

**Third Year – Second Term** 

# 2018-2019

# **CONTENTS:**

	Course	Page
		No.
1	Sterile Products and Controlled Drug Delivery Systems	3
2	Phytochemistry-1	17
3	Pharmacology -2	30
4	Biochemistry -2	40
5	Parasitology and Pathology	57
6	Medicinal Chemistry-2	76

# COURSE SPECIFICATIONS

Sterile Products and Controlled Drug Delivery Systems

Third year – secondTerm 2018-2019

# Course specification of Sterile Products and Controlled Drug Delivery Systems

University: Zagazig		Faculty:	Pharmacy
A- Course specification	ıs:		
Program (s) on which the c	ourse is given:	Bachelor of Phan	rmacy
Major or Minor element of	programs:	Major	
Department offering the pro-	ogram:		
Department offering the co	urse: Pha	armaceutics Depar	tment
Academic year Level:	Т	hird year/Second	semester
Date of specification appro	val:	3 January 2019	
<b>B- Basic information:</b>			
Title: Sterile Products and Con	trolled Drug Del	ivery Systems C	ode: PC325
Credit Hours:			

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)

<b>A-</b> ]	Knowledge and Understanding
al	Describe formulation requirements and quality control tests of
•••	aerosols.
a2	illustrate the principles and properties of different controlled drug
<b>u-</b>	delivery systems as well as colloidal drug delivery systems
a3	Outline the requirements, formulation and quality control tests of
us	parentrals and ophthalmic dosage forms
a4	Illustrate the basis of sterilization and packaging of parentrals and
a	ophthalmic dosage forms
<b>B-</b> ]	Professional and Practical skills
	perform different calculations related to compounding of
b1	parentrals including isotonicity adjustment, milliequivalent,
	osmolarity and rate of flow of intravenous infusions
<b>C-</b> ]	Intellectual skills
c1	Select the appropriate drug delivery system according to drug
C1	properties and the intended site and rate of drug release
c2	Interpret results of quality control tests of parentrals and aerosols
02	according to the pharmacopeial requirments
<b>D-</b>	General and Transferable skills
<b>d</b> 1	Use information technology to collect and present data
d2	Develop critical thinking, decision-making and problem-solving
u2	skills.
d3	Work effectively as a member of a team

## **D- Contents:**

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

10	- Gastroretentive drug delivery systems	
	- Diffusion based sustained release dosage	
	forms	
	- Bioerodible sustained release dosage forms	Case study
	- Osmotic pressure activated controlled drug	
	delivery	
	- Targeted release dosage forms	
11	Colloidal drug delivery systems	Revision
	Liposomes	evidence-based assignment
12	Colloidal drug delivery systems	Delivery of assignment report
	- Niosomes	Derivery of assignment report
13	Colloidal drug delivery systems	Practical exam
	- Microemulsion	
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).

### **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

تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ 3/ 1 / 2019م :Date

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

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

		Matrix II	of Sterile	<b>Products and Controlle</b>	ed Drug D	elivery	Systems	s course	e		
National Academic Reference Standards		Program		<b>Course contents</b>	Sources	Sources Teaching and learning methods			Method of assessment		
	(NARS)					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; biopharmaceutical technology; pharmacokinetics; pharmacokinetics; pharmacognosy; pharmacognosy; pharmaceutical microbiology; molecular biology and pharmaceutical biotechnology; quality assurance and quality control; instrumental analysis and biological drug assays).	A2	a1 a2 a3 a4	<ul> <li>Pharmaceutical aerosols: <ul> <li>Advantages</li> <li>components</li> <li>Quality control of aerosols.</li> <li>Filling of aerosols</li> <li>Introduction to parentral preparations</li> <li>Advantages &amp; disadvantages of parenterals</li> <li>Requirements for parenteral preparations</li> <li>Routes of parenteral administration</li> <li>Classification of parenteral preparations Sterilization techniques moist heat , dry heat, radiation, gas and filtration Formulation of parentrals.</li> <li>Quality control tests of parentral preparations</li> </ul> </li> </ul>	Student book Essential books	Х			X		Х

				<ul> <li>Advantages &amp; disadvantages of delayed release dosage forms</li> <li>Enteric coating</li> <li>Colon specific drug delivery</li> <li>Gastroretentive drug delivery systems</li> <li>Diffusion based sustained release dosage forms</li> <li>Bioerodible sustained release dosage forms</li> <li>Osmotic pressure activated controlled drug delivery</li> <li>Targeted release dosage forms</li> <li>Colloidal drug delivery systems ( Liposomes )</li> <li>Colloidal drug delivery systems ( Niosomes )</li> <li>Colloidal drug delivery systems ( Niosomes )</li> </ul>					
2.6	Properties of different pharmaceutical dosage forms including novel drug delivery systems.	A.16 A17	al	Pharmaceutical aerosols (Advantages, components & preparation). Packaging of pharmaceutical aerosols Filling of aerosols.	Student book Essential books	Х		Х	х

		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
	a2	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
		Controlled release dosage forms for oral use Rational for extended release	Student book Essential books	X		x	X
a3	a3	Controlled drug delivery systems " coated beads, microencapsulation, complex formation, resinated drugs,etc"	Student book Essential books	X		х	x

2.10	Principles of public health issues including sources and control of microbial contamination as well as sanitation, disinfection,	A.23	a4	Colloidal drug delivery systems ( Liposomes, Niosomes and nanoparticles) Sterilization and packaging of parentral products. Manufacturing processes of	Student book Essential books Student book Essential	x		 x		x
	sterilization methods and microbiological QC of pharmaceutical			(ampoules-vials).	books					
	products.			Packaging of pharmaceutical aerosols	Student book Essential books	х		Х		x
				Isotonic solutions			х		Х	
				Electrolyte solutions: Milliequivalents, Milimoles and Milliosmoles	-		X		Х	
	Exceeding NARs	B21	<mark>b1</mark>	Intravenous Infusions, Parenteral Admixtures, and Rate-of-Flow Calculations	Practical notes		X		Х	
				Parenteral admixtures			х		Х	
				Parenteral Nutrition			х		х	
4.1	Apply pharmaceutical knowledge in the formulation of safe and effective medicines as well as in dealing with new drug delivery systems.	C.2	c1	<ul> <li>Introduction to drug delivery systems</li> <li>Advantages &amp; disadvantages of delayed release dosage forms</li> <li>Enteric coating</li> <li>Colon specific drug delivery</li> <li>Gastroretentive drug delivery</li> </ul>	Student book Essential books	х		X		x
	59500115.			<ul><li>systems</li><li>Diffusion based sustained release</li></ul>						

