of pamphlets for pharmaceutical products containing glycosides, tannins and antioxidants Application of chemical tests for glycosides, tannins and antioxidants in pharmaceutical products
7	**Midterm written exam**	
8	**Carbohydrates** Definition, classification,	**Practical exam 1**

	properties, evaluation, drugs containing carbohydrates	
9	**Carbohydrates** Heteropolysaccharides and holopolysaccharides	General properties of carbohydrates Chemical tests for monosaccharides
10	**Bitter principals**	Chemical tests for disaccharides and polysaccharides
11	**Minerals**	Chemical tests for resins and resin combination (Activity) Get a copy of pamphlets for pharmaceutical products containing carbohydrates and resins and resin combination Application of chemical tests for carbohydrates and resins and resin combination in pharmaceutical products Lab research report on different studied classes in theoretical part
12	**Natural carotenoids**	**Practical exam 2**
13	**Resins and resin combination**	**Practical exam 3**
14	**Revision**.	
15	**Written exam**	

E- Teaching and Learning Methods:

- Lectures.

- Interactive lectures.
- Practical sessions.
- Videos.
- Self-learning (group discussion, net search).
- Visits to community pharmacy to get copy of pamphlets for pharmaceutical products containing studied natural products.

F- Student Assessment Methods:

1- Written exam (midterm, final) to assess a1, a2, a3, a4, c1, c2, c3 and d4.

2- Activity to assess b3, c1, c2, c3, d1, d2, d3 and d4.

3- Practical exam to assess b1, b2, b3.

4- Oral exam to assess a1, a2, a3, a4, c1, c2, c3 and d4.

Assessment schedule:

Assessment (1): Midterm written exam	Week 7
Assessment (2): Activity	Weeks 3, 6, 11
Assessment (3): Practical exam	Weeks 8, 12, 13
Assessment (4): Final written exam	Week 15
Assessment (5): Oral exams	Week 15

Weighting of Assessment:

Assessment method	Marks	Percentage
Midterm written exam	10	10%
Activity	5	5%
Practical exam	20	20%
Final written exam	50	50%
Oral exam	15	15%
TOTAL	100	100%

G- Facilities Required for Teaching and Learning:

- Black (white) board, Data show, Laboratory equipment (water bath, polarimeter, melting point apparatus, digital balances and glassware) and Chemicals.

H- List of References:

1- Course Notes:

Student book of Phytochemistry II approved by Pharmacognosy Department (2019).

2- Essential books:

Egbuna, C., Kumar, S., Ifemeje, J. C., & Kurhekar, J. V. (Eds.). (2018). *Phytochemistry: Volume 2: Pharmacognosy, Nanomedicine, and Contemporary Issues*. CRC Press.

Nakanishi, K., Goto, T., & Itô, S. (Eds.). (2013). *Natural products chemistry* (Vol. 1). Academic press.

Dewick, P. M. (2002). *Medicinal natural products: a biosynthetic approach*. John Wiley & Sons.

Colegate, S. M., & Molyneux, R. J. (Eds.). (2007). *Bioactive natural products: detection, isolation, and structural determination*. CRC press.

3- Recommended books:

Rahman, A. U. (2012). *Studies in natural products chemistry/edited by Atta-ur-Rahman*. Amsterdam; New York: Elsevier.

4- Periodicals and websites:

Fitoterapia**,** Die Pharmazie, Journal of Natural Products, Phytochemistry and Planta medica

http:// www.elsevier.com/phytochem

http:// www.elsevier.com/phytomed

http:// www.wiley.co.uk.

http:// www.sciencedirect.com

Course Coordinator: Prof Dr. Mahmoud AbdAlaal

Head of Department: Prof Dr. Amal Al-Gendy

Date: 2019/09/30 تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ

Matrix I of Phytochemistry I course

Course Contents		ILOs of Phytochemistry I course													
		Knowledge and understanding				Professional and practical skills			Intellectual skills			General and transferable skills			
Lectures		a1	a2	a3	a4	b1	b2	b3	c1	c2	c3	d1	d2	d3	d4
1	**Glycosides** Classification, isolation and properties	x							x		x				
2	**Glycosides** Phenolic glycosides, cyanogenic glycosides, thioglycosides		x	x	x				x	x	x				
3	**Glycosides** Cardiac glycosides		x	x	x				x	x	x				
4	**Glycosides** Flavonoids and coumarins		x	x	x				x	x	x				
5	**Glycosides** Anthraquinones, saponins and miscellaneous glycosides		x	x	x				X	x	x				
6	**Tannins and antioxidants**	x	x	x	x				x	x	x				
7	**Carbohydrates** Definition, classification, properties, evaluation, drugs containing carbohydrates	x	x	x	x				x	x	x				

8	**Carbohydrates** Heteropolysaccharides and holopolysaccharides		x	x	x				x	x	x				
9	**Bitter principals**	x	x	x	x				x	x	x				
10	**Minerals**	x	x	x	x				x	x	x				
11	**Natural carotenoids**	x	x	x	x				x	x	x				
12	**Resins and resin combination**	x	x	x	x				x	x	x				
Practical sessions															
13	General properties of glycosides and extraction methods					x		x			x			x	
14	Chemical tests for cardiac glycosides, flavonoids and coumarins.					x	x	x						x	
15	Glycosides in pharmaceutical products (activity).					x	x	x	x	x		x	x	x	x
16	Chemical tests for anthraquinones and saponins.					x	x	x						x	
17	Chemical tests for tannins and antioxidants.					x	x	x						x	
18	Glycosides, tannins and antioxidants in pharmaceutical products (activity).					x	x	x	x	x		x	x	x	x
19	General properties of carbohydrates Chemical tests for monosaccharides					x	x	x			x			x	
20	Chemical tests for disaccharides					x	x	x						x	
21	Chemical tests for polysaccharides					x	x	x						x	
22	Chemical tests for resins and resin combination Carbohydrates and resins and resin combination in pharmaceutical products					x	x	x	x	x		x	x	x	x

	Lab research report on different studied classes in theoretical part (activity).															

Matrix II of Phytochemistry I course

National Academic Reference Standards (NARS)		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods			Method of assessment			
						Lecture/ interactive lecture/ videos	Practical session/ videos	Self learning	Written exam	Practical exam	Oral exam	Activity
				Theoretical sessions								
2.4 **4.5**	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A12, C9**	**a1, c1, c3**	**Glycosides** Classification, isolation and properties	Student book Essential books	x			x		x	
2.13, **4.5**	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A30, C9**	**a2, a3, a4, c1, c2, c3**	**Glycosides** Phenolic glycosides, cyanogenic glycosides, thioglycosides	Student book Essential books Internet	x			x		x	
2.13, **4.5**	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A30, C9**	**a2, a3, a4, c1, c2,**	**Glycosides** Cardiac glycosides	Student book Essential books Internet	x			x		x	

			c3									
2.13, **4.5**	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A30, C9**	**a2, a3, a4, c1, c2, c3**	**Glycosides** Flavonoids and coumarins	Student book Essential books Internet	x			x		x	
2.13, **4.5**	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A30, C9**	**a2, a3, a4, c1, c2, c3**	**Glycosides** Anthraquinones, saponins and miscellaneous glycosides	Student book Essential books Internet	x			x		x	
2.4 **2.13,** **4.5**	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds. Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A12, A30, C9**	**a1, a2, a3, a4, c1, c2, c3**	**Tannins and antioxidants**	Student book Essential books Internet	x			x		x	
2.4 **2.13,** **4.5**	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds. Pharmacological properties of drugs	**A12, A30, C9**	**a1, a2, a3,**	**Carbohydrates** Definition, classification, properties, evaluation,	Student book Essential books	x			x		x	

	including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.		**a4, c1, c2, c3**	drugs containing carbohydrates	Internet							
2.13, 4.5	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A30, C9**	**a2, a3, a4, c1, c2, c3**	**Carbohydrates** Heteropolysaccharides and holopolysaccharides	Student book Essential books Internet	x			x		x	
2.4 2.13, 4.5	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds. Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A12, A30, C9**	**a1, a2, a3, a4, c1, c2, c3**	**Bitter principals**	Student book Essential books Internet	x			x		x	
2.4 2.13, 4.5	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds. Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A12, A30, C9**	**a1, a2, a3, a4, c1, c2, c3**	**Minerals**	Student book Essential books Internet	x			x		x	
2.4	Principles of isolation, synthesis, purification, identification, and	**A12,**	**a1,**	**Natural carotenoids**	Student book	x			x		x	

