



وحدة ضمان الجودة



Courses Specifications Faculty of Pharmacy

Bachelor of pharmacy- Pharm D Program

Second level

2025-2026



وحدة ضمان الجودة



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وحدة ضمان الجودة



Semester 3

**COURSE
SPECIFICATIONS**

**Pharmaceutical
Organic Chemistry III**

**Second Level– Semester 3
2025-2026**

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmaceutical Organic Chemistry III			
Course Code (according to the bylaw)	PR 303			
Department/s participating in delivery of the course	Pharmaceutical Organic Chemistry			
	Theoretical	Practical	Other (specify)	Total
Number of credit hours/points of the course (according to the bylaw)	2 hrs/week	1hrs/week	---	3hrs/week
Course Type	faculty requirement			
Academic level at which the course is taught	level 2- semester 3			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Zakaria Kamel Abdel Samii			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

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

Outline the chemistry of carbohydrates, their identification, and their application in pharmaceutical compounds.

Identify the chemistry of heterocyclic compounds and the principles of spectroscopy

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
Code	Text	Code	Text
1-1-1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences	1.C1.1.1	Outline the chemistry of carbohydrates and their important chemical reactions.
		1.C1.2.1	Illustrate the principles of UV, IR, NMR and Mass spectroscopy.
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	Identify different synthetic pathways for pharmaceutical heterocyclic compounds including commercially available drugs.
2-2-1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/natural pharmaceutical materials.	2.C2.1.1	Synthesis different pharmaceutically active nuclei including pyrazole, benzotriazole, benzothiophene and quinoxalinone
		2.C2.1.2	Perform identification tests for carbohydrates.
		2.C2.1.3	Purify different target compounds using separation techniques.
2-2-3	Recognize the principles of various tools and instruments,	2.C2.4.1	Describe the principles of various instruments and analytical techniques used in spectroscopy, such as UV-Vis, IR,

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
2.3.1	and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals		NMR, and mass spectrometry
		2.C2.5.1	Recognize and select the proper spectroscopic technique for pharmaceutical compounds identification.
		2.C2.5.2	Recognize the appropriate methods of synthesis of different heterocyclic compounds
4.1.2	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/products used in pharmaceutical field.	2.C3.1.1	Handle basic laboratory equipment and chemicals effectively and safely.
4.1.3	Retrieve and critically analyze information, identify and solve problems, and Work autonomously and effectively in a team	4.C1.5.1	Work effectively as a member of a team.
4.1.3	Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.	4.C2.2.1	Demonstrate effective presentation skills

4. Teaching and Learning Methods

- 1- Lectures (data show, board)
2. Practical session
3. Self-learning (Activity)
4. Team-based learning (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/,)	Training (Practical/Clinical/,)	Self-learning (Tasks/Assignment s/ Projects/ ...)	Other (to be determined)
1	- Lecture Spectroscopy -UV and visible spectroscopy	2	2	---	---	---
	Practical session Lab. Safety Applications on UV and visible spectroscopy	2	---	1	---	---
2	- Lecture Infrared spectroscopy -Applications on infrared spectroscopy	2	2	----	----	---
	Practical session Applications on Infrared spectroscopy	2	---	1	----	---
3	- Lecture Mass spectrometry	2	2	----	---	---
	Practical session Applications on Mass spectrometry	2	---	1	----	---
4	Lecture 1H-NMR spectroscopy Formative assessment (quiz1)	2	2	---	----	---
	Practical session Applications on 1H-NMR	2	---	1	----	---
5	Lecture 13C-NMR spectroscopy Applications on spectroscopy	2	2	---	----	---
	Practical session Applications on spectroscopy and 13C NMR	2	---	1	----	---
6	- Lecture Heterocyclic chemistry -Nomenclature of heterocyclic compounds	2	2	1	---	---
	Practical session Synthesis of 3,5-dimethyl pyrazole	2	----	1	---	---

7	Midterm Exam					
8	- Lecture Five-membered heterocyclic with one heteroatom, synthesis and reactions	2	2	---	---	---
	Practical session Synthesis of 3-methyl-1H-quinoxalin-2-one	2	---	1	---	---
9	- Lecture Indole (benzo[b]pyrrole) - Five-membered rings containing two heteroatoms. synthesis and reactions	2	2	---	---	---
	Practical session Applications on nomenclature of 6-membered heterocyclic compounds	2	---	1	---	---
10	- Lecture Six-membered heterocyclic with one heteroatom: synthesis, reactions and applications. Formative assessment (quiz2)	2	2	---	---	---
	Practical session Applications on nomenclature of fused 6-membered heterocyclic compounds+Activity	2	---	1	---	---
11	Lecture Six-membered rings containing two heteroatoms + purine nucleus and application.	2	2	--	---	---
	Practical session Identification of carbohydrates Identification of glucose and fructose	2	---	1	---	---
12	Lecture Carbohydrates Introduction and Classification. Monosaccharides i. Synthesis ii.Cyclic structure of	2	2	---	---	---

	monosaccharides iii.Chemical reactions of monosaccharides activity Formative assessment (quiz3)					
	Practical session Synthesis of fructosasone	2	---	1	---	---
13	Lecture *Disaccharides Nomenclature and determination of the type of glycosidic linkage. *Polysaccharides Nomenclature and determination of the type of glycosidic linkage. *Drugs containing carbohydrates	2	2	----	---	---
	Practical exam			1	---	---
14	Lecture General discussion and revision	2	2	--	--	--
	Practical session Discussion and Assessment of activity	2	-	1	--	--
15	Final written exam					

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	--	--	--
3	Final Written Exam	Week 15	50	%50
	Final Practical/Clinical/... Exam	Week 13	25	%25
	Final Oral Exam	Week 15	10	%10
	Project (Self-learning Activity)	Weeks 10,12,14	5	%5
	Assignment (Formative assessment)	Weeks 4,10,12	-	-
	Other (Mention)	--	--	--

* The methods mentioned are examples, the organization may add and/or delete

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book of Pharmaceutical Organic Chemistry approved by the department 2026
	Other References	Chauden Jaidey, 2018, Organic Spectroscopy; Delhy. Francis A. Carey, 2009, Organic Chemistry; 9th Edition, McGraw- Hill T. W. Graham Solomons and Craig B. Fryhle, 2010, Organic Chemistry; 11th Edition, John Willy & Sons Inc, USA.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ http://chemwiki.ucdavis.edu/ www.Pubmed.Com and www.sciencedirect.com
	Learning Platforms (Links must be added)	https://shorturl.at/sar8D
	Other (to be mentioned)	---
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board, Conductometer
	Supplies	Chemicals and Glassware
	Electronic Programs	1. Microsoft office Microsoft teams
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	--