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

thinking, problem-	Electrolyte solutions:	notes			
solving and decision-	Milliequivalents, Milimoles and				
making abilities.	Milliosmoles				
	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

تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ 3/ 1 / Date: 2019

# COURSE SPECIFICATIONS

Phytochemistry-1

Third year – secondTerm 2018-2019

# **Course Specification of Phytochemistry I**

University:	Zagazig	Faculty:	Pharmacy
A- Course spec	cifications:		
Program(s) on wh	ich the course is giver	: Bachelor of Pharm	nacy
Major or Minor el	lement of programs:	Major	
Department offeri	ng the program:		
Department offeri	ng the course:	Pharmacognosy	
Academic year/Le	evel:	Third year / seme	ster 2
Date of specificat	ion approval:	/09/2018	
<b>B- Basic inform</b>	nation:		
Title: Phytochem	istry 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

<b>A-</b> ]	Knowledge and Understanding
	Define, state and classify certain classes of natural products
a1	(glycosides, tannins, carbohydrates, bitter principals, minerals, natural
aı	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-
a2	indications.
	Identify different analytical techniques used in natural products
a3	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
a4	carotenoids, resins and resin combination and natural antioxidants.
<b>B-</b> ]	Professional and Practical skills
b1	Handle chemicals, solvents and equipment safely.
	Choose the proper pharmaceutical terms and abbreviations for certain
1.0	classes of natural (glycosides, tannins, carbohydrates, bitter
b2	principals, minerals, natural carotenoids, resins and resin combination
	.(and natural antioxidants
b3	Examine different glycosides, tannins, carbohydrates, resins and resin
	combination and natural antioxidants.
b4	Prepare lab research reports on glycosides, tannins, carbohydrates, bitter principals, minerals, natural carotenoids, resins and resin
04	combination and natural antioxidants.
<b>C-</b> ]	Intellectual skills
	Estimate certain classes of naturally occurring products (glycosides,
<b>c</b> 1	tannins, carbohydrates, bitter principals, minerals, natural
	carotenoids, resins and resin combination and natural antioxidants).
	Predict the appropriate method for isolation and purification of
c2	different glycosides, tannins, carbohydrates, bitter principals,
	minerals, natural carotenoids, resins and resin combination and natural antioxidants.
<b>D</b> _ (	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	Lecture (2hrs/week)	Practical session
No.		(2hrs/week)
1	Glycosides	General properties of
	Classification, isolation and	glycosides and extraction
•	properties Characteristics	methods
2	Glycosides	Chemical tests for cardiac
	Phenolic glycosides, cyanogenic	glycosides and flavonoids.
3	glycosides, thioglycosides Glycosides	(Activity)
5	Cardiac glycosides	Get a copy of pamphlets for
	Cardiac grycosides	pharmaceutical products
		containing glycosides
4	Clueogidog	Chemical tests for
4	<b>Glycosides</b> Flavonoids and coumarins	anthraquinones and
	Travonolds and countarins	saponins.
5	Glycosides	Chemical tests for tannins
•	Anthraquinones, saponins and	and antioxidants.
	miscellaneous glycosides	
6		(Activity)
		Get a copy of pamphlets for
	Tannins and antioxidants	pharmaceutical products
		containing glycosides,
		tannins and antioxidants
7	Midterm written exam	
8	Carbohydrates	General properties of
	Definition, classification,	carbohydrates
	properties, evaluation, drugs	Chemical tests for
	containing carbohydrates	monosaccharides
9	Carbohydrates	Chemical tests for
	Heteropolysaccharides and	disaccharides
10	holopolysaccharides	
10	Bitter principals	Chemical tests for
11		polysaccharides
11	N.C In	Chemical tests for resins
	Minerals	and resin combination
		Activity)

12	Natural carotenoids	Get a copy of pamphlets for pharmaceutical products containing carbohydrates and resins and resin combination in pharmaceutical products Lab research report on different studied classes in theoretical part <b>Practical exam 1</b>
13	Resins and resin combination	Practical exam 2
14	Revision.	
15	Written exam	

### **E- Teaching and Learning Methods:**

- Lectures.
- Interactive lectures.
- Practical sessions.
- 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, b1,c1, c2, 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, b1, c1, c2 and d4.

#### **Assessment schedule:**

Assessment (1): Midterm written exam	Week 7
Assessment (2): Activity	Weeks 3, 6, 11
Assessment (3): Practical exam	Weeks 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 (2018).

### **2- Essential books:**

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.

تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ سبتمبر Date: 2018

	Matrix I of Phytocl	nem	istr	y I	cou	rse									
		ILOs of Phytochemistry I course													
	<b>Course Contents</b>			edge standi			fessi actica				ellectual skills	tra	Gene nsfera		
	Lectures				a4	<b>b1</b>	<b>b2</b>	<b>b3</b>	<b>b4</b>	<b>c1</b>	c2	<b>d1</b>	<b>d2</b>	<b>d3</b>	<b>d4</b>
1	Glycosides Classification, isolation and properties	x							X		х				
2	<b>Glycosides</b> 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	х				x	х	x				
5	Glycosides Anthraquinones, saponins and miscellaneous glycosides		x	x	x				x	X	Х				
6	Tannins and antioxidants	x	x	x	х				X	х	X				
7	<b>Carbohydrates</b> Definition, classification, properties, evaluation, drugs containing carbohydrates	x	x	x	x				x	x	X				
8	8 Carbohydrates Heteropolysaccharides and holopolysaccharides		x	x	х				x	X	X				
9	Bitter principals	х	х	x	х				X	x	X				

10	Minerals	x	x	х	X				x	Х	x				
11	Natural carotenoids	x	x	x	х				x	х	х				
12	Resins and resin combination	x	x	х	x				x	х	Х				
	Practical sessions														
13	General properties of glycosides and extraction methods					х		x			х			x	
14	Chemical tests for cardiac glycosides, flavonoids and coumarins.					х	х	х						х	
15	Glycosides in pharmaceutical products (activity).					х	x	x	x	х		x	x	x	x
16	Chemical tests for anthraquinones and saponins.					х	x	x						x	
17	Chemical tests for tannins and antioxidants.					х	х	х						х	
18	Glycosides, tannins and antioxidants in pharmaceutical products (activity).					X	х	x	x	x		x	x	х	х
19	General properties of carbohydrates Chemical tests for monosaccharides					x	x	x			x			x	
20	Chemical tests for disaccharides					х	х	х						x	
21	Chemical tests for polysaccharides					х	х	х						x	
22	Chemical tests for resins and resin combination Carbohydrates and resins and resin combination in pharmaceutical products Lab research report on different studied classes in theoretical part (activity).					x	x	x	x	X		x	x	x	x

			Μ	atrix II of Phytochemist	ry I co	urse							
National Academic Reference Standards (NARS)		Prog ram	Co urs		Sour ces		ng and le methods	<b>U</b>	Method of assessment				
		ILO s	e IL Os	<b>Course contents</b>		Lecture/ interacti ve lecture/ videos	Practica 1 session/ videos	Self learnin g	Writt en exam	Practic al exam	Or al ex am	Ac tivi ty	
				Theoretical sessions									
2.4	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds.	A12,	a1, a3 a4	<b>Glycosides</b> Classification, isolation and properties									
3.1	Use the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	B1	b1		Student book Essentia 1 books	x			x		x		
4.5	Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	<b>C9</b>	c1, c2										
2.13,	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra- indications, ADRs and drug interactions.	A30,	a2,	<b>Glycosides</b> Phenolic glycosides, cyanogenic glycosides,	Student book								
3.1	Use the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	B1	b1	thioglycosides Cardiac glycosides Flavonoids and coumarins	Essentia 1 books Internet	X			X		X		

4.5	Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	C9	c2,	Anthraquinones, saponins and miscellaneous glycosides <b>Carbohydrates</b> Heteropolysaccharides and holopolysaccharides							
2.4	Principles of isolation, synthesis, purification, identification, and standardization methods of pharmaceutical compounds.	A12,	a1, a3, a4	Tannins and antioxidants Carbohydrates Definition, classification,							
2.13,	Pharmacological properties of drugs including mechanisms of action, therapeutic uses, dosage, contra- indications, ADRs and drug interactions.	A30,		properties, evaluation, drugs containing carbohydrates <b>Bitter principals</b>	Student book Essentia 1 books	x		x		x	
4.5	Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	C9	c1, c2,	Minerals Natural carotenoids Resins and resin combination	Internet						
				Practical sessions							
3.2	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations.	B2, ,	b2,	General properties of glycosides and extraction methods	Practica		v		v		
3.4	Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different	B6	b3		l notes		X		X		
3.11	Conduct research studies and analyze the results	B19	b4,								

4.5	Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	C9	c2									
5.9	Implement writing and presentation skills.	D10	d3									
3.2	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations.	B2	b2,	Chemical tests for cardiac glycosides, flavonoids and								
3.4	Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins.	B6	b3	coumarins. Chemical tests for	Practica		х			x		
	Ex NARs	B22	<b>b4</b>	anthraquinones and								
5.9	Implement writing and presentation skills.	D10	d3	saponins. Chemical tests for tannins and antioxidants. Chemical tests for disaccharides and polysaccharides	l notes							
3.2	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations.	B2,	<b>B2</b> ,	· · · · · · · · · · · · · · · · · · ·		es net ts mu y ma	X	X				
3.4	Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins.	B6	b3	pharmaceutical products	Practica l notes Internet Visits for commu nity pharma cies							
	Ex NARs	B22	b4							х		v
4.5	Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of active substances from different origins.	C9	c1 c2									X
5.8	Demonstrate creativity and time management abilities.	D9	d2									

5.3	Work effectively in a team.	D3	<b>d1</b>						
5.9	Implement writing and presentation skills.	D10	d3						
5.10	Implement writing and thinking, problem- solving and decision- making abilities.	D11	d4						
3.2	Handle chemicals and pharmaceutical products effectively and safely with respect to relevant laws and legislations.	B2,	b2,	General properties of carbohydrates					
3.4	Extract, isolate, synthesize, purify, identify, and /or standardize active substances from different origins.	B6	b3	Chemical tests for					
	Ex NARs	B22	b4	monosaccharides	Practica 1 notes	х		x	
4.5	Select the appropriate methods of isolation, synthesis, purification, identification, and standardization of	C9	c1		Thotes	Α		~	
	active substances from different origins.		c2						
5.9	Implement writing and presentation skills.	D10	d3						

# COURSE SPECIFICATIONS

# Pharmacology -2

Third year – secondTerm 2018-2019

# **Course Specification of Pharmacology -II**

University:	Zagazig	Faculty:	Pharmacy
A- Course specif	ications:		
Program(s) on whic	h the course is given:	Bachelor of Pha	armacy
Major or Minor eler	nent of programs:	Major	
Department offering	g the program:		
Department offerin	g the course: I	Pharmacology an	d toxicology
department			
Academic year / Le	vel: Third	year / Second ter	·m