2.13, **4.5**	standardization methods of pharmaceutical compounds. Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A30, C9**	**a2, a3, a4, c1, c2, c3**		Essentia l books Internet							
2.4 **2.13,** **4.5**	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds. Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	**A12, A30, C9**	**a1, a2, a3, a4, c1, c2, c3**	**Resins and resin combination**	Internet	x			x		x	
				Practical sessions								
3.2 3.11, 4.5 5.9,	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Conduct research studies and analyze the results Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins. Implement writing and presentation skills.	B2, B19, C9, D10	**b1, b3, c3, d3**	General properties of glycosides and extraction methods	Practica l notes		x			x		
3.2 3.4, 3.11,	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the	B2, B6, B19, D10	**b1, b2, b3, d3**	Chemical tests for cardiac glycosides, flavonoids and coumarins.	Practica l notes		x			x		

5.9,	results Implement writing and presentation skills.											
3.2 3.4, 3.11, 4.2, 4.5, 5.2, 5.3, 5.4, 5.9, 5.10	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the results Comprehend and apply GLP, GPMP, GSP and GCP guidelines in pharmacy practice. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins. Retrieve and evaluate information from different sources to improve professional competencies. Work effectively in a team. Use numeracy, calculation and statistical methods as well as information technology tools. Implement writing and presentation skills. Implement writing and thinking, problem-solving and decision- making abilities.	B2, B6, B19, C3, C9, D2, D3, D4, D10, D11	**b1, b2, b3, c1, c2, d1, d2, d3, d4**	(Activity) pharmaceutical products	Practical notes Internet Visits for community pharmacies		x	x		x		x
3.2 3.4, 3.11, 5.9,	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the results Implement writing and presentation skills.	B2, B6, B19, D10	**b1, b2, b3, d3**	Chemical tests for anthraquinones and saponins.	Practical notes		x			x		

3.2 3.4, 3.11, 5.9,	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the results Implement writing and presentation skills.	B2, B6, B19, D10	**b1, b2, b3, d3**	Chemical tests for tannins and antioxidants.	Practical notes		x			x		
3.2 3.4, 3.11, 4.2, 4.5, 5.2, 5.3, 5.4, 5.9, 5.10	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the results Comprehend and apply GLP, GPMP, GSP and GCP guidelines in pharmacy practice. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins. Retrieve and evaluate information from different sources to improve professional competencies. Work effectively in a team. Use numeracy, calculation and statistical methods as well as information technology tools. Implement writing and presentation skills. Implement writing and thinking, problem-solving and decision- making abilities.	B2, B6, B19, C3, C9, D2, D3, D4, D10, D11	**b1, b2, b3, c1, c2, d1, d2, d3, d4**	(Activity) pharmaceutical products	Practical notes Internet Visits for community pharmacies		x	x		x		x
3.2 3.4, 3.11, 4.5 5.9,	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the results Select the appropriate methods of isolation, synthesis, purification,	B2, B6, B19, C9, D10	**b1, b2, b3, c3, d3**	General properties of carbohydrates Chemical tests for monosaccharides	Practical notes		x			x		

	identification, and standardization of active substances from different origins. Implement writing and presentation skills.											
3.2 3.4, 3.11, 5.9,	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the results Implement writing and presentation skills.	B2, B6, B19, D10	**b1, b2, b3, d3**	Chemical tests for disaccharides and polysaccharides	Practical notes		x			x		

3.2 3.4, 3.11, 4.2, 4.5, 5.2, 5.3, 5.4, 5.9, 5.10	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations. Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins. Conduct research studies and analyze the results Comprehend and apply GLP, GPMP, GSP and GCP guidelines in pharmacy practice. Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins. Retrieve and evaluate information from different sources to improve professional competencies. Work effectively in a team. Use numeracy, calculation and statistical methods as well as information technology tools. Implement writing and presentation skills. Implement writing and thinking, problem-solving and decision- making abilities.	B2, B6, B19, C3, C9, D2, D3, D4, D10, D11	**b1,** **b2,** **b3,** **c1,** **c2,** **d1,** **d2,** **d3,** **d4**	Chemical tests for resins and resin combination (Activity) pharmaceutical products Lab research report on different studied classes in theoretical part	Internet Visits for community pharmacies		x	x		x		x

Course Coordinator: Prof Dr. Mahmoud AbdAlaal

Head of Department: Prof Dr. Amal Al-Gendy

Date: 2019/09/30 تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ

COURSE SPECIFICATIONS

Pharmacology -2

Third year – secondTerm 2019-2020

Course Specificationof Pharmacology -II

University: **Zagazig** **Faculty:** **Pharmacy**

A- Course specifications:

Program(s) on which the course is given: **Bachelor of Pharmacy**

Major or Minor element of programs: Major

Department offering the program: ------

Department offering the course: **Pharmacology and toxicology department**

Academic year / Level: **Third year / Second term**

Date of specification approval: February 2020

B- Basic information:

Title: Pharmacology II Code: **PT323**

Credit Hours: ------

Lectures: 2hrs/week

Practical: 2hrs/week

Tutorials: ---

Total: 3hrs/week

C- Professional information:

1-Overall Aims of the Course

On completion of the course, students will be able to:

- Explain body functions as well as clinical features of different diseases that were not covered in Pharmacology (1) to determine appropriate pharmacological therapy.
- Build up comprehensive knowledge about essential bases of pharmacology and how to apply these bases in their professional life as pharmacists in community.

2-Intended Learning Outcomes of (ILOS)

A- Knowledge and Understanding	
a1	Illustrate disorders in body functions associated with various disease states.
a2	Demonstrate etiology, epidemiology and clinical features of different diseases.
a3	Describe pharmacological properties of drugs.
B- Professional and Practical Skills	
b1	Apply lab safety measures.
b2	Practice the basics handling of experimental animals & routes of drugs administration.
b3	Perform in vivo experiments to determine pharmacological properties of drugs in a professional manner.
C- Intellectual Skills	
c1	Select the proper drug in various disease conditions based on drug-related information.
c2	Assess information from different sources in the field of pharmacology.
D- General and Transferable Skills	
d1	Work effectively as a member of a team.
d2	Develop calculation skills
d3	Present information as a written report

D- Contents:

Week No.	Lecture (2hrs/week)	Practical Session (2hrs/week)
1	• Degenerative disorders and spasticity.	• Lab safety measures • Handling of experimental animals and routes of drugs administration (mice) (1)
2	• Drugs used for treatment of anxiety and sleep disorders. • Treatment of depression and mania. • Drugs used for treatment of mania and bipolar disorder	• Lab safety measures • Handling of experimental animals and routes of drugs administration (mice) (2)
3	• Drugs used for treatment of psychosis and anxiety.	• Handling of experimental animals and routes of drugs administration (frogs) (1)
4	• Antiepileptic drugs.	• Handling of experimental animals and routes of drugs administration (frogs) (2)
5	• Pain control with general and local anaesthetics.	• CNS stimulants (1)
6	• Central nervous system stimulants.	• CNS stimulants (2)
7	• Mid-term	
8	• Anti hyperlipidemic drugs	• CNS depressants (1)
9	• Drugs used in coagulation and bleeding disorders.	• CNS depressants (2)
10	• Autacoids	• Analgesics (1) • Activity (reports)
11	• Anti-inflammatory, antipyretic and analgesic agents.	• Analgesics (2) • Activity (reports)
12	• Respiratory system pharmacology.	• Practical exam
13	• Gastrointestinal pharmacology.	• Practical exam
14	• Drugs used for treatment of anemia • Hematopoietic growth factors.	
15	• Final written exam	

E- Teaching and Learning Methods:

- Lectures
- Practical sessions
- Open discussion, self-learning.