* The list mentioned is an example, the institution may add and/or delete depending on the nature of the course

Name and Signature
Course Coordinator

Prof. Dr. Zakaria Kamel Abdel Samii

Name and Signature Head of Department

Prof. Dr. Amany Mohamed Mohamed Elmahmoudy

**COURSE
SPECIFICATIONS**

**Pharmaceutical
Analytical Chemistry III**

Second Level– Semester 3

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmaceutical Analytical Chemistry III			
Course Code (according to the bylaw)	PA 303			
Department/s participating in delivery of the course	Analytical chemistry department			
	Theoretical	Practical	Other (specify)	Total
Number of credit hours/points of the course (according to the bylaw)	2 hrs/week	1 hrs/week	-	3 hrs/week
Course Type	Compulsory			
Academic level at which the course is taught	Level 2- semester 1			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Hanaa Saleh.			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, students will be able to illustrate different types of chemical pollutants of air and soil, different techniques for their determination, classification of oils and fats and their chemical composition.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.1.1.	Describe principles of redox reactions, potentiometry, conductometry, polarography and gravimetry.
		1.C1.1.2.	Describe various methods of sampling, samples preparation and standardization of water, oil and fat.
1.1.9	Implement pharmaceutical knowledge in proper handling, identification, extraction, design, preparation, analysis and quality assurance of different pharmaceuticals	1.C1.9.1.	Demonstrate the application of different techniques in quantitative analysis of different pollutants, fat and oil.
2.2.1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/ natural pharmaceutical materials.	2.C2.1.1.	Perform laboratory tests for examination of water, fat and oil.
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.C3.1.1	Handle and dispose chemicals safely.
4.1.3	Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.	4.C1.3.1.	Work as member of team.
		4.C1.3.2.	Manage time and perform a task within time limit.
4.1.5	Demonstrate critical thinking, problem-solving and decision-making abilities in a team.	4.C1.5.1	Develop problem solving skills.

3. Teaching and Learning Methods

- 1. Lectures (data show, board)**
- 2. Practical sessions**
- 3. Problem solving (Practical)**
- 4. Co-operative learning**
- 5. Self- Learning (Activity)**
- 6. Blended- learning (Activity)**

4. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignments/ Projects/...)	Other (to be determined)
1	Lecture <ul style="list-style-type: none"> - The importance of environmental analytical chemistry. - Different methods of sampling air and soil pollutants. 	2	2	-	-	-
	Practical session <p>Determination of O₃ and NO₂ (Demonstration)</p>					
2	Lecture <ul style="list-style-type: none"> -Different methods of sample preparation of environmental pollutants samples (air and soil). 	2	2	-	-	-
	Practical session <ul style="list-style-type: none"> - Determination of water acidity. 					
3	Lecture <ul style="list-style-type: none"> - Different types of chemical pollutants of air and techniques for their determination. 	2	2	-	-	-
	Practical session <ul style="list-style-type: none"> - Determination of water acidity. 					
4	Lecture <ul style="list-style-type: none"> - Different types of chemical pollutants of soil and techniques for their determination. -Difference between environmental and green chemistry and the principles of green chemistry. Formative assessment (quiz1)	2	2	-	-	-
	Practical session <ul style="list-style-type: none"> - Determination of water hardness by soda reagent and soap methods. 					
5	Lecture <ul style="list-style-type: none"> -- Physical examination of water. 	2	2	-	-	-
	Practical session <p>Determination of water hardness (complexometry)</p>					
6	Lecture <ul style="list-style-type: none"> - Chemical examination of water 	2	2	-	-	-

	Practical session Detection of metals, ammonia and nitrite in water.	2	-	1	-	-
7	Midterm exam					
8	Lecture Metals in water and interpretation of analytical results	2	2	-	-	-
	Practical session Limit test.	2	-	1	-	-
9	Lecture Water pollution and purification of water. Formative assessment (quiz 2)	2	2	-	-	-
	Practical session Determination of saponification value and rancidity test.	2	-	1	-	-
10	Lecture - Physical properties, composition and classification of oil and fat.	2	2	-	-	-
	Practical session - Determination of acid value and ester value	2	-	1	-*	-
11	Lecture - Chemical properties of oil and fat	2	2	-	-	-
	Practical session Revision	2	-	1	-	-
12	Lecture Rancidity	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture - Hydrogenation and analysis of butter fat.	2	2	-	-	-
	Practical session Discussion and assessment of activity	2	-	1	-	-
14	Lecture General discussion and revision	2	2	-	-	-
	Practical session Discussion and assessment of	2	-	1	-	-

	activity					
15		Final written exam				

* As part of a self-learning activity in pharmaceutical analytical chemistry III course, a part of practical session in week 10 was specified for the explanation of activity guidelines, rules and assessment rubric.

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical /Clinical/... Exam	12	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Week 13,14	5	5%
7	Assignment (Formative assessment)	Weeks 4, 9	-	-
8	Other (Mention)	-	-	-

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book "Pharmaceutical analytical chemistry III" approved by the analytical chemistry department book,2020
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	Other References	i- J. Mendham, et al., Vogel's Textbook of Quantitative Chemical Analysis (6 th edition);, Addison Wesley Publishing Co., 2000 ii- Daniel C. Harris, Quantitative Chemical Analysis (10 th Edition);. (2022). iii. Roger N. Reeve. Introduction to Environmental Analysis (1 st Edition); Wiley publishing., (2002).
	Electronic Sources (Links must be added)	https://www.ekb.eg/ http://chemwiki.ucdavis.edu/ www.Pubmed.Com and www.sciencedirect.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board, Conductometer
	Supplies	Chemicals and Glassware
	Electronic Programs	2. Microsoft office 3. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature

Course Coordinator

Prof. Dr. Hanaa Saleh.