Date of specification approval: February 2019

### **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-I	A- Knowledge and Understanding						
al	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- F	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-I	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- (	D- General and Transferable Skills						
<b>d</b> 1	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.	<ul> <li>Lab safety measures</li> <li>Handling of experimental animals and routes of drugs administration (mice) (1)</li> </ul>
2	<ul> <li>Drugs used for treatment of anxiety and sleep disorders.</li> <li>Treatment of depression and mania.</li> <li>Drugs used for treatment of mania and bipolar disorder</li> </ul>	<ul> <li>Lab safety measures</li> <li>Handling of experimental animals and routes of drugs administration (mice) (2)</li> </ul>
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	<ul><li>Analgesics (1)</li><li>Activity (reports)</li></ul>
11	• Anti-inflammatory, antipyretic and analgesic agents.	<ul><li>Analgesics (2)</li><li>Activity (reports)</li></ul>
12	• Respiratory system pharmacology.	Practical exam
13	• Gastrointestinal pharmacology.	Practical exam
14	<ul> <li>Drugs used for treatment of anemia</li> <li>Hematopoietic growth factors.</li> </ul>	
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%

#### **<u>F- Facilities required for teaching and learning:</u>**

• 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

-----

#### **Course Coordinator: Prof.Dr. Shimaa Mostafa El Shazly**

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

تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ / 2 / Date: 2019

	Matrix I											
					-	ILOs	of the	e cours	se			
	<b>Course Contents</b>		owledge derstane		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	х	Х				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.	Х	x	X				х	x			
4	Antiepileptic drugs.	Х	X	х				х	X			
5	Pain control with general and local anaesthetics.	Х	X	X				X	Х			
6	Central nervous system stimulants.	Х	X	Х				X	Х			
7	Mid-term	X	Х	X				х	X			
8	Anti hyperlipidemic drugs	X	X	X				X	X			
9	Drugs used in coagulation and bleeding disorders.	Х	Х	х				x	X			
10	Autacoids	Х	X	X				х	Х			
11	Anti-inflammatory, antipyretic and analgesic agents.	Х	X	X				X	x			
12	Respiratory system pharmacology.	Х	Х	Х				X	Х			
13	Gastrointestinal pharmacology.	Х	X	X				X	х			
14	Drugs used for treatment of anemia Hematopoietic growth factors.	X	X	X				X	X			
15	Revision and open discussion	Х	X	X		1		x	x			
		<b></b>	Practic	al sessi	ons				ı			
1	<ul> <li>Lab safety measures</li> <li>Handling of experimental animals and routes of drugs administration (mice) (1)</li> </ul>				X	X	X				X	
2	<ul><li>Lab safety measures</li><li>Handling of experimental</li></ul>				х	X	х				Х	

			1		1	-			
	animals and routes of drugs								
	administration (mice) (2)								
	- Handling of experimental		х	х	х			х	
3	animals and routes of drugs								
	administration (frogs) (1)								
	- Handling of experimental		Х	Х	х			х	
4	animals and routes of drugs								
	administration (frogs) (2)								
5	- CNS stimulants (1)		х	Х	x			x	
	- CNS stillulaits (1)								
6	- CNS stimulants (2)		Х	Х	Х			Х	
7	- CNS depressants (1)		х	х	х			Х	
0			Х	Х	Х			х	
8	- CNS depressants (2)								
	Analogies (1)		v	v	v		 v	v	v
9	- Analgesics (1)		х	Х	х		х	х	х
	- Activity (reports)								
10	- Analgesics (2)		Х	Х	Х		х	Х	Х
	- Activity (reports)								
11	- Practical exam		Х	Х	х		x	х	x
					1	1			

				Matrix II of Ph	armacolog	у II соі	ırse					
Nat	ional Academic	Program   Course			Teaching and learning methods			Method of assessment				
Star	Reference ndards (NARS)	ILOs	ILOs	Course contents	Sources	Lecture	Practical session	Self- learning	Written exam	Practical exam	Midterm exam	Oral exam
	Etiology, epidemiology, laboratory diagnosis	A27	a1 a2		Student book,							
2.12	and clinical features of different diseases and their pharmacotherapeutic approaches.	A29	a3	All topics	Essential books	x			х		x	X
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	В3	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	х			x		x
5.3	Work effectively in a team	D3	d1	Activity and practical session	Practical notes Recommended books Internet		X	Х		х	
5.4	Use numeracy, calculation and statistical methods as well as information technology tools.	D4	d2	Practical session	Practical notes Recommended books Internet			x		Х	
5.9	Implement writing and presentation skills.	D10	d3	Activity	Recommended books Internet			x		х	

# COURSE SPECIFICATIONS

# **Biochemistry -2**

Third year – secondTerm 2018-2019

# **Course Specification of Biochemistry (2)**

University:	Zagazig	Faculty:	Pharmacy
A- Course specifie	cations:		
Program(s) on which	the course is given:	Bachelor of Ph	armacy
Major or Minor elem	ent of programs:	Major	
Department offering t	he program:		
Department offering t	he course:	Biochemistry I	Department
Academic year/ Level	l: 2018/2019	Third year /sec	ond term
Date of specification	approval:	27/8/2018	
<b>B- Basic informat</b>	ion:		
Title: Biochemistry (2	2)	Code: BC32	21
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) (ILOs):

