

# **COURSE SPECIFICATIONS**

## **Faculty of Pharmacy**

**Second level –Semester 3**  
**Bachelor of Pharmacy**  
**(Clinical Pharmacy Pharm D)**

**2020-2021**

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**COURSE  
SPECIFICATIONS**

**Pharmaceutical  
Organic ChemistryIII**

**Second level –Semester 3  
2020-2021**

## Course specification of Pharmaceutical Organic Chemistry-3

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University: Zagazig

Faculty: Pharmacy

### A- Course specifications:

Program on which the course is given: Bachelor of Pharmacy (clinical pharmacy Pharm D)

Major or Minor element of programs: Major

Department offering the program: -----

Department offering the course: Pharmaceutical Organic Chemistry

Academic year Level: level two / semester 3

Date of specification approval:

### B- Basic information:

Title: Code: PR 303

Credit Hours: ---

Lectures: 2hr/week

Practical: 1hr/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:

- Acquire the fundamental bases of stereochemistry of organic compounds and the chemistry of carbohydrates, their identification, and their application in pharmaceutical compounds.
- Identify the chemistry of aromatic heterocyclic compounds as well as their importance in synthesis of drugs (in pharmaceutical industry).
- Develop skills in terms of identification and synthesis of organic compounds including some drugs.

## 2- Key elements of pharmaceutical organic chemistry 3.

<b>DOMAIN 1- FUNDAMENTAL KNOWLEDGE</b>	
<b>1-1- COMPETENCY:</b> Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.	
1.C1.1.	<ul style="list-style-type: none"><li>• Illustrate the basic principles of stereochemistry of organic compounds as well as the application of stereochemistry in pharmaceutical compounds activity.</li></ul>
1.C1.2.	<ul style="list-style-type: none"><li>• Outline the chemistry of carbohydrates and their important chemical reactions.</li></ul>
1.C1.3.	<ul style="list-style-type: none"><li>• Identify chemical name and different synthetic pathways for pharmaceutical heterocyclic compounds including commercially available drugs.</li></ul>
<b>DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE</b>	
<b>2-2- COMPETENCY:</b> Standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines.	
2.C2.1.	<ul style="list-style-type: none"><li>• Synthesize different pharmaceutically active nuclei including pyrazole, benzotriazole, benzothiophene and quinoxalinone</li></ul>
2.C2.2.	<ul style="list-style-type: none"><li>• Perform identification tests for carbohydrates.</li></ul>
2.C2.3	<ul style="list-style-type: none"><li>• Perform Purification of different target compounds using the separation techniques.</li></ul>
2.C2.4.	<ul style="list-style-type: none"><li>• Interpret laboratory results effectively</li></ul>
<b>2-3- COMPETENCY:</b> Handle and dispose biologicals and synthetic/natural pharmaceutical materials /products effectively and safely with respect to relevant laws and legislations.	
2.C3.1	<ul style="list-style-type: none"><li>• Handle basic laboratory equipment and chemicals effectively and safely.</li></ul>
2.C3.2	<ul style="list-style-type: none"><li>• Apply GLP guidelines for safe handling and disposal of chemicals.</li></ul>
<b>DOMAIN 4: PERSONAL PRACTICE</b>	
<b>4-1- COMPETENCY:</b> Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.	
4.C1.1.	<ul style="list-style-type: none"><li>• Work effectively as a member of a team.</li></ul>
4.C1.2.	<ul style="list-style-type: none"><li>• Demonstrate problem solving skills.</li></ul>

## D- Contents:

<b>Week No.</b>	<b>Lecture contents (2hr/week)</b>	<b>Practical session (1hr/week)</b>
<b>1</b>	1- Stereochemistry *Definition, aim of study and classification *Structural isomerism	Lab. Safety
<b>2</b>	*Rotational isomerism *Geometrical isomerism	Identification of Carbohydrates Identification of glucose and fructose
<b>3</b>	Optical isomerism Activity (QUIZ)	Identification of Carbohydrates Identification of sucrose, lactose and starch
<b>4</b>	* D, L and Erythro, Threo Nomenclature *R and S, Enantiomers , Diastereomers * Activity (QUIZ)	Synthesis of fructosazone
<b>5</b>	2- Heterocyclic chemistry Nomenclature of heterocyclic & fused heterocyclic compounds	Synthesis of $\beta$ -penta-acetyl glucose
<b>6</b>	Five member ring Furan, Pyrrole&Thiophenesynthesis.	Synthesis of 3,5-dimethyl pyrazole
<b>7</b>	Midterm exam	Midterm exam
<b>8</b>	Five membered ring Furan, Pyrrole&Thiophene Reactions *Activity (Quiz)	Synthesis of 5-nitrosalicylic acid
<b>9</b>	Five membered ring with two nitrogens Pyrazole& Imidazole Synthesis & Properties	Synthesis of 3-methyl-1H-quinoxalin-2-one
<b>10</b>	Indole synthesis, reaction and serotonin (5HT)	Synthesis of 1,2,3-benzotriazole
<b>11</b>	Six-membered ring Pyridine and its derivatives, quinoline and isoquinoline. Synthesis & Reactions.	Synthesis of ethyl 2-amino-4,5,6,7-tetrahydrobenzo(b)thiophene-3-carboxylate
<b>12</b>	Six-membered ring with two nitrogens. Pyrimidine, Pyrazine&Pyridazine Synthesis & Properties, purine nucleus	Activity (Synthesis of certain drugs containing heterocycles)
<b>13</b>	3- Carbohydrates Introduction and Classification. Monosaccharides i. Synthesis ii.Cyclic structure of Monosaccharides iii.Chemical reactions of Monosaccharides Activity (case study on nomenclature of heterocycles)	Practical exam
<b>14</b>	Disaccharides i.Nomenclature ii. Chemical reactions of Disaccharides	

	*.Polysaccharides i.Nomenclature ii.Chemical reactions and determination of the type of glycosidic linkage. *Activity (quiz)	
<b>15</b>	Written exam	

### E- Teaching and Learning Methods:

- Lectures
- Practical session
- Group discussion
- Blended learning

### F- Student Assessment methods:

- Written exams **to assess:** 1.C1.1. ,1.C1.2, 1.C1.3.
- Practical exams **to assess:** 1.C1.2, 2.C2.1, 2.C2.2, 2.C2.3, 2.C3.1
- Oral exam **to assess:** 1.C1.1. ,1.C1.2,1.C1.3
- Activities within labs **to assess:** 4.C1.1, 4.C1.2
- **Assessment schedule**

<b>Assessment (1):</b> Written exams	Week 15
<b>Assessment (2):</b> Practical exams	Week 13
<b>Assessment (3):</b> Oral exams	Week 15
<b>Assessment (4):</b> Activity	participation each lab
<b>Assessment (5):</b> Periodical exams	Week 7

### Weighting of Assessment

Assessment method	Marks	Percentage
Periodic exam	10	10%
Final written exam	50	50%
Activity	5	5%
Practical practice & exam	25	25%
Oral exam	10	10%
<b>TOTAL</b>	100	100%

### G- Facilities required for teaching and learning:

- **For lectures:** White boards, data show.

**For Labs:** Chemicals, glassware, instruments, Digital balances, water bathes

## **H- List of References:**

**1- Course Notes:** Student book of Pharmaceutical Organic Chemistry approved by

Pharmaceutical Organic Chemistry Department 2020-2021

### **2- Essential Books:**

1- Sonia Ratnani, Shrinivas Gurjar, Abha Kathuria “Comprehensive Stereochemistry” Medtech; 1st edition, 2018.

2- Hellwich, Karl-Heinz, Siebert, Carsten, Stereochemistry workbook, problems & solution 2006.

3- John A. Joule & Viktor V. “Handbook of Heterocyclic Chemistry”, 3rd edition, 2010.

4- John A. Joule, “Heterocyclic Chemistry” 5th edition, 2010

### **3- Recommended Books**

\*Rainani, Sonia “Comprehensive Stereochemistry” 2018

\*John A. Joule, “Heterocyclic Chemistry” 5th edition, 2010

\*Topics in stereochemistry N.L. Allinger, E.L. Eliel & S.H. Wilen volume 14 Copyright 2000

\*Experimental Organic Chemistry Daniel R. Palleros 2000

### **4- Periodicals and websites:**

<https://www.ekb.eg/>

<http://chemwiki.ucdavis.edu/>

[www.Pubmed.Com](http://www.Pubmed.Com)

[www.sciencedirect.com](http://www.sciencedirect.com)

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**Course Coordinator: Prof. Dr. Eatedal Hassan AbdEl-aal**

**Head of Department: Prof. Dr. Hanan Abdel-Razek**

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





## Matrix I of Pharmaceutical organic Chemistry-3

<b>Course Contents</b>	<b>Key elements of Pharmaceutical organic Chemistry-3</b>											
	1-1- COMPETENCY			2-2- COMPETENCY				2-3- COMPETENCY		4-1- COMPETENCY		
	1.C1.1	1.C1.2	1.C1.3	2.C2.1	2.C2.2	2.C2.3	2.C2.4	2.C3.1	2.C3.2	4.C1.1	4.C1.2	
<b>Lectures</b>												
1- Stereochemistry *Definition, aim of study and classification *Structural isomerism	X											
*Rotational isomerism *Geometrical isomerism	X											
Optical isomerism Activity (QUIZ)	X											
* D, L and Erythro, Threo Nomenclature *R and S, Enantiomers , Diastereomers * Activity (QUIZ)	x											
2- Heterocyclic chemistry Nomenclature of heterocyclic & fused heterocyclic compounds			X									
Five member ring Furan, Pyrrole&Thiophenesynthesis.			X									
Five membered ring Furan, Pyrrole&Thiophene Reactions *Activity (Quiz)			X									
Five membered ring with two nitrogens Pyrazole& Imidazole Synthesis & Properties			X									
Indole synthesis, reaction and serotonin (5HT)			X									
Six-membered ring Pyridine and its derivatives, quinoline and			x									

isoquinoline.x Synthesis & Reactions.														
Six-membered ring with two nitrogens. Pyrimidine, Pyrazine&Pyridazine Synthesis & Properties, purine nucleus			X											
3- Carbohydrates Introduction and Classification. Monosaccharides i. Synthesis ii.Cyclic structure of Monosaccharides iii.Chemical reactions of Monosaccharides Activity (case study on nomenclature of heterocycles)			X											
Disaccharides i.Nomenclature ii. Chemical reactions of Disaccharides *.Polysaccharides i.Nomenclature ii.Chemical reactions and determination of the type of glycosidic linkage. *Activity (quiz)			X											
Lab. Safety								X	X	X			X	
Identification of Carbohydrates Identification of glucose and fructose					X	X	X	X	X	X			X	
Identification of Carbohydrates Identification of sucrose, lactose and starch					X	X	x	X	X	X			X	
Synthesis of fructosazone				X		X	X	X	X	X			X	
Synthesis of $\beta$ -penta-acetyl glucose				X		X	x	X	X	X			X	
<b>Synthesis of 3,5-dimethyl pyrazole</b>				X		X	X	X	x	X			X	