Name and Signature

Head of Department

Prof. Dr. Amal Al-Gendi

**COURSE
SPECIFICATIONS**

Pharmacognosy II

Second Level– Semester 3

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacognosy II			
Course Code (according to the bylaw)	PG 303			
Department/s participating in delivery of the course	Pharmacognosy department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2 hrs/week	1 hr/week	-	3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 2/ Semester 3			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Afaf Abd El-Ghany			
Course Specification Approval Date	8/18/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, students will be able to illustrate macroscopical and microscopical characters and uses of medicinal fruits, herbs, subterranean organs, unorganized drugs in addition to drugs of marine and animal origin as well as identification of their different active constituents and adulteration.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.2.1	Describe morphological and microscopical characters of medicinal fruits, herbs, subterranean organs and unorganized drugs in addition to drugs of marine and animal origin
		1.C1.2.2	Identify different active constituents and medicinal uses of medicinal fruits, herbs, and subterranean organs and unorganized drugs in addition to drugs of marine and animal origin
1.1.3	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyse, and assure quality of synthetic/ natural pharmaceutical materials/products	1.C1.9.1	Outline adulteration of different medicinal fruits, herbs, subterranean organs and unorganized drugs in addition to drugs of marine and animal origin
2.2.1	Isolate, design, identify, synthesize, purify, analyse, and standardize synthetic/ natural pharmaceutical materials	2.C2.1.1	Handle microscope and equipment efficiently and identify medicinal plants.
		2.C2.1.2	Examine plant organs in entire and powdered form.
		2.C2.1.3	Determine the active constituents of the studied drugs qualitatively.
2.3.1	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labelled products, and other materials /products used in pharmaceutical field.	2.C3.1.1	Handle and dispose chemicals, solvents, natural waste, in an appropriate way avoiding any environmental hazards.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills	4.C1.1.1	Work effectively as part of a team.
		4.C1.3.1	Manage time and plan for work.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills	4.C2.2.1	Develop information technology skills.
		4.C2.2.2	Write and present reports.

4. Teaching and Learning Methods

1. Interactive lectures.
2. Practical sessions.
3. Self-learning. (Activity)
4. Co-operative learning
5. Field Visits (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/Assignment s/ Projects/ ...)	Other (to be determined)
1	Lecture Introduction for the fruits the of Description common characters of umbelliferous.	2	2	-	-	-
	Practical session Laboratory Safety Measures Dealing with Microscope. Morphology of some important fruits		-	1	-	-
2	Lecture Description of morphological and microscopical characters, constituents, uses, chemical tests and detection of adulteration in entire and powdered form of Fennel, Ammi visnaga and Ammi majus.	2	2	-	-	-
	Practical session of Identification in Fennel entire and powdered form.		-	1	-	-
3	Lecture Description of morphological and microscopical characters, constituents, uses, chemical tests and detection of adulteration in entire and powdered form of Coriander, Anise, Capsicum, Cocolynth, Lemon, bitter orange peel and Senna pods. Formative assessment (quiz1)	2	2	-	-	-
	Practical session Identification of Anise and Ammi visnaga, Ammi majus and coriander in		-	1	-	-

	entire and powdered form.					
4	Lecture Lemon and orange peel and other important medicinally used fruits: macro and, micro-morphology of the entire and powdered drugs, chemical identification. Unofficial fruits.	2	2	-	-	-
	Practical session Identification of Capsicum in entire and powdered form. Activity (report on different pharmaceutical fruits)		2	-	1	-*
5	Lecture Introduction to herbs. Study morphological and microscopical characters, constituents, uses, chemical tests and detection of adulteration in entire and powdered form of Lobelia.	2	2	-	-	-
	Practical session Morphology of some important herbs. Identification of Mentha and Thyme.		2	-	1	-
6	Lecture Morphological and microscopical Characters, Constituents, Uses, Chemical Tests, and Detection of Adulteration in Entire and Powdered Form of Peppermint, Thyme, Alfalfa, and Echinaceae. Unofficial herbs Formative assessment (quiz 2)	2	2	-	-	-
	Practical session Identification of Vinica Activity (report on medical uses of common		2	-	1	-*

	herbs)					
7	Midterm exam					
8	Lecture Introduction to subterranean organs. Study morphological, microscopical characters, constituents, uses, chemical tests and detection of adulteration in entire and powdered form of Liquorice	2	2	-	-	-
	Practical session micro-morphology, chemical powder, and identification of of Liquorice	2	-	1	-	-
9	Lecture Study morphological and microscopical characters, constituents, uses, chemical tests and detection of adulteration in entire and powdered form of senega and Ipeca Formative assessment (quiz 3)	2	2	-	-	-
	Practical session Macro-morphology, micro-morphology, chemical powder, and identification of Ginger	2	-	1	-	-
10	Lecture Study morphological and microscopical characters, constituents, uses, chemical tests and detection of adulteration in entire and powdered form of Rhubarb, Ginger.	2	2	-	-	-
	Practical session Identification of unorganized drugs (morphology and chemical tests)	2	-	1	-	-
11	Lecture	2	2	-	-	-

	Study morphological and microscopical characters, constituents, uses, chemical tests and detection of adulteration in entire and powdered form of Hydrastis, Valeriana., Unofficial rhizomes					
	Practical session Revision	2	-	1	-	-
12	Lecture Introduction to Unorganized drugs Study the preparation, collection, active constituents, uses and chemical tests of resins, oleo-resins	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture Study preparation, collection, active constituents, uses and chemical tests of balsams, latex, juice, extracts and gum.	2	2	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture Revision	2	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
15	Final written exam					

* As part of a self-learning activity in pharmacognosy II course, a part of practical session in week 10 was specified for the explanation of activity guidelines, rules and assessment rubric. Also, practical sessions in weeks 4, 6 and 14 were facilitated for students to present their reports on the various activity self-learning topics according to the announced student distribution on topics. Supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Mid-term Exam)	Week 8	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical/Clinical/... Exam	Weeks 12 and 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Assignments (Formative assessment)	Weeks 3, 6 and 9	-	-
7	Project (Self-learning Activity)	Weeks 4,6 and 14	5	5%
8	Other (Mention)	-	-	-

* The methods mentioned are examples, the organization may add and/or delete

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of "pharmacognosy II" approved by the pharmacognosy department 2025-2026.
	Other References	<p>1-Pharmacognosy, Fundamentals, Applications and Strategies by Simone Badal and Rupika Delgoda (2017)</p> <p>2- Trease and Evans, Pharmacognosy, 16thed.,Saunders company, Nottingham,U.K. Willium Charles Evans (2009).</p> <p>3- V. V. Sathibabu Uddandrao, G. Saravanan (2022). Therapeutic Plants: Recent Advances in the Use of Herbs as Alternative Medications. Bentham Science, Singapore.</p> <p>4- Raj K. Keservani, (2022). Nutraceutical Fruits: Overview and Disease Prevention. Apple Academic Press</p> <p>5- Janice, Glimn-Lacy and Peter B. Kaufman,</p>

		<p>Botany Illustrated, Introduction to plants, major groups, flowering plants families, Springer Netherlands2011 ..</p> <p>Article I. 6</p> <ul style="list-style-type: none"> - Martindale, "The extrapharmacopeia". 31st Edn., by James, E.F Reynolds. And Kathleen Parfitt, Royal Pharmaceutical Society, London (2007).
	Electronic Sources (Links must be added)	<p>https://www.ekb.eg/</p> <ul style="list-style-type: none"> - 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
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board, microscopes
	Supplies	Powdered drugus, chemicals and glassware
	Electronic Programs	Microsoft office
	Skill Labs/ Simulators	Microsoft teams
	Virtual Labs	-
	Other (to be mentioned)	-