<b>A-</b> ]	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>B-</b> ]	Professional and Practical skills					
<b>b</b> 1	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.					
<b>C-</b> ]	Intellectual skills					
c1	Apply different biological methods used to assay different metabolites and biological samples.					
c2	Correlate between different metabolic pathways					
<b>D-</b>	D- General and Transferable skills					
<b>d</b> 1	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	<ul> <li>Carbohydrates digestion and absorption</li> <li>Metabolism of mono and disaccharides</li> <li>Glycolysis (Reactions, steps and regulation)</li> </ul>	- Laboratory safety measures
2	<ul> <li>Gluconeogenesis (Reactions and regulation)</li> <li>Tricarboxylic acid cycle (Reactions, regulation and calculation of energy produced)</li> </ul>	-Lipid metabolism -Lipid profile -Determination of triglycerides
3	- HMP shunt (Reactions and functions) - Uronic acid pathway (Reactions)	-Determination of cholesterol
4	<ul> <li>Glycogen metabolism</li> <li>Glycogenesis regulation</li> <li>Glycogenolysis regulation</li> </ul>	-Methods of determination of HDL-c and LDL-c
5	<ul> <li>Digestion and absorption of lipids</li> <li>Plasma lipids</li> <li>Oxidation of fatty acids</li> </ul>	-Lipid metabolism abnormalities case.
6	<ul> <li>Lipogenesis</li> <li>Lipolysis in adipose tissues.</li> <li>Phospholipid metabolism</li> </ul>	-Protein metabolism. -Determination of serum urea level.
7	Midterm exam	
8	<ul> <li>Ketone bodies metabolism</li> <li>Self-learning activities (Diabetes – glycogen storage disease)</li> </ul>	-Determination of serum uric acid level.
9	<ul> <li>Cholesterol metabolism</li> <li>Lipoproteins metabolism</li> <li>Self-learning activities (fatty liver)</li> </ul>	-Protein metabolism abnormalities case.
10	<ul> <li>Protein turnover</li> <li>Digestion and absorption of dietary proteins.</li> <li>Nitrogen metabolism</li> <li>Transamination</li> </ul>	- Revision / Quiz
11	<ul> <li>Deamination</li> <li>Transdeamination</li> <li>Metabolism of ammonia</li> <li>Urea cycle</li> <li>Self-learning activities (Growth</li> </ul>	- Activity presentation.

	formula, benefits and hazards)	
12	- Conversion of amino acids to specialized products	-Practical exam
13	<ul> <li>Conversion of amino acids to specialized products (continue)</li> <li>Metabolic correlation associated with some diseases</li> </ul>	
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 2018.
- Practical notes of Biochemistry (2) approved by biochemistry department 2018.

#### **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 (31<sup>st</sup> edition); <u>Rodwell</u> V.W., <u>Bender</u>
   D., <u>Botham</u> K.M., <u>Kennelly</u> P.J., <u>Weil</u> 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 Bio	chen	nistr	y-2 (	cour	:se						
							ILOs	of Bioche	emistry-	2 cours	e	
	<b>Course Contents</b>		wledge erstand			ofessi d prac skill	ctical	Intellectu	al skills	_	eneral ar ferable s	
	Lectures	<b>a1</b>	a2	<b>a3</b>	<b>b1</b>	<b>b2</b>	<b>b3</b>	<b>c1</b>	c2	<b>d1</b>	<b>d2</b>	<b>d3</b>
1	<ul> <li>Carbohydrates digestion and absorption</li> <li>Metabolism of mono and disaccharides</li> <li>Glycolysis (Reactions, steps and regulation)</li> </ul>	x	x	X					X			
2	<ul> <li>Gluconeogenesis (Reactions and regulation)</li> <li>Tricarboxylic acid cycle (Reactions, regulation and calculation of energy produced)</li> </ul>		x	X					х			
3	<ul><li>HMP shunt (Reactions and functions)</li><li>Uronic acid pathway (Reactions)</li></ul>		x						X			
4	<ul> <li>Glycogen metabolism</li> <li>Glycogenesis regulation</li> <li>Glycogenolysis regulation</li> </ul>		x	x					Х			
5	<ul> <li>Digestion and absorption of lipids</li> <li>Plasma lipids</li> <li>Oxidation of fatty acids</li> </ul>	x	x									
6	-Midterm exam	х	X	x					Х			
7	<ul> <li>- Lipogenesis</li> <li>- Lipolysis in adipose tissues.</li> <li>- Phospholipid metabolism</li> </ul>		X						X			
8	<ul> <li>Ketone bodies metabolism</li> <li>Self-learning activities (Diabetes – Glycogen storage diseases)</li> </ul>		X							х	X	x

9	<ul> <li>-Lipoproteins metabolism</li> <li>- Cholesterol metabolism</li> <li>- Self-learning activities (fatty liver)</li> </ul>		x				Х		x	x	x
10	<ul> <li>Protein turnover</li> <li>Digestion and absorption of dietary proteins.</li> <li>Nitrogen metabolism</li> <li>Transamination</li> </ul>	x	x								
11	<ul> <li>Deamination</li> <li>Transdeamination</li> <li>Metabolism of ammonia</li> <li>Urea cycle</li> <li>Self-learning activities (Growth formula, benefits and hazards)</li> </ul>		x					x	X	х	x
12	- Conversion of amino acids to specialized products							Х			
13	<ul> <li>Conversion of amino acids to specialized products (continue)</li> <li>Metabolic correlation associated with some diseases</li> </ul>							X			
14	-Revision	x	X	x			X	x			
15	-Final exam	x	x	X				X			
	Practical sessions										
1	- Laboratory safety measures				Х						
2	-Lipid metabolism -Lipid profile -Determination of triglycerides				X	x	х				
3	-Determination of cholesterol				X	x	х				
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	Х				

8	-Determination of serum uric acid level.		Х	X	x			
9	-Protein metabolism abnormalities case.			х	Х			
10	- Revision / Quiz			X	Х			
11	-Activity presentation					X	x	X
12	-Practical exam		x X	X	X			

				Matrix	II of Biocl	hemistr	y-2 cou	rse				
	National Academic	Program	Course	Course		Teachi	ing and le methods	<u> </u>	W	Veighting	of asse	ssment
	Reference Standards NARS	ILOs	ILOs	contents	Sources	Lecture	Practical session	Self learning	Written exam	Practical exam	Oral exam	Periodical exam
	Principles of basic,			- Carbohydrates digestion and absorption - Metabolism of mono and disaccharides - Glycolysis (Reactions, steps and regulation)	Student book Essential books	x			x		Х	Х
2.1	pharmaceutical, medical, social, behavioral, management, health and environmental	A4	al	<ul> <li>Digestion and absorption of lipids</li> <li>Plasma lipids</li> <li>Fat oxidation of fatty acids</li> </ul>	Student book Essential books	x			X		X	х
	sciences as well as pharmacy practice.			<ul> <li>Protein turnover</li> <li>Digestion and absorption of dietary proteins.</li> <li>Self-learning activities</li> </ul>	Student book Essential books	x			x		X	
				Revision	Student book Essential books	x			X		х	