F- Student Assessment Methods:

1- Written exam (midterm and final) to assess: a1, a2, a3, c1, c2

2- Activity (report) to assess d1, d3

3- Practical exam to assess: b1, b2, b3, d1, d2, d3

4- Oral exam to assess: a1, a2, a3, c1, c2

Assessment Schedule:

Assessment (1): Final written exam	Week 15
Assessment (2): Practical exam	Weeks12, 13
Assessment (3): Oral exam	Week 15
Assessment (4): Midterm exam	Week 7
Assessment (5): Activity (report)	Weeks 10,11

Weighting of Assessment:

Assessment method	Marks	Percentage
Midterm exam	**10**	**10%**
Final written exam	**50**	**50%**
Activity (Report)	**5**	**5%**
Practical exam	**20**	**20%**
Oral exam	**15**	**15%**
TOTAL	**100**	**100%**

F- Facilities required for teaching and learning:

- Black (white) board, Data show, Laboratory equipment, laboratory animals and Chemicals.

H- List of References:

1- Course Notes: Student book of Pharmacology (2) approved by the Pharmacology and toxicology department (2019)

- Practical notes of Pharmacology (2) approved by the Pharmacology and

toxicology department (2019)

2- Essential Books:

i- Rang &Dale pharmacology (eighth edition); Churchil Livingstone (2015).

ii- Katzung basic and clinical pharmacology (fourteenth edition); Mc Graw Hill Lang. (2017).

3- **Recommended Books**

i- Lippincott illustrated reviews-pharmacology (seventh edition) (2018).
ii- Tripathi Essentials of Medical Pharmacology (eighth edition) (2018)

4- Periodicals and websites:

- Aquilina A. The extemporaneous compounding of paediatric medicines at Mater Dei Hospital. Journal of the Malta College of Pharmacy Practice.Issue 19, 28 – 30, 2013.

http://canadianpharmacistsletter.therapeuticresearch.com/ce/ceCourse.asp

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Course Coordinator: Prof. Dr. Atef Saad

Head of Department: Prof. Dr. Mona Fouad Mahmoud

Date:2020 تم مناقشة واعتماد توصيف المقرر من مجلس القسم بتاريخ فبراير

Matrix I

Course Contents		ILOs of the course										
		Knowledge and understanding			Practical skills			Intellectual skills		General and transferable and skills		
		a1	a2	a3	b1	b2	b3	c1	c2	d1	d2	d3
Lectures												
1	Degenerative disorders and spasticity.	x	x	x				x	x			
2	Drugs used for treatment of anxiety and sleep disorders. Treatment of depression and mania. Drugs used for treatment of mania and bipolar disorder	X	x	x				x	x			
3	Drugs used for treatment of psychosis and anxiety.	X	x	x				x	x			
4	Antiepileptic drugs.	X	x	x				x	x			
5	Pain control with general and local anaesthetics.	X	x	x				x	x			
6	Central nervous system stimulants.	X	x	x				x	x			
7	Mid-term	X	x	x				x	x			
8	Anti hyperlipidemic drugs	X	x	x				x	x			
9	Drugs used in coagulation and bleeding disorders.	X	x	x				x	x			

10	Autacoids	X	x	x				x	x			
11	Anti-inflammatory, antipyretic and analgesic agents.	X	x	x				x	x			
12	Respiratory system pharmacology.	X	x	x				x	x			
13	Gastrointestinal pharmacology.	X	x	x				x	x			
14	Drugs used for treatment of anemia Hematopoietic growth factors.	X	x	x				x	x			
15	Revision and open discussion	X	x	x				x	x			
Practical sessions												
1	- Lab safety measures - Handling of experimental animals and routes of drugs administration (mice) (1)				x	x	x				x	
2	- Lab safety measures - Handling of experimental animals and routes of drugs administration (mice) (2)				x	x	x				x	
3	- Handling of experimental animals and routes of drugs administration (frogs) (1)				x	x	x				x	
4	- Handling of experimental animals and routes of drugs administration (frogs) (2)				x	x	x				x	

5	- CNS stimulants (1)				x	x	x				x	
6	- CNS stimulants (2)				x	x	x				x	
7	- CNS depressants (1)				x	x	x				x	
8	- CNS depressants (2)				x	x	x				x	
9	- Analgesics (1) - Activity (reports)				x	x	x			x	x	x
10	- Analgesics (2) - Activity (reports)				x	x	x			x	x	x
11	- Practical exam				x	x	x			x	x	x

Matrix II of Pharmacology II course

National Academic Reference Standards (NARS)		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods			Method of assessment			
						Lecture	Practical session	Self-learning	Written exam	Practical exam	Midterm exam	Oral exam
2.12	Etiology, epidemiology, laboratory diagnosis and clinical features of different diseases and their pharmacotherapeutic approaches.	A27	a1 a2	All topics	Student book, Essential books	x			x		x	x
		A29	a3									
2.13	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions.	A30	a3	All topics	Student book Essential books	x			x		x	x
	Exceeding NARS	B3	b1 b2	Laboratory safety measures	Practical notes		x			x		

3.4	Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins.	B6	b3	All topics	Practical notes		x			x		
4.9	Utilize the pharmacological basis of therapeutics in the proper selection and use of drugs in various disease conditions.	C14	c1	All topics	Student book Essential books	x			x			x
4.13	Analyze and interpret experimental results as well as published literature	C18	c2	All topics	Student book Essential books	x			x			x
5.3	Work effectively in a team	D3	d1	Activity and practical session	Practical notes Recommended books Internet		X	x		x		
5.4	Use numeracy, calculation and statistical methods as well as information technology tools.	D4	d2	Practical session	Practical notes Recommended books Internet			x		X		
5.9	Implement writing and presentation skills.	D10	d3	Activity	Recommended books Internet			x		x		

Course Coordinator: **Prof. Dr. Atef Saad**

Head of Department: **Prof. Dr. Mona Fouad Mahmoud**

Date: **تم مناقشة واعتماد توصيف المقرر من مجلس القسم بتاريخ فبراير 2020**

COURSE SPECIFICATIONS

Biochemistry -2

Third year – secondTerm
2019-2020

Course Specification of Biochemistry (2)

University: **Zagazig** **Faculty:** **Pharmacy**

A- Course specifications:

Program(s) on which the course is given: Bachelor of Pharmacy

Major or Minor element of programs: Major

Department offering the program: -------

Department offering the course: Biochemistry Department

Academic year/ Level: 2019/2020 Third year /second term

Date of specification approval: /9/2019

B- Basic information:

Title: Biochemistry (2) Code: BC321

Credit Hours: ---

Lectures: 3 hrs/week

Practical: 2 hrs/week

Tutorials: ---

Total: 4 hrs/week

C- Professional information:

1-Overall Aims of the Course:

On completion of the course, students will be able to:

- Illustrate the different metabolic pathways of carbohydrates, lipids, proteins and integration of metabolism.
- Analyze and interpret experimental results.

2-Intended Learning Outcomes of Biochemistry (2) (lLOs):

A- Knowledge and Understanding	
a1	Outline the principles of food staff, absorption and digestion.
a2	Illustrate different metabolic pathways of carbohydrates, lipids and proteins.
a3	Discuss regulatory factors affecting different metabolic pathways.
B- Professional and Practical skills	
b1	Handle biological samples safely.
b2	Perform laboratory tests for biological samples to detect different types of lipids and metabolites.
b3	Interpret laboratory results in suitable form.
C- Intellectual skills	
c1	Apply different biological methods used to assay different metabolites and biological samples.
c2	Correlate between different metabolic pathways
D- General and Transferable skills	
d1	Work effectively as a member of a team.
d2	Write and present reports effectively.
d3	Develop self-learning skills.