Synthesis of 5-nitrosalicylic acid				X		X	X	X	X	X		X	
Synthesis of 3-methyl-1H-quinoxalin-2-one				X		X	X	X	X	X		X	
Synthesis of 1,2,3-benzotriazole				X		X	X	X	X	X		X	
Synthesis of ethyl 2-amino-4,5,6,7-tetrahydrobenzo(b)thiophene-3-carboxylate				X		X	x	X	x	X		x	
Activity (Synthesis of certain drugs containing heterocycles)										x	x	x	x



### Matrix II of Pharmaceutical organic chemistry-3

National Academic Reference Standards NARS		Program key elements	Course key elements	Course contents	Sources	Teaching and learning methods			Weighting of assessment			
						lecture	practical session	self learning	written exam	practical exam	oral exam	Midterm exam
<b>1.1.1</b>	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.1	1.C1.1 1.C1.2 1.C1.3	1- Stereochemistry *Definition, aim of study and classification *Structural isomerism *Rotational isomerism *Geometrical isomerism Optical isomerism Activity (QUIZ) * D, L and Erythro, Threo Nomenclature *R and S, Enantiomers, Diastereomers * Activity (QUIZ) 2- Heterocyclic chemistry Nomenclature of heterocyclic & fused heterocyclic compounds Five member ring Furan, Pyrrole&Thiophenes ynthesis. Five membered ring Furan,	Student book Essential books Recommended books	<b>X</b>			<b>X</b>		<b>X</b>	<b>X</b>

			<p>Pyrrole&amp;Thiophene Reactions  *Activity (Quiz)  Five membered ring with two nitrogens  Pyrazole&amp; Imidazole Synthesis &amp; Properties  Indole synthesis, reaction and serotonin (5HT)  Six-membered ring Pyridine and its derivatives, quinoline and isoquinoline. Synthesis &amp; Reactions.  Six-membered ring with two nitrogens. Pyrimidine, Pyrazine&amp;Pyridazine Synthesis &amp; Properties, purine nucleus  3- Carbohydrates Introduction and Classification. Monosaccharides  i. Synthesis  ii.Cyclic structure of Monosaccharides  iii.Chemical reactions of Monosaccharides  Activity (case study on nomenclature of heterocycles)  Disaccharides  i.Nomenclature  ii. Chemical reactions of</p>								
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				Disaccharides * Polysaccharides i. Nomenclature ii. Chemical reactions and determination of the type of glycosidic linkage. * Activity (quiz)								
2.2.1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/ natural pharmaceutical materials.	2.C2.1.	2.C2.1 2.C2.2 2.C2.3 2.C2.4	Lab. Safety Identification of Carbohydrates Identification of glucose and fructose Identification of Carbohydrates Identification of sucrose, lactose and starch	Student book Essential books Recommended books Practical note		X				X	
2.2.3	Recognize the principles of various tools and instruments, and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.	2.C2.8	2.C2.1	Synthesis of fructosazone Synthesis of $\beta$ -penta-acetyl glucose Synthesis of 3,5-dimethyl pyrazole Midterm exam Synthesis of 5-nitrosalicylic acid Synthesis of 3-methyl-1H-quinoxalin-2-one Synthesis of 1,2,3-benzotriazole Synthesis of ethyl 2-amino-4,5,6,7-tetrahydrobenzo(b)thiophene-3-carboxylate				X			X	
2.3.1	Handle, identify, and dispose biologicals, synthetic/natural	2.C3.1.	2.C3.1	Activity (Synthesis of certain drugs containing heterocycles)	Practical notes		X				X	



	materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field.		
<b>2.3.2</b>	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.	2.C3.2	2.C3.2
<b>4.1.1</b>	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills..	4.C1.1	4.C1.1

Practical notes		X			X		
Practical notebook		X			X		

**4.1.2**  
Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.

4.C1.5

4.C1.2





**COURSE  
SPECIFICATIONS**

**Biochemistry I  
Second level –Semester 3  
2020-2021**

# Course specification of Biochemistry 1

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University: Zagazig

Faculty: Pharmacy

## A- Course specifications:

Program (s) on which the course is given: Bachelor of Pharmacy (Clinical Pharmacy Pharm D).

Major or Minor element of programs: Major

Department offering the program: -----

Department offering the course: Biochemistry Department

Academic year Level: level 2 / semester 3

Date of specification approval:

## B- Basic information:

Title: Biochemistry 1 Code: PB 302

Credit Hours:

Lectures: 2hrs/week

Practical: 1hr/week

Tutorials: ---

Total: 3hrs/week

## C- Professional information:

### 1-Overall aim of the course

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

- Illustrate chemistry and functions of carbohydrate, lipids, proteins, Enzymes and cellular organelles.
- Outline the principles of bioenergetics, oxidative phosphorylation, porphyrin and nucleotides metabolic pathways.
- Also, students will be able to Perform laboratory tests for biological samples and to interpret of laboratory results for diagnosis of diseases.

### 2- Key elements of Biochemistry 1

<b>DOMAIN 1- FUNDAMENTAL KNOWLEDGE</b>	
<b>1-1- COMPETENCY:</b> Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centred care.	
1.C1.1	Explain the principles of Biochemistry including electron transport chain and oxidative phosphorylation, enzymes and their mode of action, chemistry and functions of carbohydrates, lipids, proteins and nucleic acid including DNA.
1.C1.2	Describe synthesis and degradation of hemoglobin and the associated disorders
<b>DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE</b>	
<b>2-3- COMPETENCY</b> Handle and dispose biologicals and synthetic/natural pharmaceutical materials/products effectively and safely with respect to relevant laws and legislations.	
2.C3.1.	Handle basic laboratory equipment and chemicals effectively and safely
2.C3.2	Apply GLP guidelines for safe handling and disposal of chemicals
<b>DOMAIN 3: PHARMACEUTICAL CARE</b>	
<b>3-1- COMPETENCY</b> Apply the principles of body functions to participate in improving health care services using evidence-based data.	
3.C1.1	Perform Qualitative tests to identify different types of proteins and lipids.
3.C1.2	Select the appropriate method for differentiation between different classes of carbohydrates and fatty acids
3.C1.3	assess different methods used for determination of heme disorders
3.C1.4	Analyze and interpret quantitative data of laboratory results in a suitable form.
<b>DOMAIN 4: PERSONAL PRACTICE</b>	
<b>4-1- COMPETENCY</b> Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.	
4.C1.1	Develop time management skills

## D-Contents

WeekNo.	Lecture contents (2 hrs/lec.)	Practical session (1hr/lab)
1	- Biological oxidation. - Substrate level phosphorylation -Oxidative phosphorylation.	-Laboratory Safety -Measures
2	- Electron transport chain -Uncouplers - Energy gain from glucose oxidation in cells.	-Introduction about practical biochemistry.
3	-Enzymes structure -Properties of enzymes - Enzymes: mechanism of actions and coenzymes	- Separation of serum and plasma.
4	- Factors affecting reaction velocity - Inhibition of enzyme activity - Regulation of enzyme activity	- <b>Activity-1</b> (Vegetarian diet)
5	- Correlation of enzymes with diseases	- <b>Activity-2</b> ( <u>Importance of plasma protein, Creatine, Glutathione</u> )
6	- Chemistry of heme	Diabetes.
7	- Periodical exam	- Periodical exam
8	-Regulation of heme metabolism and metabolic disorders.	Diabetes.
9	- Structure and classification of amino acids - Acidic and basic properties of amino acids - Structure of proteins - Functions of proteins	Qualitative tests for proteins

	- Plasma proteins	
10	-Definition and function of lipids - Classification of lipids Distribution of lipids in the body - Types of fatty acids and essential fatty acids.	Qualitative tests for lipids.
11	Definition and functions of carbohydrates.	-Quantitative determination of serum glucose
12	Classification of carbohydrates (monosaccharides, disaccharides, oligosaccharides examples with structure).	<b>Practical exam 1</b>
13	Polysaccharides: examples and classification - Physical and chemical properties of carbohydrates.	<b>Practical exam 2</b>
14	Chemistry of nucleic acid	
15	Final exam	

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

- Lectures
- Laboratory sessions
- Think/pair/share
- Research project (Students are asked prepare a report& presentation about Vegetarian diet &Importance of plasma protein, Creatine, Glutathione)
- Role play
- Blended learning

### **F- Student Assessment methods:**

- 1- Written and periodical exams to assess: 1.C1.1, 1.C1.2, 3.C1.2, 3.C1.1
- 2- Practical exams to assess: 2.C3.1, 2.C3.2, 3.C1.1, 3.C1.4
- 3- Activities to assess: 4.C1.1



4- Oral exam to assess: 1.C1.1, 1.C1.2, 3.C1.2, 3.C1.1

### Assessment schedule

Assessment (1): Activity	Week 4, 5
Assessment (2): Periodical exam	Week 7
Assessment (3): Practical exam	Week 12, 13
Assessment (4): Written exam	Week 15
Assessment (5): Oral exam	Week 15

### Weighting of Assessment

Assessment method	Marks	Percentage
Activity	5	5%
Periodical exam	10	10%
Practical exam	25	25%
Written exam	50	50%
Oral exam	10	10%
<b>TOTAL</b>	<b>100</b>	<b>100%</b>

### G- Facilities required for teaching and learning:

- Black (white) board, Data show, Laboratory equipment (spectrophotometer, centrifuge) and Chemicals.

### H- List of References:

**1- Course Notes:** Student book of Biochemistry (1) approved by biochemistry department (2020).

- Practical notes of Biochemistry (1) approved by biochemistry department (2020).

### 2- Essential books:

**Essential books:**

- Marks' basic medical biochemistry: a clinical approach(third edition); Lieberman M., MarksA.D., Smith C.M. (2008).
- Lehninger principles of biochemistry (seventh edition); NelsonD.L., CoxM.M.,FreemanW.H. (2017).
- Lippincott'sIllustratedReviews:Biochemistry (Seventh edition); FerrierD.R. (2017)
- Marks' basic medical biochemistry: a clinical approach (fifth edition); Lieberman M., Marks A.D., Peet MD, Alisa. (2017).

### **3- Recommended books:**

- i- Biochemistry (seventh edition); Garrett R.H. and Grisham C.M.; Thomson learning, Inc (2017).
- ii- Harper's Illustrated Biochemistry (31<sup>th</sup> edition); Murray R.K., Bender D.A., Botham K.M., Kennelly P.J., Rodwell V.W., Weil P.A.; The Mc Graw Hill companies Inc. (2018).