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

		- Digestion and absorption of lipids Plasma lipids - Fat oxidation of fatty acids	Student book Essential books	X		X	X	X
	a3	<ul> <li>Lipogenesis</li> <li>Lipolysis in adipose tissues.</li> <li>Phospholipid metabolism</li> </ul>	Student book Essential books	x		x	x	Х
		<ul> <li>Ketone bodies metabolism</li> <li>Self-learning activities</li> <li>Periodical exam</li> </ul>	Student book Essential books	x		x	X	
		- Cholesterol metabolism and lipoproteins	Student book Essential books	x		x	Х	
		<ul> <li>Protein turnover</li> <li>Digestion and absorption of dietary proteins.</li> <li>Self-learning activities</li> </ul>	Student book Essential books	x		x	х	
		<ul> <li>Nitrogen metabolism</li> <li>Transamination</li> <li>Deamination</li> <li>Trasdeamination</li> </ul>	Student book Essential books Recommended books Internet	X	х	x	Х	

		- Metabolism of ammonia - Urea cycle - Self learning activities	Student book Essential books	x		х	х	
		- Conversion of amino acids to specialized products	Student book Essential books	x		х	X	
	A25	- Conversion of amino acids to specialized products (continue)	Student book Essential books	x		х	X	
		<ul> <li>Ketone bodies metabolism</li> <li>Self-learning activities</li> <li>Periodical exam</li> </ul>	Student book Essential books	X		X	Х	
		- Cholesterol metabolism and lipoproteins	Student book Essential books	х		х	X	
		- Metabolic correlation associated with some diseases	Student book Essential books	x		х	X	

3.2	Handle and dispose chemicals and pharmaceutical preparations safely.	В2	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	Student book Essential books	x		x		х	

				- Glycogenolysis regulation Digestion and 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	х	
5.5	Practice independent learning needed for continuous professional development.	D6	d3	Activity (report and presentations)	Recommended books Internet		х	x	
5.9	Implement writing and presentation skills	D10	d2	Activity (report and presentations)	Recommended books Internet		х	х	

# COURSE SPECIFICATIONS

Parasitology and Pathology

Third year – secondTerm 2018-2019

# **Course Specification of Parasitology and Pathology**

## **University:**

Faculty: Pharmacy

# A- Course specifications:

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

Major or Minor element of programmes:

Zagazig

Department offering the program:

Department offering the course:

Academic year/level:

Date of specification approval:

# **B- Basic information:**

Title: Parasitology and Pathology 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.

Microbiology Department third year/ Second term September 2018

Major

\_\_\_\_\_

Code: MI322

# **<u>2-Intended Learning Outcomes of Parasitology and</u>** <u>**Pathology Course (ILOs):**</u>

A- K	nowledge 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.
аб	Outline the laboratory diagnosis of diseases caused by different parasites.
B- Pr	ofessional 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- In	tellectual 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-G	eneral and Transferable skills
<b>d</b> 1	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	<ul> <li>Helminthology 2a-Trematodes:</li> <li>General characters</li> <li>Fasciola <i>s</i>pecies</li> <li>Short essay questions</li> </ul>	<ul> <li>Parasitological laboratory examination:</li> <li>Sample collection</li> <li>Evaluation of different techniques used in the diagnosis of parasitic infections:</li> <li>Microscopical</li> <li>Serology</li> <li>Modern molecular techniques (e.g. PCR)</li> </ul>
3	<ul> <li>Heterophyes species</li> <li>Schistosoma species</li> <li>Case report</li> </ul>	<ul> <li>Demonstration of microscopic slides of morphologic stages of:</li> <li>Fasciola species</li> <li>Heterophyes species</li> <li>Schistosoma species</li> <li>Demonstration of Snails hosts</li> </ul>
4	Cestodes: - General characters - Taenia saginata - Taenia solium - Cysticercosis Case report	<ul> <li>Demonstration of microscopic slides of morphologic stages of: Taenia saginata Taenia solium</li> </ul>
5	<ul> <li>Echinococcus sp.</li> <li>Hymenolepis sp.</li> <li>Diphyllobothrium sp.</li> <li>Nematodes:`</li> <li>General characters</li> <li>Ascaris lumbricoides</li> <li>Hook worm sp.</li> </ul>	<ul> <li>Demonstration of microscopic slides of morphologic stages of :</li> <li>Echinococcus sp.</li> <li>Ascaris lumbricoides</li> <li>Hook worm sp.</li> <li>Activity (poster preparation)</li> </ul>
6	<ul> <li>Enterobius &amp; Trichuris</li> <li>Trichinella spiralis</li> <li>Wuchereria species</li> <li>Case report</li> </ul>	<ul> <li>Demonstration of microscopic</li> <li>slides of morphologic stages of:</li> <li>Enterobius &amp; Trichuris</li> <li>Trichinella spiralis</li> <li>Wuchereria species</li> </ul>
7	Midterm exam	
8	<ul><li>Protozoology</li><li>Amoebae species</li><li>Balantidium coli</li></ul>	Demonstration of microscopic slides of morphologic stages of: - Amoebae species

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

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

## **<u>E- Teaching and Learning Methods:</u>**

- 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%

## **<u>G- Facilities Required for Teaching and Learning:</u>**

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

### **<u>H- List of References:</u>**

#### **A- Parasitology:**

 Student book of Parasitology and pathology-Lecture approved by Microbiology department & practical notes by staff of the department 2018.