D-Contents:

Week No.	Lecture (3 hrs/ week)	Practical session (2 hr/week)
1	- Carbohydrates digestion and absorption - Metabolism of mono and disaccharides - Glycolysis (Reactions, steps and regulation)	- Laboratory safety measures
2	- Gluconeogenesis (Reactions and regulation) - Tricarboxylic acid cycle (Reactions, regulation and calculation of energy produced)	-Lipid metabolism -Lipid profile -Determination of triglycerides
3	- HMP shunt (Reactions and functions) - Uronic acid pathway (Reactions)	-Determination of cholesterol
4	- Glycogen metabolism - Glycogenesis regulation - Glycogenolysis regulation	-Methods of determination of HDL-c and LDL-c
5	- Digestion and absorption of lipids Plasma lipids - Oxidation of fatty acids	-Lipid metabolism abnormalities case.
6	- Lipogenesis - Lipolysis in adipose tissues. - Phospholipid metabolism	-Protein metabolism. -Determination of serum urea level.
7	Midterm exam	
8	- Ketone bodies metabolism - **Self-learning activities (Diabetes – glycogen storage disease)**	-Determination of serum uric acid level.
9	- Cholesterol metabolism - Lipoproteins metabolism - **Self-learning activities (fatty liver)**	-Protein metabolism abnormalities case.
10	- Protein turnover - Digestion and absorption of dietary proteins. - Nitrogen metabolism - Transamination	- Revision / Quiz
11	- Deamination -Transdeamination - Metabolism of ammonia - Urea cycle **- Self-learning activities (Growth**	- Activity presentation.

	formula, benefits and hazards)	
12	- Conversion of amino acids to specialized products	-Practical exam
13	- Conversion of amino acids to specialized products (continue) - Metabolic correlation associated with some diseases	
14	- Revision	
15	-Final exam	

E- Teaching and Learning Methods:

- Interactive lectures
- Practical sessions
- Case study
- Self-learning (activity: reports and presentations)

F- Student Assessment Methods:

1- Written exam	to assess	a1, a2, a3, c2
2- Practical exams	to assess	b1, b2, b3, c1
3- Activities	to assess	d1, d2, d3
4- Oral exam	to assess	a1, a2, a3, c2
5- Midterm exam	to assess	a1, a2, a3, c2

Assessment schedule:

Assessment (1): Written exam	Week 15
Assessment (2): Activity	Week 8,9,11
Assessment (3): Practical exams	Week 12
Assessment (4): Oral exams	Week 15
Assessment (5): Midterm exam	Week 7

Weighting of Assessment:

Assessment method	Marks	Percentage
Written exam	75	50%
Midterm exam	15	10%
Activity	10	7 %
Practical exam	30	20%
Oral exam	20	13%
TOTAL	150	100%

G- Facilities Required for Teaching and Learning:

- Black/white board, screens, Laboratory equipment (glassware, spectrophotometer, centrifuge, digital balances) and Chemicals.

H- List of References:

1- Course Notes:

- Student book of Biochemistry (2) approved by biochemistry department 2019.
- Practical notes of Biochemistry (2) approved by biochemistry department 2019.

2- Essential books:

- Marks' basic medical biochemistry: a clinical approach (fifth edition); Lieberman M., Marks A.D., Peet MD, Alisa. (2017).
- Lehninger principles of biochemistry (seventh edition); Nelson D.L.; Cox M.M. (2017).
- Basic concepts in biochemistry; Gilbert H.F.; The Mc Graw Hill companies Inc. (2000).
- Lippincott’s Illustrated Reviews: Biochemistry (Seventh edition) ; Ferrier D.R. (2017)

3- Recommended books:

- Biochemistry (sixth edition); Garrett R.H. and Grisham C.M.; Thomson learning, Inc (2016).
- Harper's Illustrated Biochemistry (31st edition); Rodwell V.W., Bender D., Botham K.M., Kennelly P.J., Weil P. A. (2018).
- Clinical Biochemistry made ridiculously simple (third edition); Stephen Goldberg. M.D.; Med Master Inc. (2010).

4- Periodicals and websites:

- Egyptian J. of biochem. and molecular biology.
- Egyptian J. of Pharmaceutical sciences.
- Arab J. of Laboratory Medicine.
- www.Pubmed.Com
- www.sciencedirect.com

Course Coordinator: Prof. Dr. Sahar Elswefy

Head of Department: Prof. Dr. Sahar Elswefy

Matrix I of Biochemistry-2 course

Course Contents		ILOs of Biochemistry-2 course										
		Knowledge and understanding			Professional and practical skills			Intellectual skills		General and transferable skills		
Lectures		a1	a2	a3	b1	b2	b3	c1	c2	d1	d2	d3
1	- Carbohydrates digestion and absorption - Metabolism of mono and disaccharides - Glycolysis (Reactions, steps and regulation)	x	x	x					x			
2	- Gluconeogenesis (Reactions and regulation) - Tricarboxylic acid cycle (Reactions, regulation and calculation of energy produced)		x	x					x			
3	- HMP shunt (Reactions and functions) - Uronic acid pathway (Reactions)		x						x			
4	- Glycogen metabolism - Glycogenesis regulation - Glycogenolysis regulation		x	x					x			
5	- Digestion and absorption of lipids Plasma lipids - Oxidation of fatty acids	x	x									
6	-Midterm exam	x	x	x					x			
7	- Lipogenesis - Lipolysis in adipose tissues. - Phospholipid metabolism		x						x			
8	- Ketone bodies metabolism - Self-learning activities (Diabetes – Glycogen storage diseases)		x							x	x	x
9	-Lipoproteins metabolism - Cholesterol metabolism - Self-learning activities (fatty liver)		x					x		x	x	x

10	- Protein turnover - Digestion and absorption of dietary proteins. - Nitrogen metabolism - Transamination	x	x								
11	- Deamination -Transdeamination - Metabolism of ammonia - Urea cycle - Self-learning activities (Growth formula, benefits and hazards)		x					x	x	x	x
12	- Conversion of amino acids to specialized products							x			
13	- Conversion of amino acids to specialized products (continue) - Metabolic correlation associated with some diseases							x			
14	-Revision	x	x	x			x	x			
15	-Final exam	x	x	x				x			
Practical sessions											
1	- Laboratory safety measures				x						
2	-Lipid metabolism -Lipid profile -Determination of triglycerides				x	x	x				
3	-Determination of cholesterol				x	x	x				
4	-Methods of determination of HDL-c and LDL-c				x	x	x				
5	-Lipid metabolism abnormalities case.					x	x				
6	-Midterm exam	x	x	x				x			
7	-Protein metabolism. -Determination of serum urea level.				x	x	x				
8	-Determination of serum uric acid level.				x	x	x				
9	-Protein metabolism abnormalities case.					x	x				
10	- Revision / Quiz					x	x				
11									x	x	x

	-Activity presentation										
12	-Practical exam				x x	x	x				

Matrix II of Biochemistry-2 course

National Academic Reference Standards NARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods			Weighting of assessment			
						Lecture	Practical session	Self learning	Written exam	Practical exam	Oral exam	Periodical exam
2.1	Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice.	A4	a1	- Carbohydrates digestion and absorption - Metabolism of mono and disaccharides - Glycolysis (Reactions, steps and regulation)	Student book Essential books	x			x		X	X
				- Digestion and absorption of lipids Plasma lipids - Fat oxidation of fatty acids	Student book Essential books	x			x		X	X
				- Protein turnover - Digestion and absorption of dietary proteins. - Self-learning activities	Student book Essential books	x			x		X	
				Revision	Student book Essential books	x			x		x	