### **4- Periodicals and websites:**

Egyptian J. of biochem. and molecular biology.

Egyptian J. of Pharmaceutical sciences.

Arab J. of Laboratory Medicine,

J. of Cardiovascular diseases.

[www.Pubmed.Com](http://www.Pubmed.Com)

[www.sciencedirect.com](http://www.sciencedirect.com).

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**Course coordinators:** Prof. Dr. Sousou Ibrahim

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



## Matrix I of Biochemistry 1 course 2020-2021

Course Contents		Key elements of Biochemistry 1 course								
		FUNDAMENTAL KNOWLEDGE		PROFESSIONAL AND ETHICAL PRACTICE		PHARMACEUTICAL CARE			PERSONAL PRACTICE	
Lectures		1.C.1.1	1.C.1.2	2.C.3.1	2.C3.2	3.C.1.1	3.C1.2	3.C1.3	3.C1.4	4.C.1.1
<b>1</b>	- Biological oxidation. - Substrate level phosphorylation - Oxidative phosphorylation	X								
<b>2</b>	- Electron transport chain -Uncouplers - Energy gain from glucose oxidation in cells.	x								
<b>3</b>	Mechanism of action of enzymes- coenzymes- factors affecting reaction velocity	X				x				
<b>4</b>	Inhibition of enzyme activity and regulation	x								
<b>5</b>	Correlation of enzymes with disease- Functions and classification of carbohydrates	X								
<b>6</b>	Classification of polysaccharides- physical and chemical properties of carbohydrates	X							x	
<b>7</b>	Structure and classification of amino acids - acidic and basic properties of amino acids	X								
<b>8</b>	Structure of proteins									

		X							
9	Functions of proteins- plasma proteins- functions and classification of lipids	X							
10	Distribution of lipids in the body- types of fatty acids	X							
11	Chemistry of porphyrins		x						
12	Metabolism of porphyrins and related diseases.		x				x		
13	Revision- open discussion								X
<b>Practical sessions</b>									
14	Laboratory safety measures			x	X				
15	Introduction about biochemistry			x	X				
16	Separation of serum and plasma			X	X	x			
17	Qualitative tests for lipids			X	X	x			
18	Qualitative tests for proteins.			X	X	x			
19	Quantitative determination of serum glucose.			X	x	x	x		
20	Activity								X



## Matrix II of Biochemistry 1 course 2020-2021

National Academic Reference Standards NARS		Program key elements	Course key elements	Course contents	Sources	Teaching and learning methods			Method of assessment		
						Lecture	Practical session	Self-learning	Written & oral exam	Practical exam	Periodical exam
<b>1-1</b>	Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-	1.C.1.3	1.C.1.1	- Electron transport chain -Uncouplers - Energy gain from glucose oxidation in cells .	Student book	X			X		X
				Oxidative phosphorylation	Student book Essential books	X			X		X
				Enzyme structure-enzyme properties	Student book	X			X		X
				Mechanism of action of enzymes-coenzymes-factors affecting reaction velocity	Student book Essential books Internet	x		x	X		X

centered care.

Inhibition of enzyme activity and regulation	Student book Essential books	X			X		X
Correlation of enzymes with disease	Student book Essential books	X			X		X
Classification of carbohydrates	Student book	X			X		
Classification of polysaccharides-physical and chemical properties of carbohydrates	Student book	X			X		
Structure and classification of amino acids - acidic and basic properties of amino acids	Student book	X			X		
Structure of proteins	Student book	X			X		
Types of fatty acids	Student book	X			X		
Classification of lipids	Student book	x			X		
Correlation of enzymes with disease	Student book Essential books	X			X		
Functions of proteins and plasma proteins	Student book	X			X		
Distribution of lipids in the	Student book	X			X		



				body								
			1.C.1.2	Chemistry of porphyrins	Student book	X			X			
				Metabolism of porphyrins and related diseases.	Student book Essential books	X			X			
				Metabolism of porphyrins and related diseases.	Student book Essential books	X			X			
2-3	Handle and dispose biologicals and synthetic/natural pharmaceutical materials/products effectively and safely with respect to relevant laws and legislations.	2.C.3.1 2.C3.2	2.C.3.1	Laboratory safety measures	Practical notes		x			x		
			2.C3.2									
			3.C1.1	Qualitative tests for proteins	Practical notes		x				x	
			3.C1.2	Qualitative tests for lipids	Practical notes		x				x	
			3.C1.3	Quantitative determination of blood glucose	Practical notes		x				x	
			3.C1.4									

3.1.1	Apply the principles of body functions to participate in improving health care services using evidence-based data.	3.C.1.1	Qualitative tests for proteins	Practical notes		x			x	
			Qualitative tests for lipids	Practical notes		x			x	
			Separation of plasma and serum						x	
			Quantitative determination of blood glucose	Practical notes		x				
3.1.3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.4	Classification of polysaccharides-physical and chemical properties of carbohydrates	Student book	X			X		x
4-1	Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and	4.C.1.3	4.C.1.1	Activity	Internet Recommended books		x	x		x
				Activity	Internet Recommended books		x	x		x

	entrepreneurial skills.			Activity	Internet Recommended books			x		x	
				Activity	Internet Recommended books			x		x	
				Revision- Open discussion	Student book Internet Recommended books	X		x			x
				Activity	Internet Recommended books		x	x		x	

**Course Coordinator: Prof. Dr. Sousou Ibrahim**

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





**COURSE  
SPECIFICATIONS**

**Pharmacognosy II**

**Second level –Semester 3  
2020-2021**

## Course specification of Pharmacognosy 2

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University: Zagazig

Faculty: Pharmacy

### A- Course specifications:

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

Major or Minor element of programs: Major

Department offering the program: -----

Department offering the course: Pharmacognosy Department

Academic year level: Second level/ semester 3

Date of specification approval: September 2020

### B- Basic information:

Title: Pharmacognosy 2 Code: PG 303

Credit Hours: ---

Lectures: 2hrs/week

Practical: 1hr/week

Tutorials: ---

Total: 3 hrs/week

### C- Professional information:

#### 1-Overall aim of the course

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

- Describe morphological, histological characters of medicinal fruits, herbs, subterranean organs, unorganized plant, animal and marine drugs.
- Identify active constituents, uses, chemical tests and adulteration of the studied drugs.
- Differentiate between drugs in entire and powdered form.

#### 2- Key elements of Pharmacognosy 2

<b>DOMAIN 1- FUNDAMENTAL KNOWLEDGE</b>	
<b>1-1- COMPETENCY:</b> Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.	
<b>1.C1.1.</b>	Describe morphological and histological characters and uses of medicinal fruits, herbs, subterranean organs, unorganized plant, animal and marine drugs.
<b>1.C1.2.</b>	Outline adulteration of different medicinal fruits, herbs, subterranean organs, unorganized plant and animal drugs.
<b>1.C1.3.</b>	Mention different active constituents of fruits, herbs, subterranean organs, unorganized plant, animal and marine drugs.
<b>DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE</b>	
<b>2-2- COMPETENCY:</b> Standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines.	
<b>2.C2.1.</b>	Handle microscope efficiently and design protocols to examine medicinal plants.
<b>2.C2.2.</b>	Examine drugs of plant origin in entire and powdered form.
<b>2.C2.3.</b>	Determine the active constituents of the studied drugs.
<b>2-3- COMPETENCY</b> Handle and dispose biologicals and synthetic/natural pharmaceutical materials /products effectively and safely with respect to relevant laws and legislations.	
<b>2.C3.1</b>	Handle and dispose chemicals safely
<b>DOMAIN 4: PERSONAL PRACTICE</b>	
<b>4-1- COMPETENCY</b> Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.	
<b>4.C1.1.</b>	Work effectively as part of a team.
<b>4.C1.2.</b>	Manage time and plan for work.
<b>4-2- COMPETENCY:</b> Effectively communicate verbally, non-verbally and in writing with individuals and communities.	
<b>4.C2.1</b>	Write and present reports

## **D- Contents:**

<b>Week No.</b>	<b>Lecture contents (2hr/week)</b>	<b>Practical session (1hr/week)</b>
<b>1</b>	Introduction to fruits.	-Morphology of some important fruits.
<b>2</b>	Anise, fennel and caraway: macro-and micro morphology -, powder and chemical identification	Fennel: macro-and micro-morphology, powder and chemical identification.
<b>3</b>	Ammi visnaga, Ammi majus and Capsicum: macro-and; micro-morphology - powder and chemical identification.	Anise: macro-and micro-morphology, powder and chemical identification.
<b>4</b>	-Lemon and orange peel and other important medicinally used fruits: macro-and; micro-morphology - powder and chemical identification.	Ammi visnaga and Capsicum: macro-and micro-morphology, powder and chemical identification.
<b>5</b>	-Introduction to the herbs	-Morphology of some important herbs <b>-Activity:</b> Net research about macro-and; micro-morphology - powder and chemical identification, active constituents and uses of some selected fruits .
<b>6</b>	-Official herbs	Mentha: macro-and micro-morphology, powder and chemical identification.
<b>7</b>	-Non-official herbs <b>-Periodical exam.</b>	Thyme and vinca: macro-and micro-morphology, powder and chemical identification.
<b>8</b>	-Introduction to subterranean organs.	-Morphology of some important subterranean organs. <b>-Activity:</b> Net research about macro-and; micro-morphology - powder and chemical identification, active constituents and uses of some selected herbs.
<b>9</b>	Liquorice and Ipeca: macro-morphology; micro-morphology powder and chemical identification.	Liquorice: macro-morphology; micro-morphology powder and chemical identification
<b>10</b>	Ginseng, ginger, curcuma and garlic: macro-morphology; micro-morphology powder and chemical identification.	Ginger: macro-morphology; micro-morphology powder and chemical identification
<b>11</b>	-Introduction to Unorganized drugs -Medicinal plants used as unorganized drugs	Identification of unorganized drugs
<b>12</b>	-Introduction to animal drugs -Medicinal plants used as animal drugs.	<b>Practical exam</b>
<b>13</b>	-Drugs from marine.	<b>Practical exam</b>
<b>14</b>	Revision	
<b>15</b>	<b>Final written exam</b>	



## E- Teaching and Learning Methods:

- Lectures
- Practical sessions
- Self-learning (group discussion, presentation skills)
- Net research
- Blended learning

## F- Student Assessment methods:

1- Written exams to assess: 1.C1.1, 1.C1.2, 1.C1.3

2- Activity to assess: 4.C.1, 4.C1.2, 4.C2.1

3- Practical exams to assess: 2.C2.1, 2.C2.2, 2.C2.3, 2.C3.1

4- Oral exam to assess: 1.C1.1, 1.C1.2, 1.C1.3

### Assessment schedule

<b>Assessment (1):</b> Periodic exam	Week 7
<b>Assessment (2):</b> Activity	Week 5, 8
<b>Assessment (3):</b> Practical exam	Week 12, 13
<b>Assessment (4):</b> Final written exam	Week 15
<b>Assessment (5):</b> Oral exams	Week 15

### Weighting of Assessment:

Assessment method	Marks	Percentage
Periodic exam	10	10%
Practical exam	25	25%
activity	5	5%
Final written exam	50	50%
Oral exam	10	10%
<b>TOTAL</b>	100	100%

## G- Facilities Required for Teaching and Learning:

- For lectures: Black (white) boards, data show.
- For Labs: Chemicals, glassware, microscopes
- Farm of Faculty of Pharmacy.