* The list mentioned is an example, the institution may add and/or delete depending on the nature of the course

Name and Signature

Course Coordinator

Prof. Dr. Afaf Abd El-Ghany

Name and Signature
Head department

Prof. Dr. / Amal A. Al-Gendy

**COURSE
SPECIFICATIONS**

Biophysics

**Second Level– Semester 3
2025-2026**

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Biophysics			
Course Code (according to the bylaw)	MD303			
Department/s participating in delivery of the course	Biochemistry Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 hr/week	1 hr/week	-	2 hrs/week
Course Type	Faculty Requirement			
Academic level at which the course is taught	level 2/semester 3			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig University			
Name of Course Coordinator	Ass. Prof. Dr. Sally kamel hammad			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department council			

2. Course Overview (Brief summary of scientific content)

This course enables students to explain biological phenomena using the principles and techniques of physics and modify these techniques to help diagnose and treat various disorders.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.1.1	Identify the principles of biophysics including structure of the cell membrane and mechanisms of transport across the cell membrane.
		1.C1.1.2	Describe mechanisms of signal transduction and action of different types of receptors.
		1.C1.1.3	Illustrate the basis of biophysical techniques as ECG, Laser and Radiation and their different applications.
3.1.1	Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.	3.C1.1.1	Integrate knowledge of cell membrane composition to help recognize membrane defect and related disorders.
		3.C1.1.2	Interpret the biophysical basis of the different biological processes occurring in the human body.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.4.1	Demonstrate the ability to collect data from different resources and present it in an appropriate manner.

3. Teaching and Learning Methods

- Lectures
- Practical sessions
- Research assignment

4. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignments/Projects/...)	Other (to be determined)
1	Lecture - Plasma membrane	1	1	-	-	-
	Practical session - Introduction - Atomic Physics	2	-	1	-	-
2	Lecture Transport across the plasma membrane (Passive mechanisms)	1	1	-	-	-
	Practical session - Biochemical bonds	2	-	1	-	-
3	Lecture -Transport across the plasma membrane (Active mechanisms)	1	1	-	-	-
	Practical session - The Plasma membrane	2	-	1	-	-

4	Lecture - Channels and carriers Formative assessment (quiz 1)	1	1	-	-	-
	Practical session - Transport across the plasma membrane	2	-	1	-	-
5	Lecture -Signal Transduction and receptors	1	1	-	-	-
	Practical session -Energy for transport	2	-	1	-	-
6	Lecture - Receptors and action potential	1	1	-	-	-
	Practical session - Ion channel	2	-	1	-	-
7	Midterm exam					
8	Lecture Biophysical basis of ECG - and blood pressure measurement (electrochemical gradient and membrane action potential – action potential in the heart)	1	1	-	-	-
	Practical session -Receptors	2	-	1	-	-
9	Lecture - Action potential in the heart (cont.) (ECG technique and interpretation – blood pressure measurement)	1	1	-	-	-
	Practical session - Water homeostasis	2	-	1	-	-

10	Lecture - Atom and radiation (the quantum model of the atom – electromagnetic spectrum – radioactive decay – types of radiation)	1	1	-	-	-
	Practical session -Measuring blood pressure	2	-	1	-*	-
11	Lecture - Quantification of radiation (sources of radiation – radiation risks – application of radiology) Formative assessment (quiz 2)	1	1	-	-	-
	Practical session - Action potential	2	-	1	-	-
12	Lecture - Laser technology (laser beam properties and generation)	1	1	-	-	-
	Practical exam Discussion and Assessment of activity	2	-	1	-	-
13	Lecture - Laser types, hazards and applications	1	1	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
14	Lecture - Revision and open discussion	1	1	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
15	Final written exam					

* As part of a self-learning activity in Biophysics, a part of practical session in week

12,13,14 was specified for the explanation of activity guidelines, rules and assessment rubric. Also, practical sessions in weeks 13 and 14 were facilitated for students to present their reports on the various activity self-learning topics according to the

announced student distribution on topics. Supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical/Clinical/... Exam	Week 12	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Week 12, 13,14	5	5%
7	Assignment (Formative assessment)	Week 4, 11	-	-
8	Other (Mention)	-	-	-

* The methods mentioned are examples, the organization may add and/or delete

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Course Notes <ul style="list-style-type: none"> Student book of Biophysics approved by biochemistry department 2025-2026 Practical note of Biophysics approved by biochemistry department 2025-2025 Essential books <ul style="list-style-type: none"> Biophysics in the Cell: For Students of the Natural Sciences, Thomas Bornschlögl , Hendrik Dietz (2025) Biophysics: Physical Processes Underlying the Living State, Wayne F. Reed (2025) Ion Channels in Biophysics and Physiology, Lei Zhou (2022) Metabolism and Medicine: The Physics of Biological Engines,Brian Fertig 1st edition (2022) Biophysics for Beginners: A Journey through the Cell Nucleus, Helmut Schiessel 2nd edition (2021) The biophysics of cell membranes-Epand , Richard M, Ruysschaert ,
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		<p>Jean Marie (2018)</p> <ul style="list-style-type: none"> • Introduction to experimental Biophysics,2ndedition-Jayl Nadeau (2018) • Membrane biophysics: New insights and methods -Hongda Wang , Guohuili (2018)
	Other References	<ul style="list-style-type: none"> • Biophysics: A Student's Guide to the Physics of the Life Sciences and Medicine, William C. Parke (2021) • Biophysics and neurophysiology of the six sense – NimaRezaei , AmeneSaghazadeh.(2019)
	Electronic Sources (Links must be added)	<ul style="list-style-type: none"> • www.Pubmed.Com • www.sciencedirect.com
	Learning Platforms (Links must be added)	https://teams.microsoft.com/l/channel/19%3A5cf4ed1e90044c9ab3e2b03a9525b31b%40thread.tacv2/Biochemistry%20II?groupId=9354991d-3564-4dcb-89a8-dfc9c5f8a502&tenantId=9345a4cc-a702-4d54-b38a-a9dff465585
	Other (to be mentioned)	---
Supportive facilities & equipment for teaching and learning *		
	Devices/Instruments	- whiteboard - Overhead projectors - Data show
	Supplies	---
	Electronic Programs	- Microsoft office - Microsoft teams
	Skill Labs/ Simulators	---
	Virtual Labs	--
	Other (to be mentioned)	--

* The list mentioned is an example, the institution may add and/or delete depending on the nature of the course