2.11	Principles of body function in health and disease states as well as basis of genomic and different biochemical pathways regarding their correlation with different diseases.	A25	a2	- Carbohydrates digestion and absorption - Metabolism of mono and disaccharides - Glycolysis (Reactions, steps and regulation)	Student book Essential books	x			x		X	X
				- Gluconeogenesis (Reactions and regulation) - Tricarboxylic acid cycle (Reactions, regulation and calculation of energy produced)	Student book Essential books	x			x		X	X
				- HMP shunt (Reactions and functions) - Uronic acid pathway (Reactions)	Student book Essential books Recommended books Internet	x		x	x		X	X
				- Glycogen metabolism (Structure and functions) - Glycogenesis regulation - Glycogenolysis regulation	notebook	x			x		X	X
			a3	- Digestion and absorption of lipids Plasma lipids - Fat oxidation	Student book Essential books	x			x		X	X

				of fatty acids								
				- Lipogenesis - Lipolysis in adipose tissues. - Phospholipid metabolism	Student book Essential books	x			x		X	X
				- Ketone bodies metabolism - Self-learning activities - Periodical exam	Student book Essential books	x			x		X	
				- Cholesterol metabolism and lipoproteins	Student book Essential books	x			x		X	
				- Protein turnover - Digestion and absorption of dietary proteins. - Self-learning activities	Student book Essential books	x			x		X	
				- Nitrogen metabolism - Transamination - Deamination - Trasdeamination	Student book Essential books Recommended books Internet	x		x	x		X	
				- Metabolism of ammonia - Urea cycle - Self learning activities	Student book Essential books	x			x		X	

				- Conversion of amino acids to specialized products	Student book Essential books	x			x		X	
		A25		- Conversion of amino acids to specialized products (continue)	Student book Essential books	x			x		X	
				- Ketone bodies metabolism - Self-learning activities - Periodical exam	Student book Essential books	x			x		X	
				- Cholesterol metabolism and lipoproteins	Student book Essential books	x			x		X	
				- Metabolic correlation associated with some diseases	Student book Essential books	x			x		X	

3.2	Handle and dispose chemicals and pharmaceutical preparations safely.	B2	b1	-Laboratory safety measures -lipid profile determination (triacylglycerol determination) - lipid profile determination (total cholesterol determination) - lipid profile determination (HDL-c and LDL-c determination) - Case study related to lipid metabolism abnormalities -Activity (Report and presentations) - Determination of urea - determination of creatinine- - Case study related to protein metabolism abnormalities	Practical notes		x			x		

3.6	Monitor and control microbial growth and carry out laboratory tests for identification of infectious and non-infectious diseases in biological specimens	B11	b2, b3	-Laboratory safety measures -lipid profile determination (triacylglycerol determination) - lipid profile determination (total cholesterol determination) - lipid profile determination (HDL-c and LDL-c determination) - Case study related to lipid metabolism abnormalities -Activity (Report and presentations) - Determination of urea - determination of creatinine- - Case study related to protein metabolism abnormalities	Practical notes		x			x		
4.13	Analyze and interpret experimental results as well as published literature	C18	c1, c2	- Glycogen metabolism (Structure and functions) - Glycogenesis regulation - Glycogenolysis regulation- - Digestion and	Student book Essential books	x			x		x	

				absorption of lipids Plasma lipids - Fat oxidation of fatty acids- -								
5.3	Work effectively in a team	D3	d1	Activity (report and presentations)	Recommended books Internet			x		x		
5.5	Practice independent learning needed for continuous professional development.	D6	d3	Activity (report and presentations)	Recommended books Internet			x		x		
5.9	Implement writing and presentation skills	D10	d2	Activity (report and presentations)	Recommended books Internet			x		x		

COURSE SPECIFICATIONS

Parasitology and Pathology

Third year – secondTerm 2019-2020

Course Specification of Parasitology and Pathology

University: Zagazig Faculty: Pharmacy

A- Course specifications:

Programme(s) on which the course is given: Bachelor of Pharmacy

Major or Minor element of programmes: Major

Department offering the program: -------

Department offering the course: Microbiology Department

Academic year/level: third year/ Second term

Date of specification approval: September 2019

B- Basic information:

Title: Parasitology and Pathology Code: **MI322**

Credit Hours: ---

Lectures: 2 hrs/week

Practical: 1 hr/week

Tutorials: ---

Total: 2.5 hrs/week

C- Professional information:

1-Overall Aims of the Course:

On completion of the course, students will be able to:

Underline the basic concepts of parasitology, entomology and pathology. Examine of different parasites as well as different pathological diseases under microscope. Specify the appropriate methods for treatment, prevention and control of different diseases caused by parasites and insects. Develop critical thinking and effective communication skills with patients and other health care professionals.

2-Intended Learning Outcomes of Parasitology and Pathology Course (lLOs):

A- Knowledge and Understanding	
a1	Illustrate the basic concepts of parasitology.
a2	Summarize the principles of entomology and diseases caused by insects.
a3	Identify the basic fundamentals of pathology.
a4	Recognize etiology, epidemiology and clinical features of different diseases caused by parasites and insects.
a5	Determine the etiology of disease and response of cells to various injurious agents.
a6	Outline the laboratory diagnosis of diseases caused by different parasites.
B- Professional and Practical skills	
b1	Use the proper terms of parasitology, entomology and pathology.
b2	Select drugs for treatment of different diseases caused by parasites.
b3	Perform microscopical examination of different parasitic stages and insects from different specimens.
b4	Identify pathological slides for different diseases.
C- Intellectual skills	
c1	Suggest the appropriate methods for treatment, prevention and control of different parasites and insects.
c2	Analyze and interpret experimental results for identification of parasites, insects and pathological diseases in suitable form.
D- General and Transferable skills	
d1	Communicate efficiently in oral and written manner.
d 2	Develop internet search and computer skills.
d 3	Demonstrate critical thinking, decision-making and problem-solving in dealing with case study.

D- Contents:

Week No.	Lectures (2 hrs/week)	Practical session (1hr/week)
1	- General Introduction	- General Introduction – General terms of parasitology
2	- Helminthology 2a-Trematodes: - General characters - Fasciola species - Short essay questions	- Parasitological laboratory examination: - Sample collection - Evaluation of different techniques used in the diagnosis of parasitic infections: - Microscopical - Serology - Modern molecular techniques (e.g. PCR)
3	- Heterophyes species - Schistosoma species - Case report	- Demonstration of microscopic slides of morphologic stages of: - Fasciola species - Heterophyes species - Schistosoma species - Demonstration of Snails hosts
4	Cestodes: - General characters - Taenia saginata - Taenia solium - Cysticercosis Case report	- Demonstration of microscopic slides of morphologic stages of: Taenia saginata Taenia solium
5	- Echinococcus sp. - Hymenolepis sp. - Diphyllobothrium sp. Nematodes:` - General characters - Ascaris lumbricoides - Hook worm sp.	Demonstration of microscopic slides of morphologic stages of : - Echinococcus sp. - Ascaris lumbricoides - Hook worm sp. - **Activity (poster preparation)**
6	- Enterobius & Trichuris - Trichinella spiralis - Wuchereria species - Case report	Demonstration of microscopic slides of morphologic stages of: - Enterobius & Trichuris - Trichinella spiralis - Wuchereria species
7	Midterm exam	
8	Protozoology - Amoebae species - Balantidium coli	Demonstration of microscopic slides of morphologic stages of: - Amoebae species

	- Giardia lamblia - Trichomonas vaginalis - Case report	- Balantidium coli - Giardia lamblia - Trichomonas vaginalis
9	- Leishmania species - Trypanosoma species. Case report	- Leishmania species - Trypanosoma species.
10	- Plasmodium species - Toxoplasma gondii Case study	- Plasmodium species - Toxoplasma gondii - Lab. Diagnosis of parasitic infections
11	Entomology - General characters - Mosquito species - Lice, Fleas, Bugs - Ticks, Mites & Cyclops Parasitic Infections: Clinical Manifestations, Diagnosis and Treatment	Demonstration of microscopic slides of: - Mosquito species - Lice, Fleas, Bugs - Ticks, Mites & Cyclops
12	General Pathology - Introduction - Inflammation - Healing and regeneration - Repair - Cell injury & cell death - Blood pressure & Diabetes	- Demonstration of computer Slide of: some pathological slides - signs of inflammation. - Chronic Non specific inflammation - Acute localized suppurative inflammation - Acute diffuse suppurative inflammation - Tuberculous granuloma - Serous Inflammation (effusion) - Edema - Coagulative necrosis Liquefactive necrosis Granulation tissue Fatty degeneration in liver
13	- Thrombosis & Embolism - Ischemia & Infarction - Sclerosis & Heart failure - Blood disorders - Apoptosis - Necrosis	**Practical exam**