## H- List of References:

**1- Course Notes:** Student book of Pharmacognosy -2 approved by pharmacognosy department.

**2- Essential books**

- Michael H., Joanne B., Jose P. G., Simon G., Elizabeth M. W. (Fundamentals of Pharmacognosy and Phytotherapy), 3<sup>rd</sup> Ed., Elsevier, 2018.
- Trease G.E. (a text book of pharmacognosy) 16<sup>th</sup> Ed. London., New York 2017.

### **3- Recommended books:**

- Simone B., M. C., Rupika D. (Pharmacognosy: Fundamentals, Applications and Strategies), 1st Ed, Academic Press, 2016.
- Biren S. (Textbook of Pharmacognosy & Phytochemistry), Elsevier, India, 2013.

### **4- Periodicals and websites:**

- A. Fahan, Plant Anatomy, Pergamon Press. 2002.
- <http://www.scribd.com/doc/75980088/Atlas-of-Medicinal-Plants-II>
- <http://pharmacystudent-prep.blogspot.com>
- <http://www.pharma-board.com/board/fopgal/index.php>

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**Course Coordinator: Prof. Dr. Afaf El-Sayed**

**Head of Department:**

**Date:** 9/2020 تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ



## Matrix I of Pharmacognosy 2 course

Course Contents		Key elements of Pharmacognosy 2 course									
		1-1- COMPETENCY			2-2- COMPETENCY			3-1 COM PETE NCY	4-1- COMPETENCY		4-2- COMPETENCY
Lectures		1.C1 .1	1.C1 .2	1.C1 .3	2.C2 .1	2.C2 .2	2.C2 .3	3.C1.1	4.C1.1	4.C1.2	4.C2.1
1	Introduction to fruits.	x	x	x							
2	Anise, fennel and caraway: macro-and; micro morphology -, powder and chemical identification	x	x	x							
3	Ammi visnaga, Ammi majus and Capsicum: macro-and; micro-morphology - powder and chemical identification.	x	x	x							
4	-Lemon and orange peel and other important medicinally used fruits: macro-and; micro-morphology - powder and chemical identification.	x	x	x							
5	-Introduction to the herbs	x	x	x							
6	-Official herbs	x	x	x							
7	-Non-official herbs <b>-Periodical exam.</b>	x	x	x							
8	-Introduction to subterranean organs.	x	x	x							
9	Liquorice and Ipeca: macro-morphology; micro-morphology powder and chemical identification.	x	x	x							
10	Ginseng, ginger, curcuma and garlic: macro-morphology; micro-morphology powder and chemical identification.	x	x	x							
11	-Introduction to Unorganized drugs -Medicinal plants used as unorganized drugs	x	x	x							
12	-Introduction to animal drugs	x	x	x							

	-Medicinal plants used as animal drugs.										
13	-Drugs from marine.	x	x	x							
<b>Practical session</b>											
1	-Morphology of some important fruits					x				X	
2	Fennel: macro-and micro-morphology, powder and chemical identification.				x	x	x			X	
3	Anise: macro-and micro-morphology, powder and chemical identification.				x	x	x			x	
4	Ammi visnaga and Capsicum: macro-and micro-morphology, powder and chemical identification.-					x		x	x	x	x
5	Morphology of some important herbs. <b>-Activity:</b> Net research about macro-and; micro-morphology - powder and chemical identification, active constituents and uses of some selected fruits				x	x	x			X	
6	Mentha : macro-and micro-morphology, powder and chemical identification.				x	x	x			X	
7	Thyme and vinca: macro-and micro-morphology, powder and chemical identification.				x	x	x			X	
8	-Morphology of some important subterranean organs. <b>-Activity:</b> Net research about macro-and; micro-morphology - powder and chemical identification, active constituents and uses of some selected herbs.					x		x	x	x	x
9	Liquorice: macro-morphology; micro-morphology powder and chemical identification				x	x	x			X	
10	Ginger: macro-morphology; micro-morphology powder and chemical identification				x	x	x			X	
11	Identification of unorganized drugs				x	x	x			x	



## Matrix II of Pharmacognosy 2 course

National Academic Reference  Standards NARS		Program key elements	Course key elements	Course contents	Sources	Teaching and learning methods			Weighting of assessment			
						lecture	practical session	case study/ think-pair-share self learning	written exam	practical exam & activity	oral exam	Midterm exam
1-1-1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences	1.C1.2.	1.C1.1	-Introduction to the herbs	Student book Essential books	x			x	x	x	
1-1-3	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/natural pharmaceutical materials/products.	1.C1.9.	1.C1.2	-Official herbs								
			1.C1.3	-Non-official herbs -Introduction to fruits. -Anise, fennel and caraway: macro-and; micro morphology -, powder and chemical identification - Ammi visnaga, Ammi majus and Capsicum: macro-and; micro-morphology - powder and chemical identification. -Lemon and orange peel and other important medicinally used fruits: macro-and; micro-morphology -								

<p><b>2-2-1</b> Isolate, design, identify, synthesize, purify, analyze, and standardize</p>	<p>2.C2.1.</p>	<p>powder and chemical identification.          -Introduction to subterranean organs.          - Liquorice and Ipeca: macro-morphology; micro-morphology powder and chemical identification.          -Ginseng, ginger, curcuma and garlic: macro-morphology; micro-morphology powder and chemical identification.          -Introduction to Unorganized drugs          -Medicinal plants used as unorganized drugs          -Introduction to animal drugs          -Medicinal plants used as animal drugs.          -Drugs from marine.</p>								
		<p>2.C2.1 -Morphology of some important herbs.          2.C2.2 - Mentha: macro- and micro-morphology, powder and chemical identification.          2.C2.3 - Thyme and vinca:</p>	<p>Practical notes</p>	<p>x</p>	<p>x</p>					



<p style="text-align: center;"><b>2.3.1</b></p>	<p>synthetic/ natural pharmaceutical materials.</p> <p>Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field</p>	<p>2.C3.1</p>	<p>2.C3.1</p>	<p>macro- and micro-morphology, powder and chemical identification.</p> <ul style="list-style-type: none"> <li>- Morphology of some important fruits.</li> <li>- Anise: macro- and micro-morphology, powder and chemical identification.</li> <li>- Fennel: macro- and micro-morphology, powder and chemical identification.</li> </ul> <p>Ammi visnaga and Capsicum: macro- and micro-morphology, powder and chemical identification</p> <ul style="list-style-type: none"> <li>- Morphology of some important subterranean organs.</li> <li>- Liquorice: macro-morphology; micro-morphology powder and chemical identification</li> <li>- Ginger: macro-morphology; micro-morphology powder and chemical identification</li> <li>- Identification of unorganized drug</li> </ul>								
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4.1.1.	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.C1.1	4.C1.1	Net research about macro-and; micro-morphology - powder and chemical identification, active constituents and uses of some selected herbs and fruits.								
		4.C1.3	4.C1.2									

**Course Coordinator: Prof. Dr. Afaf El-Sayed**

**Head of Department:**

**Date: 9/2020** تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ





**COURSE  
SPECIFICATIONS**

**Biophysics**

**Second level –Semester 3  
2020-2021**

## Course Specification of Biophysics for (2020/2021)

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University: Zagazig

Faculty: Pharmacy

### A- Course specifications:

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

Major or Minor element of programs: Major

Department offering the program: -----

Department offering the course: Biochemistry, Faculty of Pharmacy

Academic year Level: level 2 / Semester 3

Date of specification approval:

### B- Basic information:

Title: Biophysics

Code: MD 303

Credit hours:

- Lectures: 1 hr/week
- Practical: 1 hrs/week
- Tutorials: ---
- Total: 2 hrs/week

### C- Professional information:

#### 1-Overall Aims of the Course:

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

Explain biological phenomena using the principles and techniques of physics and modify these techniques to help diagnosis and treat various disorders

## 2- Key elements of biophysics

<b>DOMAIN 1- FUNDAMENTAL KNOWLEDGE</b>	
<b>1-1- COMPETENCY:</b> Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.	
1.C1.1.	Explain the principles of biophysics
1.C1.2	Outline the structure of cell membrane and mechanisms of transport across the cell membrane.
1.C1.3	Identify mechanisms of signal transduction and mechanism of action of different types of receptors.
1.C1.4	Illustrate the bases of biophysical techniques as ECG , Laser and Radiation and their different applications
1.C1.5	Use the proper abbreviations and symbols related to biophysics
<b>DOMAIN 3: PHARMACEUTICAL CARE</b>	
<b>3-1- COMPETENCY:</b> Apply the principles of body functions to participate in improving health care services using evidence-based data.	
3.C1.1.	Link between membrane defect and related disorders.
3.C1.2	Interpret biophysical measurements including blood pressure ECG
<b>DOMAIN 4: PERSONAL PRACTICE</b>	
<b>4-1- COMPETENCY</b> Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.	
4.C1.1.	Recognise the value and structure of the pharmacy team and of a multiprofessional team

## D- Contents

<b>Week No.</b>	<b>Lecture (1hr/week)</b>	<b>Practical session (1hrs/week)</b>
<b>1</b>	-Structure of the plasma membrane	-Lab safety procedures guidelines
<b>2</b>	-Transport across the plasma membrane 1	-Atomic Physics
<b>3</b>	-Transport across the plasma membrane 2	-Biochemical Bonds
<b>4</b>	-Channels and carriers	-The Plasma membrane
<b>5</b>	-Signal Transduction and receptors	-Transport across the plasma membrane
<b>6</b>	- Self learning activity (diagnostic uses of x-ray)	- <b>Practical exam 1</b>
<b>7</b>	- <b>Periodical exam</b>	Activity( application of radioactive isotopes in medical field presented as report and ppt)
<b>8</b>	-Biophysical basis of ECG and blood pressure measurement(electrochemical gradient and membrane action potential – action potential in the heart)	-Ion channel
<b>9</b>	- action potential in the heart(cont.) (ECG technique and interpretation – blood pressure measurement)	-Receptors
<b>10</b>	-Atom and radiation (the quantum model of the atom – electromagnetic spectrum – radioactive decay – types of radiation)	-Water homeostasis
<b>11</b>	-quantification of radiation (sources of radiation – radiation risks – application of radiology)	-Blood pressure and viscosity
<b>12</b>	Laser technology (laser beam properties and generation)	-Action potential
<b>13</b>	- Laser types , hazards and applications	-Heart electricity and ECG
<b>14</b>	- Revision and open discussion	- <b>Practical exam 2</b>

<b>15</b>	-Final exam	

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

- Interactive lectures
- Practical session
- Research assignment
- Self learning
- Blended learning

- **F- Student Assessment Methods:**

1-Written exams to assess: 1.C1.1, 1.C1.2, 1.C1.3, 1.C1.4, 1.C1.5, 3.C1.2

2- Practical exams to assess: 3.C1.1, 3.C1.2

3- Activities to assess: 4.C1.1

4- Oral exam to assess: : 1.C1.1, 1.C1.2, 1.C1.3, 1.C1.4, 1.C1.5

### **Assessment schedule:**

Assessment (1): Written exam	Week 15
Assessment (2): Practical exams	Week 6,14
Assessment (3): Periodical exam	Week 7
Assessment (4): Oral exam	Week 15
Assessment (5): Activity	Week 6, 7

### **Weighting of Assessment**

Assessment method	Marks	Percentage
Activity	5	5%
Periodical exam	10	10%
Practical exam	25	25%
Written exam	50	50%
Oral exam	10	10 %
<b>TOTAL</b>	<b>100</b>	<b>100%</b>



## **G- Facilities Required for Teaching and Learning:**

- Data show , software , videos and screens.