**Name and Signature
Course Coordinator**

Ass.Prof. Dr. Sally kamel
Hammad

**Name and Signature
Head of Department**

Ass.Prof. Dr. Rana Eissa

**COURSE
SPECIFICATIONS**

**Physiology and
Pathophysiology**

**Second Level– Semester 3
2025-2026**

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Physiology and Pathophysiology			
Course Code (according to the bylaw)	MD 304			
Department/s participating in delivery of the course	Pharmacology and Toxicology			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 2 hrs/week	Practical 1 hrs/week	Other (specify) -	Total 3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 2- semester 3			
Academic Program	Bachelor of Pharmacy -Pharm D			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Ass.Prof.Dr.Shaimaa samy			
Course Specification Approval Date	18-8-2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

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

- On completion of the course, the student will be able to understand human physiology and the pathophysiological mechanisms underlying major diseases.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.3.1	Describe the physiological functions of major body systems, including the cardiovascular, renal, respiratory, endocrine, gastrointestinal, lymphatic, nervous, and immune systems.
		1.C1.3.2	Identify the key mechanisms of neuromuscular and synaptic transmission and autonomic nervous system regulation.
		1.C1.3.3	Explain the pathophysiological changes that occur in common diseases.
3-1-1	Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.	3.C1.1.1	Apply principles of body function regarding their correlation with diseases and demonstrate the ability to integrate physiological and pathophysiological data into therapeutic decision-making.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
3-1-3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.4.1	Interpret symptoms/lab data to identify physiological/pathological conditions.
4-1-2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team	4.C1.1.1	Work effectively in a team
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Write and present activities using advanced information technology skills.

4. Teaching and Learning Methods

1. Lectures (data show , board)
2. Practical sessions
3. Co-operative Learning (Activity)
4. Self -Learning (Activity)

5. Course schedule :

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignment s/ Projects/...)	Other (to be determined)
1	Lecture -Cell physiology and cancer	2	2	-	-	-
	Practical session	2	-	1	-	-

	- Lab safety rules - Pathophysiology of cancer					
2	Lecture Peripheral nervous system	2	2	-	-	-
	Practical session Basic principles of case studies on PNS	2	-	1	-	-
3	Lecture Autonomic nervous system	2	2	-	-	-
	Practical session Pathophysiology of Autonomic nervous system	2	-	1	-	-
4	Lecture - Cardiovascular system-Part I Formative assessment (quiz 1)	2	2	-	-	-
	Practical session Pathophysiology of Hypertension Pathophysiology of Heart failure Pathophysiology of Angina	2	-	1	-	-
5	Lecture Cardiovascular system physiology- Part II The lymphatic system and immunity	2	2	-	-	-
	Practical session Pathophysiology of Hypertension Pathophysiology of Heart failure Pathophysiology of Angina	2	-	1	-	-
6	Lecture Nerve and muscle	2	2	-	-	-
	Practical session part 2 Pathophysiology of Nerve and muscle	2	-	1	-	-
7	Midterm exam					
8	Lecture - Central nervous system	2	2	-	-	-
	Practical session Pathophysiology of Alzheimer, parkinsonism, and Epilepsy	2	-	1	-	-
9	Lecture Endocrine-Part I Formative assessment (quiz 2)	2	2	-	-	-
	Practical session Pathophysiology of hormonal disorders	2	-	1	-	-
10	Lecture Endocrine-Part II	2	2	-	-	-

	Practical session Pathophysiology of hormonal disorders	2	-	1	-	-
11	Lecture Respiratory System	2	2	-	-	-
	Practical session Pathophysiology of Asthma Pathophysiology of Cough	2	-	1	-	-
12	Lecture GIT Formative assessment (quiz 3)	2	2	-	-	-
	Practical sessions Pathophysiology of Hepatitis, Ulcer, Diarrhea, Constipation Activity (presentation)	2	-	1	-	-
13	Lecture Renal system	2	2	-	-	-
	Practical sessions Pathophysiology of renal failure Activity (presentation)	2	-	1	-	-
14	Lecture General discussion and revision	2	2	-	-	-
	Practical Exam	2		1		
15	Final written exam					

6. Methods of students' assessment

No.	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50 %
4	Final Practical /Clinical/... Exam	Week 14	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Week 12,13	5	5%
7	Assignment (Formative assessment)	Week 4,9,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	<ul style="list-style-type: none"> - Student book of "Physiology and Pathophysiology" approved by the pharmacology and toxicology department 2025-2026.
	Other References	<ol style="list-style-type: none"> 1. Essentials of pathophysiology: concepts of altered health states: Wolters Kluwer Philadelphia. Porth, C., & Gaspard, K. J. (2015), 3rd ed. 2. Essentials of anatomy and physiology: FA Davis. Scanlon, V. C., & Sanders, T. (2018), 8th ed.
	Electronic Sources (Links must be added)	<ul style="list-style-type: none"> - Advanced Physiology and Pathophysiology: Essentials for Clinical Practice - www.springerpub.com/advanced-physiology-and-pathophysiology-9780826177070.html
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy-Zagaig University for students</u>	<p>http://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin</p>
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	<ul style="list-style-type: none"> - White boards, data show, ai conditioned classroom - Well-equipped labs.
	Supplies	-
	Electronic Programs	<ol style="list-style-type: none"> 4. Microsoft office 5. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator
Ass.Prof.Dr. Atef Saad

Name and Signature
Head of Department
Prof. Dr. Islam Ahmed

**COURSE
SPECIFICATIONS**

**General Microbiology
and Immunology**

**Second Level– Semester 3
2025-2026**

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	General Microbiology and Immunology			
Course Code (according to the bylaw)	PM 301			
Department/s participating in delivery of the course	Department of Microbiology and Immunology			
	Theoretical	Practical	Other (specify)	Total
Number of credit hours/points of the course (according to the bylaw)	2 hrs/week	1 hrs/week	-	3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 2- semester 2			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof.Dr. Ashraf Kadry			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

This course provides foundational knowledge in microbiology and immunology. It covers the structure, function, diversity, and metabolism of microorganisms, including bacterial growth, reproduction, and pathogenesis. Key topics include membrane transport mechanisms, metabolic pathways, and microbial genetics (DNA/RNA structure, replication, and mutations). In immunology, the course introduces both innate and adaptive immunity, antigen-antibody interactions, cellular immune responses, hypersensitivity, immunodeficiencies, autoimmunity, and organ transplantation. Emphasis is placed on host-parasite interactions and protective immune mechanisms.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.3.1	Understand the classification, structure, and growth of microorganisms including bacteria, viruses, fungi, and protozoa and explain genetic variation and gene transfer in bacteria.
		1.C1.3.2	Differentiate between innate and acquired immunity and understand the mechanisms of humoral and cell-mediated immune responses. Identify the roles and types of immune cells and organs.
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8.1	Identify and use correct microbiological and immunological terms to describe conditions involving hypersensitivity, autoimmunity, and immunodeficiency for effective clinical or academic communication.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
3.1.3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases	3.C1.3.1	Perform and interpret Gram staining, acid-fast staining, and biochemical tests for bacterial, fungal, and protozoal identification. Interpret abnormal lab results that exceed pharmacy decision-making limits.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.3.1	Demonstrate effective time management in planning, prioritizing, and executing microbiology and immunology-related tasks, ensuring timely completion of theoretical, practical, and reporting activities.
		4.C1.4.1	Retrieve, assess, and integrate information from diverse scientific sources to support learning and problem-solving in microbiology and immunology.