14	- Growth Disorders: Neoplastic and non-neoplastic growth - Genetic Disorders: Degenerative Disorders - Hepatic & Pulmonary Disorders - Diseases of nervous system	
15	Written exam	

E- Teaching and Learning Methods:

- Lectures
- Practical sessions
- Self learning (Activity, Internet search, case report, poster preparation)
- Case study

F- Student Assessment Methods:

1- Written exam to assess a1, a2, a3, a4, a5, a6, c1, d3

2- Activity to assess d2, d3

3- Practical exam to assess b1, b2, b3, b4, c2, d1,

4-oral exam to asses: a1, a2, a3, a4, a5, a6, c1, d1, d2

Assessment schedule:

Assessment (1): Written exams	Week 15
Assessment (2): Activity	Week 5
Assessment (3): Midterm **exam**	Week 7
Assessment (4): Practical exam	Week 13
Assessment (4): oral exam	Week 15

Weighting of Assessment:

Assessment method	**Marks**	**Percentage**
Written exam	50	50%
Activity	5	5%
Practical exam	20	20%
Mid-term exam	10	10%
Oral exam	15	15%
TOTAL	100	100%

G- Facilities Required for Teaching and Learning:

- Black (white) board, data show, microscopes.

H- List of References:

A- Parasitology:

1- Student book of Parasitology and pathology-Lecture approved by Microbiology department & practical notes by staff of the department 2019.

2- Essential Books:

i- Medical Parasitology (9th edition); Markell and Voge's, W.B. Saunders Company (2006).

ii- District Laboratory practice in Tropical countries.

iii- MONICA CHEESBROUGH, Printed in Great Britain at University press, Cambridge (2005).

iv- Clinical Parasitology (ninth Edition); Beaver, P.C.; Jung, R.C. and Cupp, E.W. Lea & Febiger; Philadelphia (2019).

3- Recommended Books

Manson's Tropical Diseases (23rd edition), Cook GC (ed), London: WB Saunders (2013).

4- Periodicals, Web Sites

http://medicaleducationonline.org/

http://www.parasitesonline.net

http://pathmicro.med.sc.edu/book/parasit-sta.htm

http://www.dpd.cdc.gov/dpdx/HTML/Para_Health.htm

Course Coordinator: **Prof. Dr. Ghada Hamed Shaker**

Head of Department: **Prof. Dr. Nehal Elsayed Youssif**

Date: **تم مناقشة وإعتماد توصيف المقرر من مجلس القسم بتاريخ 30 / 9 /2019م**

Matrix1 of Parasitology & Pathology

	Course content	ILOs													
		Knowledge and Understanding					Professional & Practical skills					Intellectual skills		Transferable & general skills		
		a1	a2	a3	a4	a5	d6	b1	b2	b3	b4	c1	c2	d1	d2	d3
1	General Introduction **Practical** General terms of parasitology	x						x								
2	-Helminthology a-Trematodes -General characters -Fasciola species - **Practical** Parasitological laboratory examination: Sample collection Evaluation of different techniques used in the diagnosis of parasitic infections:	x		x	x	x	x		x	x		x	x			
3	Heterophyes - Schistosoma Case report **Practical** -Demonstration of microscopic slides of -Fasciola species -Heterophyes species	x		x	x	x	x		x	x		x	x			

	-Schistosoma species -Demonstration of Snails hosts														
4	**Cestodes**: • General characters • Taenia saginata • Taenia solium • Cysticercosis Case report **Practical** Demonstration of microscopic slides of: • Taenia saginata • Taenia solium			**x**	**x**	**x**	**x**	**x**	**x**						**x**
5	Echinococcus sp. Hymenolepis sp. Diphyllobothrium sp. **Nematodes**:` • General characters • Ascaris lumbricoides • Hook worm sp **Practical** Demonstration of microscopic slides of : • Echinococcus sp. • Ascaris lumbricoides	**x**		**x**	**x**		**x**	**x**	**x**						**x**

	• Hook worm sp. • Activity (report)														
6	• Enterobius & Trichuris • Trichinella spiralis • Wuchereria species • Case report **Practical** Demonstration of microscopic slides of • Enterobius & Trichuris • Trichinella spiralis • Wuchereria species	**x**	**x**	**x**	**x**		**x**	**x**	**x**						**x**
7	• **Midterm exam**														
8	Leishmania species Protozooly Amoebae species Balantidim coli Giardia lamblia Trichomos vaginalis Case report Trypanosma species **Practical** Leishmania species Trypanosoma species. morphologic stages of: Amoebae species Balantidum coli Giardia lamblia	**x**	**x**				**x**	**x**	**x**						

	Trichomonas vaginalis														
9	Plasmodium species Toxoplasma gondii Case study **Practical** Plasmodum species Toxoplasma gondii Lab. Diagnosis of parasitic infections	**x**		**x**	**x**	**x**	**x**			**x**					
10	Mosquito species Lice, Fleas, Bugs -Ticks, Mites & Cyclops **Practical** Demonstration of microscopic slides of: Mosquito species Lice, Fleas, Bugs Ticks, Mites & Cyclops		**x**	**x**			**x**		**x**				**x**	**x**	**x**
11	General Pathology - Introduction - Inflammation - Healing and regeneration - Repair - Cell injury & cell death - Blood pressure & Diabetes **Practical** Demonstration of computer Slide of signs of inflammation. Chronic Non specific		**x**		**x**		**x**		**x**				**x**	**x**	**x**

	inflammation Acute localized suppurative inflammation Acute diffuse suppurative inflammation Tuberculous granuloma Serous Inflammation (effusion) Edema Coagulative necrosis Liquefactive necrosis Granulation tissue Fatty degeneration in liver															
12	-Thrombosis & Embolism Ischemia & Infarction Sclerosis & Heart failur Blood disorders Apoptosis & Necrosis				**x**	**x**	**x**	**x**		**x**						
13	Growth Disorders Neoplastic and non-neoplastic growth Genetic Disorders: Degenerative Disorders Hepatic & Pulmonary Disorders Diseases of nervous system				**x**	**x**	**x**	**x**						**x**	**x**	**x**

Matrix II of Parasitology & Pathology

NARS		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods			Method of assessment			
						lecture	practical session	Activity	written exam	practical exam	oral exam	Midterm exam
2.1	Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice.	A4	a1	- General Introduction -Helminthology 2a-Trematodes: -General characters -Fasciola species -Short essay questions Heterophyes species Schistosoma species	Student book Essential books	x			x		x	x
			a2	Cestodes: General characters Taenia saginata Taenia solium Cysticercosis - Echinococcus sp. - Hymenolepis sp. - Diphyllobothrium sp. Nematodes:` - General characters - Ascaris lumbricoides Hook worm sp.	Student book Essential books	x			x		x	x

2.12	Etiology, epidemiology, laboratory diagnosis and clinical features of different diseases and their pharmacotherapeutic approaches.	A27 A28 A29	a4 a5 a6	-Enterobius & Trichuris -Trichinella spiralis -Wuchereria species -Case report Protozoology -Amoebae species -Balantidium coli -Giardia lamblia -Trichomonas vaginalis -Case report -Leishmania species -Trypanosoma species. Case report -Plasmodium species -Toxoplasma gondii Case study Entomology -General characters -Mosquito species -Lice, Fleas, Bugs -Ticks, Mites & Cyclops Parasitic Infections: Clinical Manifestations, Diagnosis and Treatment -Parasitological laboratory examination: -Sample collection	Student book Essential books Student Notes Essential books	x	x	x	x	X	x	x