## **H- List of references:**

### **1- Course Notes**

- Student book of Biophysics part1 approved by biochemistry department 2020-2021
- Student book of Biophysics part2 approved by biochemistry department 2020-2021
- Practical note of Biophysics approved by biochemistry department 2020-2021

### **2- Essential books**

- The biophysics of cell membranes-Epand , Richard M, Ruyschaert , Jean Marie (2017)
- Introduction to experimental Biophysics,2<sup>nd</sup>edition-Jayl Nadeau (2018)
- Membrane biophysics : New insights and methods -HongdaWang , Guohuili (2018)

### **3- Recommended books**

- Fundamentals of Biophysics -Andrey B. Rubin,Wiley-Scrivener (2014)
- Biophysics and neurophysiology of the six sense – NimaRezaei , AmeneSaghazadeh.(2019)

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- **Course Coordinators:** Ass. Prof. Nahla Younis
  - **Head of Department**
  - **Date:** تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ





Matrix I of Biophysics									
Course Contents		Key elements of biophysics							
		1-1- COMPETENCY					3- 1COMPETENCY		4-1- COMPETENCY
Lectures		1.C1.1	1.C1.2	1.C1.3	1.C1.4	1.C1.5	3.C1.1	3.C1.2	4.C1.1
		1	-Structure of the plasma membrane	X	X			X	
2	-Transport across the plasma membrane 1	X	X			X			
3	-Transport across the plasma membrane 2	X	X			X			
4	Channels and carriers	x	X			X			
5	-Signal Transduction and receptors	X		x		X			
6	-Biophysical basis of ECG and blood pressure measurement (electrochemical gradient and membrane action potential – action potential in the heart)	X			X	X			
7	- Action potential in the heart (cont.) (ECG technique and interpretation – blood pressure measurement)	X			X	X			
8	-Atom and radiation (the quantum model of the atom – electromagnetic spectrum – radioactive decay – types of radiation)	X			X	X			
9	-Quantification of radiation (sources of radiation – radiation risks – application of radiology)	X			X	X			
10	Laser technology (laser beam properties and generation)	X			X	X			
11	- Laser types , hazards and applications	X			X	X			
Practical sessions									
1	-Lab safety procedures guidelines						X		
2	-Atomic Physics						X		

3	-Biochemical Bonds							X		
4	-The Plasma membrane							X		
5	-Transport across the plasma membrane							X		
6	-Ion channel							X		
7	--Receptors								X	
8	-Water homeostasis								X	
9	-Blood pressure and viscosity								X	
10	-Action potential								X	
11	- Self learning activity (diagnostic uses of x-ray)									X
12	Heart electricity and ECG								x	X
13	Activity( application of radioactive isotopes in medical field presented as report and ppt)									X



## Matrix II of Biophysics

National Academic Reference Standards NARS		Program key elements	Course key elements	Course contents	Sources	Teaching and learning methods			Weighting of assessment			
						lecture	practical session	self learning	written exam	practical exam	oral exam	Midterm exam
<b>1.1.1</b>	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.1	1.C1.1 1.C1.2 1.C1.3 1.C1.4	-Structure of the plasma membrane -Transport across the plasma membrane 1 -Transport across the plasma membrane 2 Channels and carriers -Signal Transduction and receptors -Biophysical basis of ECG and blood pressure measurement (electrochemical gradient and membrane action potential – action potential in the heart)	Student book Essential books Recommended books	<b>X</b>			<b>X</b>		<b>X</b>	<b>X</b>
<b>1.1.2</b>	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8	1.C1.5	- Action potential in the heart (cont.) (ECG technique and interpretation – blood pressure measurement) -Atom and radiation (the quantum model of the atom – electromagnetic spectrum – radioactive decay –	Student book Essential books Recommended books	<b>X</b>			<b>X</b>		<b>X</b>	

				types of radiation) -Quantification of radiation (sources of radiation – radiation risks – application of radiology) Laser technology (laser beam properties and generation) - Laser types , hazards and applications								
<b>3.1.</b> <b>3</b>	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.1	<b>3.C1.1</b> <b>3.C1.2</b>	-Atomic Physics -Biochemical Bonds -The Plasma membrane -Transport across the plasma membrane -Ion channel --Receptors -Water homeostasis -Blood pressure and viscosity -Action potential - Self learning activity (diagnostic uses of x-ray) Heart electricity and ECG Activity( application of radioactive isotopes in medical field presented as report and ppt)	Student book Essential books Recommended books Practical note		<b>X</b>			<b>X</b>		
<b>4.1.1</b>	Demonstrate responsibility for team performance and peer evaluation of other team	4.C1.1	4.C1.1	- Self learning activity (diagnostic uses of x-ray) Activity( application of radioactive isotopes in medical	internet		<b>X</b>					



	members, and express time management skills..			field presented as report and ppt)								
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**Course Coordinator:** Ass. Prof. Nahla Younis

**Date:** تم مناقشة و إعتقاد توصيف المقرر من مجلس القسم بتاريخ:





**COURSE  
SPECIFICATIONS**

**Physiology and  
Pathophysiology**

**Second level –Semester 3  
2020-2021**

## Course specification of Physiology & Pathophysiology

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University: Zagazig

Faculty: Pharmacy

### A- Course specifications:

Program (s) on which the course is given: bachelor of Pharmacy (Clinical Pharmacy pharm D)

Major or Minor element of programs: Major

Department offering the program: -----

Department offering the course: Pharmacology and toxicology Department

Academic year Level: Second level/third semester

Date of specification approval: July 2020

### B- Basic information:

Title: Physiology & Pathophysiology

Code: MD 304

Credit Hours: 3

Lectures: 2hrs/week

Practical: 1hrs/week

Tutorials: ---

Total: 3 hrs/week

### C- Professional information:

#### 1-Overall aim of the course

On completion of the course, the student will be able to explain the basic principles of physiology of major organ systems and the pathophysiology of common diseases.

## 2- Key elements of Physiology & Pathophysiology

<b>DOMAIN 1- FUNDAMENTAL KNOWLEDGE</b>	
<b>1-1- COMPETENCY</b> Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.	
<b>1.C1.1</b>	Outline the basic physiology of major organ systems.
<b>1.C1.2</b>	Illustrate the pathophysiology of common diseases.
<b>1.C1.3</b>	Outline drug classes for the treatment of certain diseases
<b>DOMAIN 3: PHARMACEUTICAL CARE</b>	
<b>3-1- COMPETENCY</b> Apply the principles of body functions to participate in improving health care services using evidence-based data.	
<b>3.C1.1</b>	Handle data effectively to recognize physiology/pathophysiology of organ systems
<b>3.C1.2</b>	Assess health profiles of patient cases
<b>3.C1.3</b>	Suggest suitable drug classes for the treatment of certain diseases
<b>3.C1.4</b>	Integrate information from different sources to solve clinical cases.

## D- Contents:

<b>Week No.</b>	<b>Lecture contents (2 hrs/week)</b>	<b>Practical session (1hr/week)</b>
<b>1</b>	Cell physiology Neuromuscular and synaptic transmission	Lab safety rules
<b>2</b>	PNS Physiology Nervous system physiology	Basic principles of case studies
<b>3</b>	Central nervous system physiology	Pathophysiology of Psychosis Pathophysiology of Parkinsonism
<b>4</b>	Central nervous system physiology	Pathophysiology of Alzheimer disease Pathophysiology of Epilepsy
<b>5</b>	Endocrine physiology	Pathophysiology of Diabetes , other hormonal disorders
<b>6</b>	Renal physiology	Pathophysiology of renal failure
<b>7</b>	Midterm exam	
<b>8</b>	Respiratory physiology	Pathophysiology of Asthma Pathophysiology of Cough
<b>9</b>	GIT physiology	Pathophysiology of Hepatitis, Ulcer, Diarrhea, Constipation
<b>10</b>	Cardiovascular system physiology	Pathophysiology of Hypertension
<b>11</b>	Cardiovascular system physiology	Pathophysiology of Heart failure Pathophysiology of Angina
<b>12</b>	The lymphatic system and immunity	Pathophysiology of Inflammation
<b>13</b>	The lymphatic system and immunity	Pathophysiology Infectious disease
<b>14</b>	Revision and open discussion	<b>Practical exam</b>
<b>15</b>	Final written exam	

## E- Teaching and Learning Methods:

- Lectures
- Practical sessions
- Think/pair/share
- Case study

- Blended learning

## **F- Student Assessment methods:**

- 1- Written exams to assess: 1.C1.1, 1.C1.2, 1.C1.3
- 2- Case study to assess : 3.C1.1, 3.C1.2, 3.C1.3, 3.C1.4
- 3- Practical exams to assess: 3.C1.1, 3.C1.2, 3.C1.3, 3.C1.4
- 4- Oral exam to assess: 1.C1.1, 1.C1.2, 1.C1.3

## **Assessment schedule**

<b>Assessment (1):</b> Midterm exam	Week 7
<b>Assessment (2):</b> Activity (case studies in team work)	Week 9,10
<b>Assessment (3):</b> Practical exam	Week 14
<b>Assessment (4):</b> Final written exam	Week 15
<b>Assessment (5):</b> Oral exams	Week 15

## **Weighting of Assessment**

<b>Assessment method</b>	<b>Marks</b>	<b>Percentage</b>
<b>Midterm exam</b>	10	10%
<b>Activity</b> (case studies in team work)	5	5%
<b>Practical practice &amp; exam</b>	25	25%
<b>Final written exam</b>	50	50%
<b>Oral exam</b>	10	10%
<b>TOTAL</b>	100	100%

## **G- Facilities required for teaching and learning:**

Black ( white ) boards, data show, air conditioned classroom

## **H- List of References:**

**1- Course Notes:** Student book approved by Toxicology and Pharmacology department (2020)

- Practical notes approved by Toxicology and Pharmacology department (2020)

## **2- Essential Books:**

i- Essentials of Pathophysiology: Concepts of Altered Health States, 4<sup>th</sup> ed., CM Porth, (2015), Wolters Kluwer, Philadelphia, USA.