4. Teaching and Learning Methods

1. Lectures
2. Practical sessions
3. Internet search and self-learning
4. Others: videos

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignments/Projects/...)	Other (to be determined)

1	Lecture <ul style="list-style-type: none"> General introduction to microbiology and historical review Introduction to immunology 	2	2	-	-	-
	Practical session <ul style="list-style-type: none"> Laboratory safety measures Microscopy and general terms of microbiology 	2	-	1	-	-
2	Lecture <ul style="list-style-type: none"> Description of microorganisms Classification and types of Microorganisms Introduction to immunology 	2	2	-	-	-
	Practical session <ul style="list-style-type: none"> Microscopical examination of Bacteria: preparation and staining of smear and simple stain 	2	-	1	-	-
3	Lecture <ul style="list-style-type: none"> Brief description of viruses, fungi and protozoa Immunity – innate immunity Formative assessment (quiz1)	2	2	-	-	-
	Practical session <ul style="list-style-type: none"> Differential stains: Gram-stain 	2	-	1	-	-
4	Lecture <ul style="list-style-type: none"> Bacteria: description and classification Cells of immune response Immunogens or antigens	2	2	-	-	-
	Practical session <ul style="list-style-type: none"> Differential stains: Gram-stain of mixtures of microorganisms 	2	-	1	-	-
5	Lecture <ul style="list-style-type: none"> Anatomy and structure of bacterial cells Acquired immune response: Cell mediated immunity 	2	2	-	-	-

	Practical session <ul style="list-style-type: none">Differential stain: Acid-fast stain (Ziehl Neelsen stain)	2	-	1	-	-
6	Lecture <ul style="list-style-type: none">Growth and cultivation of bacteria, bacterial growth curveHumoral immune response And Cytokines	2	2	-	-	-
	Practical session <ul style="list-style-type: none">Spore stain	2	-	1	-	-
7	Midterm exam					
8	Lecture <ul style="list-style-type: none">Microbial metabolismAgglutination and complement fixation reactions	2	2	-	-	-
	Practical session <ul style="list-style-type: none">Cultivation of bacteria: types of common culture media and growth conditions	2	-	1	-	-
9	Lecture <ul style="list-style-type: none">Microbial metabolism	2	2	-	-	-
	Practical session Biochemical activities and identification of bacteria	2	-	1	-	-
10	Lecture <ul style="list-style-type: none">Microbial metabolismHypersensitivity reactions Activity Formative assessment (quiz 2)	2	2	-	-*	-
	Practical session <ul style="list-style-type: none">Serological reactions (Precipitation reactions)	2	-	1	-	-
	Lecture <ul style="list-style-type: none">Microbial geneticsTransplantation immunology	2	2	-	-	-
11	Practical session <ul style="list-style-type: none">Serological reactions	2	-	1	-	-

	(Agglutination reactions)					
12	Lecture <ul style="list-style-type: none">Transcription and Protein synthesis Autoimmune diseases	2	2	-	-	-
	Practical session <ul style="list-style-type: none">Serological reactions (Complement fixation reaction)	2	-	1	-	-
13	Lecture <ul style="list-style-type: none">Genetic variation Genetic Transfer among bacteria	2	2	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture <ul style="list-style-type: none">Final Revision and open discussion	2	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
15	Final written exam					

* As part of a self-learning activity in General Microbiology and Immunology course, a part of the lecture in week 10 was specified for the explanation of activity guidelines, rules and assessment rubric. Also, practical sessions in week 14 was facilitated for students to present their reports on the various activity self-learning topics according to the announced student distribution on topics. Supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical /Clinical/... Exam	Week 13	25	25%

5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Weeks 10,14	5	5%
7	Assignment (Formative assessment)	Weeks 3,10	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of "General Microbiology and Immunology" approved by the Department of Microbiology and Immunology 2025-2026.
	Other References	3. - Willey, J. M., Sherwood, L. M., & Woolverton, C. J. (2019). Prescott's Microbiology (11th ed.). McGraw-Hill Education. 4. Abbas, A. K., Lichtman, A. H., & Pillai, S. (2016). Basic immunology: Functions and disorders of the immune system (5th ed.). Elsevier/Saunders.
	Electronic Sources (Links must be added)	http://canadianpharmacistsletter.therapeuticresearch.com/ce/ceCourse.asp https://www.ekb.eg/
	Learning Platforms (Links must be added) Electronic platform of Faculty of Pharmacy- Zagazig University for students	http://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and	Devices/Instruments	Computer, board, and Light microscopes
	Supplies	Culture media, Petri dishes, Bacteriological loops, Chemicals, and Glassware
	Electronic Programs	6. Microsoft office 7. Microsoft teams

learning *	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature

Course Coordinator

Prof.Dr. Ashraf Kadry

Name and Signature

Head of Department

Prof.Dr. Momen Askora

**COURSE
SPECIFICATIONS**

Pharmaceutics I

**Second Level– Semester 3
2025-2026**

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmaceutics I			
Course Code (according to the bylaw)	PT 303			
Department/s participating in delivery of the course	Pharmaceutics Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2hrs/week	1hr/week	-	3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Second level –Semester 3			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Azza Ali Hasan			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

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. It is also concerned with all manufacturing formulations aspects, packaging, storage and stability of liquid dosage forms including solutions (aqueous and non-aqueous), suspensions, emulsions and

colloids with emphasis on the technology and pharmaceutical rationale fundamental to their design and development. The incompatibilities occurring during dispensing are also considered.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.2.1	Illustrate the systems of measurements, the properties and preparation liquid dosage forms (solutions, emulsion, suspension and colloids).
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.C2.2.1	Apply different methods for preparation of solutions, emulsion, suspension and colloids.
		2.C2.3.1	Solve problems concerning physical and chemical incompatibilities that may occur during drug manufacture and dispensing.
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.C3.1.1	Handle and dispose chemicals safely
2.3.2	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.	2.C3.2.1	Apply GLP guidelines for safe handling and disposal of pharmaceuticals .