				-Evaluation of different techniques used in the diagnosis of parasitic infections: -Microscopical Serology Modern molecular techniques (e.g. PCR) General Pathology -Introduction -Inflammation -Healingand regeneration -Repair -Cell injury & cell death -Blood pressure & Diabetes Demonstration of computer Slide of: some pathological slides Cardinal signs of inflammation Neutrophile margination Dilated congested capillaries. Chronic Non specific inflammation Acute localized suppurative inflammation (acute lung abcess)	Practical notes							
					Student notes		x	x		X		
3.5	Select medicines based on understanding etiology and path physiology of diseases.	B8	b2		Student notes and practical note		x	x		x		
3.6	Monitor and control microbial growth and carry out laboratory tests for identification of Infectious and non- infections in biological specimens.	B10 B11	b 3 b4		Student notes and practical note		x	x		X		

				Acute diffuse suppurative inflammation (Cellulitis) Tuberculous granuloma foreign body giant cell granuloma Serous Inflammation (effusion) Edema Demonstration of computer Slide of: other pathological slides Coagulative necrosis Liquefactive necrosis Granulation tissue Fatty degeneration in liver Apoptosis in liver Adenoma liver Meningioma								
	3.1 Use the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	B1	b1	-Thrombosis& Embolism -Ischemia& Infarction -Sclerosis&Heart failure -Blood disorders -Apoptosis -Necrosis	Student notes		x	x		X		

4.9	Utilize the pharmacological basis of therapeutics in the proper selection and use of drugs in various disease conditions.	C14	c1	Growth Disorders Neoplastic and non-neoplastic growth Genetic Disorders: Degenerative Disorders Hepatic & Pulmonary Disorders Diseases of nervous system	Student book practical notes		x		x		x	x
4.13	Analyze and interpret experimental results as well as published literature.	C18	C 2	-Demonstration of microscopic slides of morphologic stages of: -Fasciola species -Heterophyes species -Schistosoma species -Demonstration of Snails hosts Taenia saginata Taenia solium -Echinococcus sp. -Ascaris lumbricoides -Hook worm sp -Enterobius & Trichuris -Trichinella spiralis -Wuchereria species -Amoebae species	Practical note		x		x		x	x

				-Balantidium coli -Giardia lamblia -Trichomonas vaginalis								
5.1	Communicate clearly by verbal and means	D1	d 1									
5.2	Retrieve and evaluate information from different sources to improve professional competencies	D2	d2	activity	Internet search			x			x	
5.10	Demonstrate critical thinking, problem-solving and decision-making abilities	D11	d 3	Activity	Internet search		x	x	x	x	x	x

COURSE SPECIFICATIONS

Medicinal Chemistry-2

Third year – secondTerm
2019-2020

Course specification of Medicinal Chemistry (2)

University: **Zagazig** **Faculty:** **Pharmacy**

A- Course specifications:

Programme(s) on which the course is given: Bachelor of Pharmacy

Major or Minor element of programmes: Major

Department offering the program: -------

Department offering the course: Medicinal chemistry department

Academic year/level: third year/ Second term

Date of specification approval: **24/2/2020**

B- Basic information:

Title: MC321 Code: **MC321**

Credit Hours: ---

Lectures: 2 hrs/week

Practical: 2 hr/week

Tutorials: ---

Total: 3 hrs/week

C- Professional information:

1-Overall Aims of the Course:

On completion of the course, students will be able to:

On completion of the course, the student will be able to enumerate the therapeutic drugs of different uses with their mode of action and synthetic pathways (antimycobacterium, antineoplastic, antiviral, oral hypoglycemic, diagnostic agents, cardiovascular acting drugs and diuretics).

2- Intended Learning Outcomes (ILOs):

A- Knowledge and Understanding:	
a1	Describe basics of chemistry of different drug classes (antimycobacterium, antineoplastic, antiviral, oral hypoglycemic, diagnostic agents, cardiovascular acting drugs and diuretics).
a2	Outline synthetic pathways of the aforementioned drugs.
a3	Recognize mode of action & SAR of the aforementioned drugs.
B- Professional and Practical skills:	
b1	Handle basic laboratory equipments and chemicals effectively and safely.
b2	Identify the active substances (sulfa drugs, aliphatic & aromatic acids & sodium salts).
b3	Establish a research study for assay and analysis of commercial drugs (boric acid and compare results with the pharmacopeia).
C- Intellectual skills:	
c1	Develop GLP guide lines in pharmacy practice through learning different analytical techniques.
c2	Predict quantitative and qualitative methodology of raw materials (boric acid, hexamine, hydrogen peroxide) and pharmaceutical preparations.
D-General and Transferable skills:	
d1	Work effectively as a member of a team with other students.
d2	Write reports and present it.
d3	Develop problem solving and decision making skills.

D- Contents:

Week No.	Lecture contents (2 hrs/lec.)	Practical session (2hrs/lab)
1	Antimycobacterium agents.	Laboratory safety measures.
2	Antineoplastic agents (Alkylating agents).	Quantitative estimation of boric acid.
3	Antineoplastic agents (Alkylating agents, antimetabolites).	Quantitative estimation of hexamine.
4	Antineoplastic agents (antimetabolites, hormones)	Quantitative estimation of tolbutamide.
5	Antiviral agents (host cell penetration inhibitors and nucleic acid inhibitors).	General Scheme Activity 1 (Reports).
6	Antiviral agents (protein inhibitors).	- Identification of boric acid, borax, urea and hexamine.
7	Midterm exam	
8	Oral hypoglycemic agents (sulfonylurea derivatives)	-Identification of sulpha drugs.
9	Oral hypoglycemic agents (biguanide derivatives) Diagnostic agents	-Identification of organic acids and its salts of pharmaceutical use.
10	Antianginal agents & antiarryhthmic drugs	-Identification of iron, zinc and magnesium salts of pharmaceutical use. -Activity 2 (Reports).
11	Antihypertensive agents	Revision scheme 1.
12	Anticoagulants & Antihyperlipidemic agents.	Revision scheme 2.
13	Diuretics (water and osmotic agents, acidifying salts, mercurials , α,β unsaturated ketones, purines , pyrimidines)	Practical exam.
14	Diuretics (sulfonamide derivatives and endocrine antagonists)	Practical exam.
15	Final written exam	

E- Schedule of Assessment Tasks for Students During the Semester:

1- Written exam to assess a1, a2, a3, c1, c2

2- Activity to assess d1, d2, d3

3- Practical exam to assess b1, b2,b3, c1, c2, d1, d2, d3

4- Oral exam to assess a1, a1, a3, c1, c2

	Assessment task (e.g. essay, test, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	midterm exam	Week 7	10 %
2	Activity (Reports)	Weeks 5, 10	5 %
3	Practical exam	Weeks 13,14	20 %
4	Written exam	Week 15	50 %
5	Oral exam	Week 15	15 %
Total			100 %

F- Facilities required for teaching and learning:

1. Black (white) board.
2. Data show Presentation.
3. Explanatory videos.
4. Laboratory equipment (test tubes, piurettes and conical flasks).
5. Chemicals.

G-Teaching and learning methods:

- Lectures.
- Practical sessions.
- Activity (Reports).
- Self learning

H- List of References:

1- Course Notes:

- Practical notes of Medicinal chemistry (2) approved by medicinal chemistry department 2019-2020.

2- Essential Books:

- Foye's Principles of Medicinal Chemistry; Williams, David A., William O. Foye, and Thomas L. Lemke; Lippincott Williams and Wilkins (2016).
- B.p. &U.S Pharmacopia (1988-2017)
- An Introduction to Medicinal Chemistry; Patrick, Graham L, Oxford (2017)

3- Periodicals, Web Sites, etc

- http://www.ncbi.nlm.nih.gov/sites/entrez
- http://www.ekb.eg
- http://journals.tubitak.gov.tr/chem/index.php
- http://www.pharmacopoeia.co.uk/
- www.Pubmed.Com
- www.sciencedirect.com

Course Coordinator: Prof. Dr./ Sobhy M. El-Adl

Head of Department: Prof. Dr./ Kamel A. Metwally.