#### 2- Essential Books:

i- Medical Parasitology (9<sup>th</sup> 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 (23<sup>rd</sup> 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

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

		M	atrix	x1 (	of P	ara	sito	logy	& P	atho	logy	7				
C	ourse content		Know	ledge	and				I essional	LOs   & Pra		Inte	llectu	Transferable &		
	Course content		Unde a2	rstan a3	ding a4	a5	d6	b1	ski b2	ills b3	b4	al s	kills c2	gen d1	eral ski d2	lls d3
1	General Introduction Practical General terms of parasitology	a1 x	a2	a.)	47	a		x			T			uı	u2	us
2	<u>-Helminthology</u> <u>a-Trematodes</u> <u>-General characters</u> <u>-Fasciola species</u> <u>- Practical</u> 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	<u>Heterophyes</u> - <u>Schistosoma</u> <u>Case report</u> <u><b>Practical</b></u> -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 <u>Practical</u> 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 <u>Practical</u> Demonstration of microscopic slides of : • Echinococcus sp. • Ascaris lumbricoides	x	X	X		X	x	X			X

	<ul><li>Hook worm sp.</li><li>Activity (report)</li></ul>										
6	<ul> <li>Enterobius &amp; Trichuris</li> <li>Trichinella spiralis</li> <li>Wuchereria species</li> <li>Case report</li> <li>Practical</li> <li>Demonstration of microscopic slides of</li> <li>Enterobius &amp; Trichuris</li> <li>Trichinella spiralis</li> <li>Wuchereria species</li> </ul>	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 <b>Practical</b> Leishmania species Trypanosoma species. morphologic stages of: Amoebae species <u>Balantidum coli</u> <u>Giardia lamblia</u>	x	X			X	X	X			

	Trichomonas vaginalis												
9	Plasmodium species Toxoplasma gondii Case study <u>Practical</u> 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 <u>Practical</u> Demonstration of computer Slide of signs of inflammation. Chronic Non specific		x		x		X	x			x	x	x

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

Matrix II of Parasitology & Pathology													
		Program	Course	Course		Teaching and learning methods			Method of assessment				
	NARS	ILOs	ILOs	contents	bour cos	lecture	practical session	Activity	written exam	practical exam	oral exam	Midterm exam	
	Principles of basic,		al	<ul> <li>General</li> <li>Introduction</li> <li>Helminthology</li> <li>2a-Trematodes:</li> <li>General characters</li> <li>Fasciola species</li> <li>Short essay</li> <li>questions</li> <li>Heterophyes species</li> <li>Schistosoma species</li> </ul>	Student book Essential books	x			x		x	х	
2.1	Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice.	A4	a2	Cestodes: General characters Taenia saginata Taenia solium Cysticercosis - Echinococcus sp. - Hymenolepis sp. - Diphyllobothriu m 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	A27	a4 a5	-Enterobius & Trichuris -Trichinella spiralis -Wuchereria species -Case report Protozoology -Amoebae species -Balantidium coli	Student book	×			×		x	×	Ĩ
	different diseases and their pharmacotherapeutic approaches.	A28 A29	a5 a6	-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	Essential books Student Notes Essential books	x	X	x	x	Х	x	X	

				-Evaluation of different techniques used in the diagnosis of parasitic infections: -Microscopical Serology Modern molecular techniques (e.g. PCR) General Pathology -Introduction	Practical notes Student	×	X	X	
3.5	Select medicines based on understanding etiology and path physiology of diseases.	B8	b2	-Inflammation -Healingand regeneration -Repair -Cell injury & cell death	notes Student notes and practical note	x	x	х	
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	-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)	Student notes and practical note	X	x	Х	

			Acutediffusesuppurativeinflammation(Cellulitis)Tuberculousgranulomaforeignbodygiantcell granulomaSerousInflammation(effusion)EdemaDemonstrationofcomputerSlideSlidesCoagulativenecrosisLiquefactivenecrosisGranulationtissueFattydegenerationIiverApoptosisAdenomaliverMeningioma					
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	Х	

4.9	Utilize the pharmacological basis of therapeutics in the proper selection and use of drugs in various disease conditions.	<mark>C14</mark>	cl	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 -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

5.1	Communicate clearly by	D1	d 1	-Balantidium coli -Giardia lamblia -Trichomonas vaginalis							
	verbal and means 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 2018-2019

# **Course specification of Medicinal Chemistry (2)**

Zagazig **University: 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: 26/11/2018 **B-Basic information:** Title: MC321 Code: MC321 Credit Hours: ---Lectures: 2 hrs/week Practical: 2 hr/week Tutorials: Total: 3 hrs/week

### **<u>C-Professional information:</u>**

### 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):

<b>A-</b>	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>B-</b> 2	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).
<b>C-</b>	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	Lecture contents	Practical session
No.	(2 hrs/lec.)	(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, $\alpha$ , $\beta$ 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

b1, b2, b3, c1, c2, d1, d2, d3

d1, d2, d3

- 2- Activity to assess
- 3- Practical exam to assess

to assess

4- Oral exam

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.

### **<u>G-Teaching and learning methods:</u>**

- 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 2018-2019.