## **3- Recommended Books:**

i- Essentials of anatomy and physiology, 5th ed., VC Scanlo and T Sanders (2007), F. A. Davis Company, Philadelphia, UAS..

## **4- Periodicals and websites:**

i- Advanced Physiology and Pathophysiology: Essentials for Clinical Practice

<https://www.springerpub.com/advanced-physiology-and-pathophysiology-9780826177070.html>

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**Course Coordinator: Assist. Prof. Dr. Waleed Barakat**

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

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







## Matrix I of Physiology & Pathophysiology

Course Contents		Key elements of Physiology & Pathophysiology course								
		1-1- COMPETENCY			3-1- COMPETENCY					
Lectures		1.C1.1	1.C1.2	1.C1.3	3.C1.1	3.C1.2	3.C1.3	3.C1.4		
1	Cell physiology Neuromuscular and synaptic transmission	X	X	X						
2	PNS Physiology Nervous system physiology	X	X	X						
3	Central nervous system physiology	X	X	X						
4	Central nervous system physiology	X	X	X						
5	Endocrine physiology	X	X	X						
6	Renal physiology	X	X	X						
7	Respiratory physiology	X	X	x						
8	GIT physiology	X	X	X						
9	Cardiovascular system physiology	X	X	X						
10	Cardiovascular system physiology	X	X	X						
11	The lymphatic system and immunity	X	X	X						
12	The lymphatic system and immunity	X	X	X						
13	Revision and open discussion	X	X	x						
<b>Practical session</b>										
1	Lab safety rules				X	X	X	X		
2	Basic principles of case studies				X	X	X	X		
3	Pathophysiology of Psychosis Pathophysiology of Parkinsonism				X	X	X	X		
4	Pathophysiology of Alzheimer disease Pathophysiology of Epilepsy				x	X	X	X		
5	Pathophysiology of Diabetes , other hormonal				X	x	x	X		

	disorders									
6	Pathophysiology of renal failure				X	X	X	x		
7	Pathophysiology of Asthma Pathophysiology of Cough				X	X	X	X		
8	Pathophysiology of Hepatitis, Ulcer, Diarrhea, Constipation				X	X	X	X		
9	Pathophysiology of Hypertension				X	X	X	X		
10	Pathophysiology of Heart failure Pathophysiology of Angina				X	X	X	X		
11	Pathophysiology of Inflammation				X	X	X	X		
12	Pathophysiology Infectious disease				x	x	x	X		

## Matrix II of Physiology & Pathophysiology course

National Academic Reference Standards NARS		Program key elements	Course key elements	Course contents	Sources	Teaching and learning methods			Weighting of assessment			
						lecture	practical session	case study/ think-pair-share	written exam	practical exam	oral exam	Midterm exam
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.3	1.C1.1 1.C1.2 1.C1.3	Cell physiology Neuromuscular and synaptic transmission PNS Physiology Nervous system physiology Central nervous system physiology Central nervous system physiology Endocrine physiology Renal physiology Respiratory physiology GIT physiology Cardiovascular system physiology	Student book Essential books	x			x		x	x
				Cardiovascular system physiology Cardiovascular system physiology The lymphatic system and immunity The lymphatic system and immunity	Student book Essential books	x			x		x	x
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8										

3.1.1	Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.	3.C1.1	3.C1.1 3.C1.2 3.C1.3 3.C1.4	Lab safety rules Basic principles of case studies Pathophysiology of Psychosis Pathophysiology of Parkinsonism Pathophysiology of Alzheimer disease Pathophysiology of Epilepsy Pathophysiology of Diabetes , other hormonal disorders Pathophysiology of renal failure Pathophysiology of Asthma Pathophysiology of Cough Pathophysiology of Hepatitis, Ulcer, Diarrhea, Constipation Pathophysiology of Hypertension Pathophysiology of Heart failure Pathophysiology of Angina Pathophysiology of Inflammation Pathophysiology Infectious disease	Practical notes		x			x		
				Practical notes		x			x			

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**Course Coordinator: Assist. Prof. Dr. Waleed Barakat**

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

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









**COURSE  
SPECIFICATIONS**

**General Microbiology  
and Immunology**

**Second level –Semester 3  
2020-2021**

## Course specification of General Microbiology and Immunology

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University: Zagazig

Faculty: Pharmacy

### A- Course specifications:

Program (s) on which the course is given: Bachelor of Pharmacy (clinical pharmacy Pharm D)

Major or Minor element of programs: major

Department offering the program: -----

Department offering the course: Microbiology and Immunology

Academic year Level: Second Level/Semester3

Date of specification approval: September 2020

### B- Basic information:

Title: General Microbiology and Immunology Code: PM 301

Credit Hours: 3 hrs

Lectures: 2 hrs/week

Practical: 1 hrs/week

Tutorials: ---

Total hours: 3 hrs/week

### C- Professional information:

#### 1-Overall aim of the course

On completion of the course, the student will have good knowledge about, microorganisms, their morphology, diversity, cell structure and function, cultural characteristics, growth, metabolism, role of microorganisms in infectious diseases and microbial pathogenesis. It also clarifies different mechanisms of transport across bacterial cell membrane, metabolic pathways and physiology of bacteria. The course also covers the principles of genetic characters including DNA and RNA structures, replication, different forms of mutation and mutagenic agents. It also explores the basic concepts microbial growth, cultivation and reproduction. Moreover it introduces the modern concepts of medical immunology, with an emphasis on Host parasite relationship, Non-specific and specific immunity,

Mechanism of protective immunity. Molecular and cellular immunology, including antigen and antibody structure, function and reaction between them, effector mechanisms, complement, and cell mediated immunity. Active and passive immunization. Hypersensitivity and in vitro antigen antibody reactions, Immuno-deficiency disorders, Autoimmunity and auto-immune disease, organ transplantation.

## 2- 2- Key elements of General Microbiology and Immunology

<b>DOMAIN 1- FUNDAMENTAL KNOWLEDGE</b>	
<b>1-1- COMPETENCY</b> Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.	
1.C1.1	Illustrate different types of microorganisms and their way of life. Perform microscopical examinations, biochemical tests and serological reactions for identification of microorganisms
1.C1.2	Define the basic microbial growth conditions and metabolism. Monitor the microbial growth and growth conditions on different types of common culture media.
1.C1.3	Use the proper terms of microbiology and immunology.
1.C1.4	Illustrate the principles of immunology including natural and acquired immunity and antigen–antibody reactions. Identify the functions of immune system in health state and during disease state
1.C1.5	Outline the basis of bacterial genetics
<b>DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE</b>	
<b>2-3- COMPETENCY</b> Handle and dispose biologicals and synthetic/natural pharmaceutical materials /products effectively and safely with respect to relevant laws and legislations.	
2.C3.1	Handle basic laboratory equipments, chemicals and biohazards effectively and safely.
2.C3.2	Apply GLP guidelines in safe handling of biohazards
<b>DOMAIN 3: PHARMACEUTICAL CARE</b>	
<b>3-1- COMPETENCY</b> Apply the principles of body functions to participate in improving health care services using evidence-based data.	
3.C1.1	Analyze and interpret experimental results of serological reactions
3.C1.2	Analyze and interpret experimental results for differentiation between different microorganisms
<b>DOMAIN 4: PERSONAL PRACTICE</b>	
4-1- COMPETENCY	

Express leadership, time management, critical thinking, problem solving, independent and team working, creativity and entrepreneurial skills.	
4.C1.1	Work effectively as a member of a team
4.C1.2	Develop internet search and computer skills

## D- Contents:

Week	Lecture contents (2 hrs/week)	Practical session (1hrs/week)
1	<ul style="list-style-type: none"> <li>General introduction to microbiology and historical review</li> <li>Introduction to immunology</li> </ul>	<ul style="list-style-type: none"> <li>Laboratory safety measures</li> <li>Microscopy and general terms of microbiology</li> </ul>
2	<ul style="list-style-type: none"> <li>Description of microorganisms Classification and types of Microorganisms</li> <li>Introduction to immunology</li> </ul>	<ul style="list-style-type: none"> <li>Microscopical examination of Bacteria: preparation and staining of smear, simple stain and negative stain</li> </ul>
3	<ul style="list-style-type: none"> <li>Brief description of viruses, fungi and protozoa</li> <li>Immunity – innate immunity Immune system</li> </ul>	<ul style="list-style-type: none"> <li>Differential stains: Gram-stain</li> </ul>
4	<ul style="list-style-type: none"> <li>Bacteria: description and classification</li> <li>Cells of immune response Immunogens or antigens</li> </ul>	<ul style="list-style-type: none"> <li>Differential stains: Gram-stain of mixtures of microorganisms</li> <li><b>Activity</b></li> </ul>
5	<ul style="list-style-type: none"> <li>Anatomy and structure of bacterial cells</li> <li>Acquired immune response 1. Cell mediated immunity</li> </ul>	<ul style="list-style-type: none"> <li>Differential stain: Acid-fast stain (Ziehl Neelsen stain)</li> <li>Examination of living bacteria: hanging drop technique</li> </ul>
6	<ul style="list-style-type: none"> <li>Growth and cultivation of bacteria, bacterial growth curve</li> <li>Humoral immune response And Cytokines</li> </ul>	<ul style="list-style-type: none"> <li>Spore stain</li> <li>Microscopic examination of fungi: lactophenol mount</li> </ul>
7	<b>Mid-term exam</b>	
8	<ul style="list-style-type: none"> <li>Microbial metabolism</li> <li>Agglutination and complement fixation reactions</li> </ul>	<ul style="list-style-type: none"> <li>Cultivation of bacteria: types of common culture media and growth conditions</li> </ul>
9	<ul style="list-style-type: none"> <li>Microbial metabolism</li> <li>Immunologic mechanisms of tissue damage</li> </ul>	<ul style="list-style-type: none"> <li>Biochemical activities of and identification of bacteria</li> </ul>
10	<ul style="list-style-type: none"> <li>Microbial metabolism</li> <li>Hypersensitivity reactions</li> </ul>	<ul style="list-style-type: none"> <li>Serological reactions (Precipitation reactions)</li> <li><b>Activity</b></li> </ul>
11	<ul style="list-style-type: none"> <li>Microbial genetics</li> <li>Transplantation immunology</li> </ul>	<ul style="list-style-type: none"> <li>Serological reactions (Agglutination reactions)</li> </ul>
12	<ul style="list-style-type: none"> <li>Transcription and Protein synthesis</li> </ul>	<ul style="list-style-type: none"> <li>Serological reactions</li> </ul>