Date: 24/2/2020 تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ

Matrix I of Medicinal chemistry 2 course												
Course Contents		ILOs of Medicinal chemistry 2 course										
		Knowledge and understanding			Professional and practical skills			Intellectual skills		General and transferable skills		
Lectures		a1	a2	a3	b1	b2	b3	c1	c2	d1	d2	d3
1	Antimycobacterium agents	x	x	x								
2	Antineoplastic agents(Alkylating agents)	x	x	x								
3	Antineoplastic agents(Alkylating agents, antimetabolites)	x	x	x								
4	Antineoplastic agents(antimetabolites, hormones)	x	x	x								
5	Antiviral agents (host cell penetration inhibitors and nucleic acid inhibitors) (host cell penetration inhibitors and nucleic acid inhibitors)	x	x	x								
6	Antiviral agents(protein inhibitors)	x	x	x								
7	Oral hypoglycemic (sulfonylurea derivatives) (sulfonylurea derivatives) (sulfonylurea derivatives)	x	x	x					x			
8	Oral hypoglycemic (biguanide derivatives) & diagnostic agents	x	x	x								
9	Antianginal agents & antiarryhthmic drugs	x	x	x								
10	Antihypertensive agents	x	x	x					x			
11	Anticoagulants & antihyperlipidemic agents	x	x	x								
12	Diuretics (water and osmotic agents, acidifying salts, mercurials , α,β unsaturated ketones, purines , pyrimidines)	x	x	x								
13	Diuretics (sulfonamide derivatives and endocrine antagonists)	x	x	x					x			
Practical sessions												

1	Laboratory safety measures				x							
2	Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide				x		x	x	x	x	x	
3	Identification of organic acids / salts,iron , zinc and magnesium salts, sulpha, boric acid, urea and hexamine of pharmaceutical use				x	x		x	x	x		
4	Activities									x	x	x

Matrix II of Medicinal Chemistry 2 course

National Academic Reference Standards (NARS)		Program ILOs	Course ILOs	Course contents	Sources	Teaching and learning methods			Methods of assessment		
						lecture	practical session	Activity (Reports)	written exam	practical exam	oral exam
2.1	Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice.	A2	a1	Antimycobacterium agents	Student book	x			x		x
				Antineoplastic agents(Alkylating agents)	Student book	x			x		x
				Antineoplastic agents(Alkylating agents, antimetabolites)	Student book	x			x		x
				Antineoplastic agents(antimetabolites, hormones)	Student book Essential books	x		X	x		x
				Antiviral agents (host cell penetration inhibitors and nucleic acid inhibitors)	Student book	x			x		x
				Antiviral agents(protein inhibitors)	Student book	x			x		x
				Oral hypoglycemic (sulfonylurea derivatives) (sulfonylurea derivatives)	Student book	x			x		x

				(sulfonylurea derivatives)							
				Oral hypoglycemic (biguanide derivatives) & diagnostic agents	Student book Essential books	x			x		x
				Antianginal agents & antiarryhthmic drugs	Student book	x			x		x
				Antihypertensive agents	Student book	x			x		x
				Anticoagulants & antihyperlipidemic agents	Student book Internet Recommended books	x		X	x		x
				Diuretics (water and osmotic agents, acidifying salts, mercurials , α,β unsaturated ketones, purines , pyrimidines)	Student book Essential books	x			x		x
				Diuretics (sulfonamide derivatives and endocrine antagonists)	Student book	x			x		x
2.5	Principles of drug design, development and synthesis.	A15	a2	Antimycobacterium agents	Student book	x			x		x
				Antineoplastic agents(Alkylating agents)	Student book	x			x		x
				Antineoplastic agents(Alkylating agents, antimetabolites)	Student book Internet Recommended books	x		X	x		x

				Antineoplastic agents(antimetabolites, hormones)	Student book	x			x		x
				Antiviral agents (host cell penetration inhibitors and nucleic acid inhibitors)	Student book	x			x		x
				Antiviral agents(protein inhibitors)	Student book	x			x		x
				Oral hypoglycemic (sulfonylurea derivatives)	Student book	x			x		x
				Oral hypoglycemic (biguanide derivatives) & diagnostic agents	Student book	x			x		x
				Antianginal agents & antiarryhthmic drugs	Student book	x			x		x
				Antihypertensive agents	Student book Internet Recommended books	x		X	x		x
				Anticoagulants & antihyperlipidemic agents	Student book	x			x		x
				Diuretics (water and osmotic agents, acidifying salts, mercurials , α,β unsaturated ketones, purines ,	Student book	x			x		x

				pyrimidines)							
				Diuretics (sulfonamide derivatives and endocrine antagonists)	Student book	x			x		x
2.13	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra-indications, ADRs and drug interactions.	A30	a3	Antimycobacterium agents	Student book	x			x		x
				Antineoplastic agents(Alkylating agents)	Student book	x			x		x
				Antineoplastic agents(Alkylating agents, antimetabolites)	Student book	x			x		x
				Antineoplastic agents(antimetabolites, hormones)	Student book Internet Recommended books	x		X	x		x
				Antiviral agents (host cell penetration inhibitors and nucleic acid inhibitors)	Student book	x			x		x
				Antiviral agents(protein inhibitors)	Student book	x			x		x
				Oral hypoglycemic (sulfonylurea derivatives)	Student book	x			x		x
				Oral hypoglycemic (biguanide derivatives) & diagnostic agents	Student book	x			x		x

				Antianginal agents & antiarryhthmic drugs	Student book	x			x		x
				Antihypertensive agents	Student book	x			x		x
				Anticoagulants & antihyperlipidemic agents	Student book Internet Recommended books	x		X	x		x
				Diuretics (water and osmotic agents, acidifying salts, mercurials , α,β unsaturated ketones, purines , pyrimidines)	Student book	x			x		x
				Diuretics (sulfonamide derivatives and endocrine antagonists)	Student book	x			x		x
3.2	Handle and dispose chemicals and pharmaceutical preparations safely	B2	b1	Laboratory safety measures	Practical notes		X			x	

3.4	Extract, isolate, synthesize, purify, identify, and/or standardize active substances from different origins.	B6	b2	Identification of organic acids / salts,iron , zinc and magnesium salts, sulpha, boric acid, urea and hexamine of pharmaceutical use	Practical notes		X			x	
3.11	Conduct research studies and analyze the results	B19	b3	Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide	Practical notes		X			x	
4.2	Comprehend and apply GLP, GPMP, GSP and GCP guidelines in pharmacy practice	C3	c1	Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide	Practical notes		X			x	
				Identification of organic acids / salts,iron , zinc and magnesium salts, sulpha, boric acid, urea and hexamine of pharmaceutical use	practical notebook		X			x	

4.3	Apply qualitative and quantitative analytical and biological methods for QC and assay of raw materials as well as pharmaceutical preparations	C7	c2	Oral hypoglycemic (sulfonylurea derivatives)	Student book Internet Recommended books	x		x	x		X
				Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide	Practical notes		X			x	
				Identification of organic acids / salts,iron , zinc and magnesium salts, sulpha, boric acid, urea and hexamine of pharmaceutical use	Practical notes		X			x	
5.3	Work effectively in a team	D3	d1	Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide	Practical notes		X			x	
5.9	Implement writing and presentation	D10	d2	Activity	Internet Recommended books		X	x		x	

	skills			Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide, Activity	Practical notes		X			x	
5.10	Implement writing and thinking, problem solving and decision making skills	D11	D3	Activity	Internet Recommended books		x	x		x	

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Head of Department: Prof. Dr./ Kamel A. Metwally.

Date: 24/2/2020 تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