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes	
		Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Solve pharmaceutical calculations problems

4. Teaching and Learning Methods

- 1.** Lectures (data show, board)
- 2.** Practical sessions
- 3.** Problem solving (Practical)
- 4.** Self- Learning (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignments/Projects/...)	Other (to be determined)
1	Lecture Fundamentals of measurements and calculations - Arabic and Roman Numerals Systems of Measurement - The Metric System - Apothecary and Avoirdupois systems (The Common Systems) - Household system	2	2	-	-	-
	Practical session - Safety guidelines	2	-	1	-	-
2	Lecture Dilution and concentration of Solutions - Reducing and Enlarging Formulas, - percentage and ratio strength problems - Calculation of Doses for Children	2	2	-	-	-
	Practical session Pharmaceutical calculations: Measurement Systems	2	-	1	-	-
3	Lecture - Introduction to liquid dosage forms Solutions: Advantages and disadvantages Of Solutions, Aqueous liquid dosage forms pharmaceutical Solutions	2	2	-	-	-
	Practical session Pharmaceutical calculations: Dilution and concentration of Solutions Reducing and Enlarging Formulas, percentage and ratio strength problems	2	-	1	-	-
4	Lecture Solutions: Non aqueous liquid dosage forms Sweet and/or viscid liquid dosage forms, Manufacture of	2	2	-	-	-

	solutions Formative assessment (quiz1)					
	Practical session -Preparation of aromatic water -Preparation of Simple Mixture	2	-	1	-	-
5	Lecture Emulsion: General description, Advantages and disadvantages of pharmaceutical emulsions, emulsion instability and theories of emulsification	2	2	-	-	-
	Practical session -Preparation Ammonium Chloride Cough Mixture -Preparation of Ear drops	2	-	1	-	-
6	Lecture Emulsion: Formulation of pharmaceutical emulsions, Excipients used in pharmaceutical emulsions, Manufacture of emulsions	2	2	-	-	-
	Practical session -Methods of preparation of emulsions a- wet method b- dry method	2	-	1	-	-
7	Lecture Suspension: Introduction, advantages and disadvantages of Suspension, Reasons for preparing suspension, Characters of ideal suspension	2	2	-	-	-
	Practical session Preparation of Castor oil emulsion	2	-	1	-	-
8	Midterm exam					
9	Lecture Suspension: Formulation and evaluation of suspensions, Stability of suspensions	2	2	-	-	-
	Practical session Preparation of Mineral oil emulsion	2	-	1	-	-

10	Lecture Colloids: introduction, pharmaceutical application of colloids, Types of colloidal systems Formative assessment (quiz 2)	2	2	-	-	-
	Practical session Preparation of Suspension, Determination of sedimentation rate	2	-	1	-*	-
11	Lecture Colloids: Preparation of colloids, purification, Properties of colloids (kinetic, optical, electrical)	2	2	-	-	-
	Practical Exam	2	-	1	-	-
12	Lecture -Stability of colloids - Electrical Double Layer, Nernst and Zeta Potentials, Importance of Zeta Potential	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture - Incompatibility: definition, types, examples, importance, intentional incompatibilities.	2	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
14	Lecture General discussion and revision	2	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
15	Final written exam					

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Mid-term Exam)	Week 8	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%

4	Final <u>Practical</u> /Clinical/... Exam	Weeks 11 and 12	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (<u>Self-learning Activity</u>)	Weeks 13,14	5	5%
7	Assignment (<u>Formative assessment</u>)	Weeks 4,10	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of "Pharmaceutics I" approved by Pharmaceutics department 2025-2026.
	Other References	<ul style="list-style-type: none"> - Stoklosa and Ansel's Pharmaceutical Calculations (16th Edition) Author: Shelly J. Stockton, Publisher: Wolters Kluwer: 2021 - Introduction to Pharmaceutical Calculations (4th Edition), Authors: Judith A. Rees, Ian Smith, Jennie Watson, Publisher: Pharmaceutical Press: 2015 <ul style="list-style-type: none"> - Pharmaceutical Dosage Forms and Drug Delivery (4th Edition, 2024), Authors: Ram I. Mahato, Ajit S. Narang, Virender Kumar, Publisher: Taylor & Francis: 2024 - Dosage Forms, Formulation Developments and Regulations: Recent and Future Trends in Pharmaceutics, Volume 1 (2023), Editors: Amit Kumar Nayak, Kalyan Kumar Sen, Publisher: Academic Press: 2023 - Incompatibilities in Prescriptions for Students in Pharmacy and Medicine and Practicing Pharmacists, Author: Edsel Alexander Ruddiman, Publisher: Legare Street Press: 2023 - Remington: The Science and Practice of Pharmacy, 23rd Edition, published on October 30, 2020, by Academic Press (Elsevier). - Pharmacy Calculations for Technicians is the 7th Edition, authored by Skye A. McKennon, PharmD, BCPS, and published in 2021
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com and

		www.sciencedirect.com
	Learning Platforms (Links must be added)	https://shorturl.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board
	Supplies	Chemicals and Glassware
	Electronic Programs	8. Microsoft office 9. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature

Course Coordinator

Prof. Dr. Azza Ali Hasan

Name and Signature

Head of Department

Prof. Dr. Shreen Sabry



وحدة ضمان الجودة



Semester 4

**COURSE
SPECIFICATIONS**

Biochemistry I

Second level – Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Biochemistry I			
Course Code (according to the bylaw)	PB 402			
Department/s participating in delivery of the course	Biochemistry			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 2	Practical 1	Other (specify) -	Total 3
Course Type	Faculty requirement			
Academic level at which the course is taught	Level two/ semester four			
Academic Program	Bachelor of pharmacy (Pharm D)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig University			
Name of Course Coordinator				
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, students will be able to identify chemistry and functions of carbohydrate, lipids, proteins, enzymes and cellular organelles, the principles of bioenergetics, oxidative phosphorylation, porphyrin and nucleotides metabolic pathways.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1-1-1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioural, administrative, and clinical sciences.	1.C1.3.1	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.
2-3-1	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radio-labelled products, and other materials/products used in pharmaceutical field.	2.C3.1.1	Handle basic laboratory equipment, biological samples and chemicals effectively and safely.
3-1-1	Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.	3.C1.1.1	Clarify the correlation between body function and biochemical pathways with different diseases.
3-1-3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.3.1	Perform qualitative and quantitative tests to identify different types of proteins and lipids and to measure and interpret blood glucose level.
4-2-2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.2.1	Write and present reports effectively and develop self-learning skills.