	<ul style="list-style-type: none"> <li>• Autoimmune diseases</li> </ul>	(Complement fixation reaction
<b>13</b>	<ul style="list-style-type: none"> <li>• Genetic variation</li> <li>• Tumour immunology</li> </ul>	<b>Final practical exam</b>
<b>14</b>	<ul style="list-style-type: none"> <li>• Genetic Transfer among bacteria</li> <li>• Immunoprophylaxis</li> </ul>	
<b>15</b>	<ul style="list-style-type: none"> <li>• Written exam</li> </ul>	

### E- Teaching and Learning Methods:

- Lectures
- Practical sessions
- Internet search and poster preparation
- Blended learning
- Others : videos

### F- Student Assessment methods:

- 1- Written exams to assess: 1.C1.1, 1.C1.2, 1.C1.3, 1.C1.4, 1.C1.5, 3.C1.1, 3.C1.2
- 2- Activity to assess: 4.C1.1, 4.C1.2
- 3- Practical exams to assess: 2.C3.1, 2.C3.2, 3.C1.1, 3.C1.2
- 4- Oral exam to assess 1.C1.1, 1.C1.2, 1.C1.3, 1.C1.4, 1.C1.5, 3.C1.1, 3.C1.2, 4.C1.1, 4.C1.2

### Assessment schedule

<b>Assesment (1):</b> Midterm exam	Week 7
<b>Assessment (2):</b> Activity (Poster)	Week 4, 10
<b>Assessment (3):</b> Practical exams	Week 13
<b>Assessment (4):</b> Final written exam	Week 15
<b>Assessment (5):</b> Oral exams	Week 15

### Weighting of Assessment

Assessment method	Marks	Percentage
Activity & Periodical exam	15	15%
Practical exam	25	25%

<b>Final written exam</b>	50	50%
<b>Oral exam</b>	10	10%
<b>TOTAL</b>	100	100%

## **G- Facilities required for teaching and learning:**

- 1. For lectures:** Black (white) boards, and data show.
- 2. For Labs.:** Chemicals, Autoclaves, Incubators, Ovens, Water bathes, staining dyes, microscopes, refrigerators and microbiological culture media

## **H- List of References:**

**1- Course Notes:** Student book of **General Microbiology and Immunology**  
Approved by **Microbiology and Immunology** department

### **2- Essential Books:**

- Jackson M, Lowey A. Handbook of extemporaneous preparation. A guide to pharmaceutical compounding. Published by Pharmaceutical Press, 2018.

### **3- Recommended Books**

- Martindale, "The extra pharmacopeia". 38st edn, by James, E.F Reynolds. And Kathleen Parfitt, Royal Pharmaceutical Society, London (2014).

### **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/ Nehal Elsayed**

**Head of Department: Prof / Nehal Elsayed Yousef**

**Date تم مناقشة و اعتماد توصيف المقرر من مجلس القسم بتاريخ**





# Matrix1 of General Microbiology and Immunology

Course content		Key elements of principles of General Microbiology and Immunology										
		DOMAIN 1- FUNDAMENTAL KNOWLEDGE					DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE		DOMAIN 3: PHARMACEUTICAL CARE		DOMAIN 4: PERSONAL PRACTICE	
		1.C1.1	1.C1.2	1.C1.3	1.C1.4	1.C1.5	2.C3.1	2.C3.2	3.C1.1	3.C1.2	4.C2.1	4.C2.2
1	<ul style="list-style-type: none"> <li>• General introduction to microbiology and historical review</li> <li>• Introduction to immunology</li> <li>• <b>Practical</b></li> <li>• Microscopy &amp; general terms of microbiology</li> </ul>	x		x	x			x				
2	<ul style="list-style-type: none"> <li>• Description of microorganisms and types of Microorganisms</li> <li>• Introduction to immunology</li> <li>• <b>Practical</b></li> <li>• Microscopical examination of Bacteria by simple and negative stain</li> </ul>	x			x			x	x			
3	<ul style="list-style-type: none"> <li>• Brief description of viruses, fungi and protozoa</li> <li>• Immunity – innate immunity</li> <li>• Immune system</li> <li>• <b>Practical</b></li> <li>• Differential stains: Gram-stain</li> </ul>	x			x			x	x			

4	<ul style="list-style-type: none"> <li>• Bacteria: description and classification</li> <li>• Cells of immune response</li> <li>Immunogens or antigens</li> <li><b><u>Practical</u></b></li> <li>• : Gram-stain: mixture</li> <li>• <b>Activity</b></li> </ul>		x		x					x		x		x		x
5	<ul style="list-style-type: none"> <li>• Anatomy &amp; structure of bacterial cells</li> <li>• Acquired immune response: Cell mediated immunity</li> <li><b><u>Practical</u></b></li> <li>• Differential stain: (Acid-fast stain)</li> <li>• Examination of living bacteria:</li> </ul>	x			x											
6	<ul style="list-style-type: none"> <li>• Growth and cultivation of bacteria, bacterial growth curve</li> <li>• Humoral immune response and Cytokines</li> <li><b><u>Practical</u></b></li> <li>• Spore stain</li> <li>• Microscopic examination of</li> </ul>		x				x		x		x					

	fungi										
7	• <b>Midterm exam</b>						X	X			
8	Microbial metabolism Agglutination and CFT <b>Practical</b> Cultivation of bacteria: types of common culture media and growth conditions		X						X		
9	Microbial metabolism Immunologic mechanisms of tissue damage <b>Practical</b> Biochemical activities of and identification of bacteria		X		X						
10	Microbial metabolism • Hypersensitivity reactions <b>Practical</b> • serological reactions <b>Activity</b>		X		X		X			X	X
11	• Microbial genetics • Transplantation immunology <b>Practical</b> • serological reactions		X		X		X		X		
12	• Transcription and Protein synthesis Autoimmune diseases <b>Practical</b> • serological reactions				X	X	X		X		
13	• Genetic variation • Tumour immunology				X	X	X		X		
14	• Genetic Transfer				X	X	X		X		





## Matrix2 of General Microbiology and Immunology

National Academic Reference Standards (NARS)		Program key elements	Course key elements	Course contents	Sources	Teaching and learning methods			Method of assessment			
						lecture	practical session	Activity	written exam	practical exam	oral exam	Midterm exam
1-1-1	Principles of basic, pharmaceutical, medical, social, behavioral, management, health and environmental sciences as well as pharmacy practice	1.C1.2	1.C1.2	•Growth and cultivation of bacteria, bacterial growth curve	Student book Essential books	x			x		x	x
			1.C1.5	•Microbial genetics •Genetic variation •Genetic Transfer among bacteria	Student book Essential books	x			x		x	x
		1.C1.3	1.C1.3	•Introduction to immunology •Acquired immune response 1.Cell mediated immunity •Humoral immune response And Cytokines	Student book Essential books	x			x		x	x
			1.C1.4	Cells of immune response Immunogens or antigens •Agglutination and complement fixation reactions •Hypersensitivity reactions	Student book Essential books	x			x		x	x

1.1.2	Use the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	1.C1.8	1.C1.3	<ul style="list-style-type: none"> <li>•General introduction to microbiology and historical review</li> <li>•Introduction to immunology</li> </ul>	Student book Essential books	x			x	x	x	x
2.3.1	Handle and dispose chemicals and pharmaceutical preparations safely.	2.C3.1.	2.C3.1	<ul style="list-style-type: none"> <li>•General introduction to microbiology and historical review</li> <li>•Introduction to immunology</li> </ul>	Practical notes	x	x		x			
2.3.2	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.	2.C3.2	2.C3.2	<ul style="list-style-type: none"> <li>•Agglutination and complement fixation reactions</li> <li>•Growth and cultivation of bacteria, bacterial growth curve</li> </ul>	practical notes	x	x		x			
3-1-3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.4	3.C1.1 3.C1.2		practical notes							



4-1-1	Manage time as evidenced by the ability to plan and implement efficient mode of working.	4.C1.3	4.C1.1		Student book practical notes			x			x	x
4.1.2	Retrieve and evaluate information from different sources to improve Professional competencies.	4.C1.4	4.C1.2		Practical notes Recommended books Internet			x				x





**COURSE  
SPECIFICATIONS**

**Pharmaceutics I**

**Second level –Semester 3  
2020-2021**

## Course specification of Pharmaceutics I

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University: Zagazig

Faculty: Pharmacy

### A- Course specifications:

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

Major or Minor element of programs: Major

Department offering the program: -----

Department offering the course: Pharmaceutics Department

Academic year Level: Second year/ semester3

Date of specification approval: September 2020

### B- Basic information:

Title: Pharmaceutics I

Code: **PT 303**

Credit Hours: ---

Lectures: 2hr/week

Practical: 1hr/week

Tutorials: ---

Total: 3 hrs/week

### C- Professional information:

#### 1-Overall aim of the course

This course provides students with knowledge of the system of weights, measures, mathematical expertise and pharmaceutical calculations requisite to the compounding, dispensing, and utilization of drugs in pharmacy practice. Liquid dosage forms (solution, suspensions, emulsions and colloids)

## 2- Key elements of Pharmaceutics I

<b>DOMAIN 1- FUNDAMENTAL KNOWLEDGE</b>	
<b>1-1- COMPETENCY:</b> Integrate knowledge from basic and applied pharmaceutical and clinical sciences to standardize materials, formulate and manufacture products, and deliver population and patient-centered care.	
<b>1.C1.1.</b>	Define different liquid dosage forms, different measuring systems and different types of incompatibility.
<b>1.C1.2.</b>	Enumerate the ideal characters of different liquid pharmaceutical dosage forms; solutions, emulsions, suspensions, colloids.
<b>1.C1.3.</b>	Describe the different methods for preparation of solutions, emulsions, suspensions and colloids.
<b>1.C1.4.</b>	Illustrate the ideal characters for packaging, labeling, storing and distribution process in industry
<b>1.C1.5</b>	Select the appropriate ingredients used in formulation of different liquid dosage forms
<b>DOMAIN 2: PROFESSIONAL AND ETHICAL PRACTICE</b>	
<b>2-2- COMPETENCY:</b> Standardize pharmaceutical materials, formulate and manufacture pharmaceutical products, and participate in systems for dispensing, storage, and distribution of medicines.	
<b>2.C2.1</b>	Apply good handling and disposal skills of different chemicals and pharmaceutical preparations.
<b>2.C2.2.</b>	Perform different pharmaceutical calculations
<b>2.C2 3.</b>	Compound, dispense and label different pharmaceutical dosage forms safely and effectively
<b>2.C2.4</b>	Identify incompatibility problems with proper overcoming strategies
<b>2-3- COMPETENCYL:</b> Handle and dispose biologicals and synthetic/natural pharmaceutical materials /products effectively and safely with respect to relevant laws and legislations.	
<b>2.C3.1.</b>	Handle pharmaceutical preparations safely
<b>DOMAIN 4: PERSONAL PRACTICE</b>	
<b>4-1- COMPETENCY</b>	
Express leadership, time management, critical thinking, problem solving,	

independent and team working, creativity and entrepreneurial skills.