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./ Abdulla A. El-shanawany

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

تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ Date: 26/11/2018

	Matrix I	of M	ledic	inal	che	mist	ry 2	cour	se			
	<b>Course Contents</b>		II	LOs o	f Me	dici	nal c	hemis	try 2 c	cours	se	
		Knowledge and understanding			Professional and practical skills			Intell	ectual ills	General and transferable skills		ble
	Lectures	a1	a2	a3	<b>b1</b>	<b>b2</b>	<b>b3</b>	c1	c2	<b>d1</b>	d2	<b>d3</b>
1	Antimycobacterium agents	X	Х	X								
2	Antineoplastic agents(Alkylating agents)	х	х	х								
3	Antineoplastic agents(Alkylating agents, antimetabolites)	х	х	х								
4	Antineoplastic agents( antimetabolites, hormones)	х	х	х								
5	Antiviral agents ( host cell penetration inhibitors and nucleic acid inhibitors)	Х	Х	Х								
	( host cell penetration inhibitors and nucleic acid inhibitors)											
6	Antiviral agents( protein inhibitors)	х	х	х								
7	Oral hypoglycemic ( sulfonylurea derivatives)	х	х	х					Х			
	( sulfonylurea derivatives)											
8	( sulfonylurea derivatives) Oral hypoglycemic ( biguanide	v	v	v								
0	derivatives) & diagnostic agents	х	х	х								
9	Antianginal agents & antiarryhthmic drugs	х	х	X								
10	Antihypertensive agents	X	x	X					х			
11	Anticoagulants & antihyperlipidemic agents	х	Х	Х								
12	Diuretics (water and osmotic agents, acidifying salts, mercurials, $\alpha$ , $\beta$ unsaturated ketones, purines, pyrimidines)	X	X	X								
13	Diuretics (sulfonamide derivatives and endocrine antagonists)	X	х	x					X			

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

			Matr	ix II of Medio	cinal Chen	nistry 2	2 course	!			
I	National Academic	Program ILOs	Course ILOs	Course contents	Sources	Teach	ing and method			lethods o ssessmen	
	Reference Standards (NARS)					lecture	practical session	Activity (Reports)	written exam	practical exam	oral exam
2.1	Principles of basic,	A2	a1	Antimycobacterium agents	Student book	Х			Х		х
	pharmaceutical, medical, social, behavioral,	armaceutical, edical, social, behavioral, nanagement,		Antineoplastic agents(Alkylating agents)	Student book	X			X		X
	management, health and environmental sciences as well			Antineoplastic agents(Alkylating agents, antimetabolites)	Student book	Х			X		X
	as pharmacy practice.			Antineoplastic agents( antimetabolites, hormones)	Student book Essential books	Х		X	Х		Х
				Antiviral agents ( host cell penetration inhibitors and nucleic acid inhibitors)	Student book	X			X		х
				Antiviral agents( protein inhibitors)	Student book	Х			х		Х
				Oral hypoglycemic ( sulfonylurea derivatives)	Student book	Х			Х		X
				(sulfonylurea derivatives)							

		1		1					1	
				( sulfonylurea derivatives) Oral hypoglycemic ( biguanide derivatives) &	Student book Essential books	X		X		x
				diagnostic agents Antianginal agents & antiarryhthmic drugs	Student book	X		X		x
				Antihypertensive agents	Student book	Х		X		x
				Anticoagulants & antihyperlipidemic agents	Student book Internet Recommended books	X	Х	X		x
				Diuretics ( water and osmotic agents, acidifying salts, mercurials, $\alpha$ , $\beta$ unsaturated ketones, purines, pyrimidines)	Student book Essential books	Х		X		х
				Diuretics ( sulfonamide derivatives and endocrine antagonists)	Student book	X		X		x
2.5	Principles of drug design,	A15	a2	Antimycobacterium agents	Student book	Х		Х		X
	development and synthesis.	t		Antineoplastic agents(Alkylating agents)	Student book	Х		Х		х
				Antineoplastic agents(Alkylating agents, antimetabolites)	Student book Internet Recommended books	Х	Х	Х		х

				1		1	
	Antineoplastic	Student book	Х			Х	Х
	agents(						
	antimetabolites,						
	hormones)						
	Antiviral agents (	Student book	х			Х	Х
	host cell						
	penetration						
	inhibitors and						
	nucleic acid						
	inhibitors)						
	Antiviral agents(	Student book	х			х	Х
	protein inhibitors)						
	I I I I I I I I I I I I I I I I I I I						
	Oral hypoglycemic	Student book	х			Х	Х
	( sulfonylurea						
	derivatives)						
	Oral hypoglycemic	Student book	Х			Х	Х
	( biguanide						
	derivatives) &						
	diagnostic agents						
	Antianginal agents	Student book	х			Х	Х
	& antiarryhthmic						
	drugs						
	Antihypertensive	Student book	X		Х	Х	Х
	agents	Internet					
	"Bound	Recommended					
		books					
	And some long to 9						
	Anticoagulants &	Student book	х			Х	Х
	antihyperlipidemic						
	agents						
	Diuretics (water	Student book	Х			Х	Х
	and osmotic agents,						
	acidifying salts,						
	mercurials, $\alpha, \beta$						
	unsaturated						
	ketones, purines,						

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

				Antianginal agents & antiarryhthmic drugs	Student book	Х			Х		х
				Antihypertensive agents	Student book	Х			Х		Х
				Anticoagulants & antihyperlipidemic agents	Student book Internet Recommended books	Х		Х	Х		х
				Diuretics ( water and osmotic agents, acidifying salts, mercurials, $\alpha$ , $\beta$ unsaturated ketones, purines, pyrimidines)	Student book	X			X		x
				Diuretics ( sulfonamide derivatives and endocrine antagonists)	Student book	Х			Х		х
3.2	Handle and dispose chemicals and pharmaceutical preparations safely	B2	ь1	Laboratory safety measures	Practical notes		X			Х	

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	C3	<u>c1</u>	Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide	Practical notes	Х		X	
	pharmacy practice			Identification of organic acids / salts,iron , zinc and magnesium salts, sulpha, boric acid, urea and hexamine of pharmaceutical use	practical notebook	Х		Χ	

4.3	Apply qualitative and quantitative analytical and biological methods for QC and assay of raw materials as well as	C7	c2	Oral hypoglycemic ( sulfonylurea derivatives)	Student book Internet Recommended books	X		X	X		Х
	pharmaceutical preparations			Quantitative estimation of boric acid, hexamine, hydrogen peroxide & tolbutamide	Practical notes		Х			Х	
				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		Х			X	
5.9	Implement writing and presentation	D10	d2	Activity	Internet Recommended books		Х	X		Х	

	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	х	x	x	