4.C1.1. Develop team working skills

## D- Contents:

<b>Week No.</b>	<b>Lecture contents (2 hr/week)</b>	<b>Practical session (1hr/week)</b>
<b>1</b>	<b>Fundamentals of measurements and calculations</b> - Arabic and Roman Numerals <b>Systems of Measurement</b> -The Metric System	<b>Pharmaceutical calculations:</b> Measurement Systems
<b>2</b>	<b>Systems of Measurement (Cont.)</b> - Apothecary and Avoirdupois systems (The Common Systems) - Household system	<b>Pharmaceutical calculations:</b> Dilution and concentration of Solutions
<b>3</b>	- Dilution and concentration of Solutions - Reducing and Enlarging Formulas, percentage and ratio strength problems - Calculation of Doses for Children	<b>Pharmaceutical calculations:</b> Reducing and Enlarging Formulas, percentage and ratio strength problems
<b>4</b>	- Introduction to liquid dosage forms <b>Solutions:</b> Advantages and disadvantages Of Solutions, Aqueous liquid dosage forms pharmaceutical Solutions	-Preparation of aromatic water -Preparation of Simple mixture of liquorice
<b>5</b>	<b>Solutions:</b> Non aqueous liquid dosage forms Sweet and/or viscid liquid dosage forms, Manufacture of solutions	-Preparation Ammonium Chloride Cough Mixture -Preparation of Ear drops
<b>6</b>	<b>Emulsion:</b> General description, Advantages and disadvantages of pharmaceutical emulsions, emulsion instability and theories of emulsification	-Methods of preparation of emulsions a- wet method b- dry method
<b>7</b>	<b>Mid-term exam</b>	
<b>8</b>	<b>Emulsion:</b> Formulation of pharmaceutical emulsions, Excipients used in pharmaceutical emulsions, Manufacture of emulsions	Castor oil emulsion (wet method) Castor oil emulsion (Dry Method)
<b>9</b>	<b>Suspension:</b> Introduction, advantages and disadvantages of Suspension, Reasons for preparing suspension, Characters of ideal suspension	Mineral oil emulsion (wet method) Mineral oil emulsion (Dry Method)
<b>10</b>	<b>Suspension:</b> Formulation and	preparation of Suspension

	evaluation of suspensions, Stability of suspensions	
<b>11</b>	<b>Colloids:</b> introduction, Pharmaceutical application of colloids, Types of colloidal systems	determination of sedimentation rate
<b>12</b>	<b>Colloids:</b> Preparation of colloids, purification, Properties of colloids (kinetic, optical, electrical)	Incompatibility
<b>13</b>	<b>-Stability of colloids</b> - Electrical Double Layer, Nernst And Zeta Potentials, Importance Of Zeta Potential	<b>Practical exam</b>
<b>14</b>	- <b>Incompatibility:</b> definition, types, examples, importance, intentional incompatibilities.	
<b>15</b>	<b>Final written exam</b>	

### E- Teaching and Learning Methods:

- Lectures
- Practical sessions
- Think/pair/share
- Blended learning

### F- Student Assessment methods:

- 1- Written exams to assess: 1.C1.1, 1.C1.2, 1.C1.3, 1.C1.4, 1.C1.5
- 2- Practical exams to assess: 2.C2.1, 2.C2.2, 2.C2.3, 2.C2.4, 2.C3.1
- 3- Activity within labs: 4.C1.1
- 4- Oral exam to assess: 1.C1.1, 1.C1.2, 1.C1.3, 1.C1.4, 1.C1.5

### Assessment schedule

<b>Assessment (1):</b> Periodical exams	Week 7
<b>Assessment (2):</b> Final written exams	Week 15
<b>Assessment (3):</b> Practical exams & practical work	Weekly
<b>Assessment (4):</b> Oral exams	Week 15

### Weighting of Assessment

Assessment method	Marks	Percentage
Periodical exam	10	10%



<b>Final Written exam</b>	50	50%
<b>Activities</b>	5	5%
<b>Practical exams</b>	25	25%
<b>Oral exam</b>	10	10%
<b>TOTAL</b>	100	100%

## **G- Facilities required for teaching and learning:**

For lectures: Black (white) boards, data show

For labs: Chemicals, glass ware, digital balance, water bathes

## **H- List of References:**

**1- Course Notes:** Student book of physical pharmacy approved by pharmaceuticals department 2020-2021

### **2- Essential Books:**

- The science of dosage form design, Aulton, M. E., 2nd edition, Churchill Livingstone, London. (2002).
- Pharmaceutical Dosage Forms: Rational design and formulation with excipients, Larry L. Augsburger, Stephen W. Hoag, Informa Healthcare USA, (2008)
- Pharmaceutical Calculations, 12<sup>th</sup> edition, Howard C. Ansel and Mitchell J. Stoklosa.(2005)
- Aulton, Michael E. Pharmaceuticals: The Science of Dosage Form Design. 2<sup>nd</sup> ed. Churchill, 2002

### **3- Recommended Books:**

- Remington's Pharmaceutical Science. Alfonso, Gennaro, R., 17<sup>th</sup> edn, Mack Publishing Company, USA. (1985).
- Handbook of Pharmaceutical Manufacturing Formulations: Liquid products, [Sarfraz Niazi](#), Sarfaraz K. Niazi, CRC Press, (2004).
- Pharmacy Calculations for Technicians, 3<sup>rd</sup> edition, EMCParadigm publishing. Don A. Ballington and Tova Wiegand Green. (2007)

### **4- Periodicals and websites:**

[www.emedicine.com](http://www.emedicine.com)

[www.sciencedirect.com](http://www.sciencedirect.com)

[www.pubmed.com](http://www.pubmed.com)

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**Course Coordinator: Dr. Azza Ali Hasan Soliman**

**Head of Department: Dr. Nagia Ahmed El-megrab**

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## Matrix I of Pharmaceutics I course

### Key elements of Pharmaceutics I course

<b>Course Contents</b>		<b>1-1- COMPETENCY</b>					<b>2-2- COMPETENCY</b>					<b>2-3- COMPETENCY</b>	<b>4-1- COMPE TENCY</b>
												<b>2.C3.1</b>	<b>4.C1.1</b>
<b>Lectures</b>		<b>1.C1 .1</b>	<b>1.C1 .2</b>	<b>1.C1 .3</b>	<b>1.C1 .4</b>	<b>1.C1 .5</b>	<b>2.C2 .1</b>	<b>2.C2 .2</b>	<b>2.C2 .3</b>	<b>2.C2. 4</b>	<b>2.C2. 5</b>		
<b>1</b>	Systems of Measurement	x											
<b>2</b>	Systems of Measurement (Cont.)	X											
<b>3</b>	Different Calculations problems	X						x					
<b>4</b>	Liquid dosage forms Solutions	X	x	x	x	x							
<b>5</b>	Solutions (Cont.)	X			x	x					x		
<b>6</b>	Emulsion	X	x	x	x	x							
<b>7</b>	Emulsion (Cont.)	X	x	x	x	X					x		
<b>8</b>	Suspension	X	x	x	X	X							
<b>9</b>	Suspension (Cont.)	X	X		X	X					x		
<b>10</b>	Colloids	x	x	x	x	X							
<b>11</b>	Colloids (Cont.)	x	X	x	x	x					x		
<b>12</b>	Electrical Double Layer, Nernst And Zeta Potentials, Importance Of Zeta Potential		x										
<b>13</b>	Incompatibility	x								x			
<b>Practical session</b>													
<b>1</b>	Measurement Systems						x	X	x				

2	Dilution and concentration of Solutions						x	x	X			
3	Reducing and Enlarging Formulas, percentage and ratio strength problems						x	x	x			
4	-Preparation of aromatic water -Preparation of Simple mixture of liquorice						x	x	x			x
5	-Preparation Ammonium Chloride Cough Mixture -Preparation of Ear drops						X	x	x			x
6	-Methods of preparation of emulsions						x	X	x			x
7	Castor oil emulsion (wet method) Castor oil emulsion (Dry Method)						x	X	x			x
8	Mineral oil emulsion (wet method) Mineral oil emulsion (Dry Method)						x	X	x			x
9	preparation of Suspension						x	x	x			x
10	determination of sedimentation rate						x	x	x			x
11	Incompatibility										x	x

## Matrix II of Pharmaceutics I course

National Academic Reference  Standards NARS		Program key elements	Course key elements	Course contents	Sources	Teaching and learning methods			Weighting of assessment			
						lecture	practical session	case study/ think-pair-share self learning	written exam	practical exam& activity	oral exam	Midterm exam
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.2	1.C1.1	Systems of Measurement Systems of Measurement (Cont.) Different Calculations problems Liquid dosage forms Solutions Solutions (Cont.) Emulsion Emulsion (Cont.) Suspension Suspension (Cont.) Colloids Colloids (Cont.)	Student book Essential books	x			x		x	x

			1.C1.2	Liquid dosage forms	Student book Essential books	x			x		x	x
			1.C1.3	Solutions Solutions (Cont.) Emulsion	Student book Essential books	x			x		x	x
			1.C1.4	Emulsion (Cont.) Suspension Suspension (Cont.)	Student book Essential books	x			x		x	x
			1.C1.5	Colloids Colloids (Cont.)	Student book Essential books	x			x		x	x
2-2-2	Apply the basic requirements of quality management system in developing, manufacturing, analyzing, storing, and distributing pharmaceutical materials/ products considering various incompatibilities.	2.C2.2. 2.C2.3 2.C2.5	2.C2.1 2.C2.2 2.C2.3 2.C2.4	Measurement Systems Dilution and concentration of Solutions Reducing and Enlarging Formulas, percentage and ratio strength problems -Preparation of aromatic water -Preparation of	Practical notes		x			x		

2.3.1	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field.	2.C3.1	2.C3.1 Simple mixture of liquorice -Preparation Ammonium Chloride Cough Mixture -Preparation of Ear drops -Methods of preparation of emulsions Castor oil emulsion (wet method) Castor oil emulsion (Dry Method) Mineral oil emulsion (wet method) Mineral oil emulsion (Dry Method) preparation of Suspension determination of sedimentation rate		x				x		
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				Incompatibility								
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.C1.1	4.C1.1		Practical notes		x				x	

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