4. Teaching and Learning Methods

1. Lectures
2. Practical sessions
3. Research Activity

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignments/Projects/...)	Other (to be determined)
1	<ul style="list-style-type: none"> - Lecture -Definition and functions of carbohydrates. -Classification of carbohydrates (monosaccharides, disaccharides, oligosaccharides examples with structure). 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session -Laboratory Safety measures 		2	-	1	-
2	<ul style="list-style-type: none"> - Lecture - Physical and chemical properties of carbohydrates. -Polysaccharides: examples and classification 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session -Introduction on practical biochemistry. 		2	-	1	-
3	<ul style="list-style-type: none"> - Lecture -Definition and function of lipids - Classification of lipids 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session - Separation of serum and plasma. 		2	-	1	-
	Formative assessment quiz 1				-	-
4	<ul style="list-style-type: none"> - Lecture -Distribution of lipids in the body - Types of fatty acids and essential fatty acids 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session -Qualitative tests for Lipid 		2	-	1	-
5	<ul style="list-style-type: none"> - Lecture - Structure and classification of amino acids - Acidic and basic properties of amino acids 	2	2	1	-	-
	<ul style="list-style-type: none"> - Practical session - Qualitative tests for proteins 		2	-	1	-

	Formative assessment quiz 2				-	-
6	<ul style="list-style-type: none"> - Lecture - Structure of proteins - Functions of proteins - Plasma proteins 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session - CHO chemistry 	2	-	1	-	-
7	<ul style="list-style-type: none"> - Lecture - Biological oxidation. - Substrate level phosphorylation -Oxidative phosphorylation. 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session - Quantitative determination of glucose 	2	-	1	-	-
8	-Midterm Exam					
9	<ul style="list-style-type: none"> - Lecture - Electron transport chain -Uncouplers - Energy gain from glucose oxidation in cells. 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session -Qualitative test for carbohydrates 	2	-	1	-	-
10	<ul style="list-style-type: none"> - Lecture -Enzymes structure -Properties of enzymes -Mechanism of actions enzymes and coenzymes 	2	2	1	-	-
	<ul style="list-style-type: none"> - Practical session -Activity 	2	-	1	-	-
11	<ul style="list-style-type: none"> - Lecture - Factors affecting reaction velocity - Inhibition of enzyme activity - Regulation of enzyme activity -Correlation of enzymes with diseases 	2	2	-	-	-
	<ul style="list-style-type: none"> - Practical session -Activity 	2	-	1	-	-
12	<ul style="list-style-type: none"> - Lecture -Porphyrins types. -Heme synthesis. -Regulation of heme synthesis. -Porphyria. 	2	2	-	-	-
	-Practical Exam 1	2	-	1	-	-
13	- Lecture	2	2	-	-	-

	-Hemoglobin types. -Abnormal hemoglobin types. -Hemoglobinopathies.					
	- Practical Exam 2	2	-	1	-	-
14	- Lecture - Revision and open discussion	2	2	-	-	-
	- Practical session -Discussion on activity*	2	-	1	-*	-
15	Final written Exam					

* As part of self-learning activity in biochemistry 1, practical sessions in week 14 were facilitated for students to present their reports on various topics. These sessions were designed to go beyond more presentations, supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Midterm exam)(Semester work)	Week 8	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical /Clinical/... Exam	Week 12&13	25	25%
5	Final Oral Exam	Week 15	10	15%
6	Project (Self learning Activity)	Week 10&11&14	5	5%
7	Assignments (formative assessment)	Week 3&5	-	-
8	Other (Mention)	-	-	-

* The methods mentioned are examples, the organization may add and/or delete

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references,	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	- Student book of Biochemistry I approved by biochemistry department (2025-2026). -Practical notes of Biochemistry I approved by biochemistry department (2025-2026).
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etc.) *	Other References	<ol style="list-style-type: none"> 1. Marks' basic medical biochemistry: a clinical approach (third edition); Lieberman M., MarksA.D., Smith C.M .(2020). 2. Lehninger principles of biochemistry (seventh edition); NelsonD.L., CoxM.M.,FreemanW.H. (2022). 3. Lippincott's Illustrated Reviews: Biochemistry (Seventh edition); FerrierD.R (2022) 4. Marks' basic medical biochemistry: a clinical approach (fifth edition); Lieberman M., Marks A.D., Peet MD, Alisa (2021). 5. Egyptian J. of biochem. and molecular biology. 6. Arab J. of Laboratory Medicine, 7. J. of Cardiovascular diseases.
	Electronic Sources (Links must be added)	<ul style="list-style-type: none"> • www.ekb.com • www.Pubmed.Com • www.sciencedirect.com
	Learning Platforms (Links must be added)	https://adminph.eps.zu.edu.eg/Views/AdminViews/Login
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	<ul style="list-style-type: none"> • Computer • White boards • Data show • Centrifuge • Spectrophotometer
	Supplies	<ul style="list-style-type: none"> • Chemicals • Glassware
	Electronic Programs	<ul style="list-style-type: none"> -Microsoft office - Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

* The list mentioned is an example, the institution may add and/or delete depending on the nature of the course

Name and Signature

Course Coordinator

Name and Signature
Head department
Ass.Prof.Dr. Rana Eissa

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Instrumental Analysis			
Course Code (according to the bylaw)	PA 404			
Department/s participating in delivery of the course	Analytical chemistry department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 2 hrs/week	Practical 1 hrs/week	Other (specify) -	Total 3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 2- semester 2			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Assoc. Prof. Dr. Sara Anis.			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, students will be able to illustrate the principle of different instrumental techniques including, spectrophotometry, fluorimetry, and chromatography for the quantitative analysis of various chemical compounds.

Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.2.1.	Mention principles and theories of spectrophotometry, spectroflourimetry, atomic absorption spectrometry and chromatography.
		1.C1.2.2.	Illustrate applications of spectrophotometry, spectroflourimetry, atomic absorption spectrometry and chromatography.
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.	2.C2.4.1.	Describe the principles of various instrumental techniques.
2.2.5	Select the appropriate methods for synthesis and analysis of different pharmaceuticals.	2.C2.5.1	Select the most appropriate instrumental method for analysis of different compounds.
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.C3.1.1.	Handle and dispose chemicals safely.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
4.1.5	Demonstrate critical thinking, problem-solving and decision-making abilities in a team.	4.C1.5.1	Demonstrate problem solving, and decision-making skills.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.2.1	Implement writing and presentation skills.

3. Teaching and Learning Methods

1. Lectures (data show, board)
2. Practical sessions
3. Problem solving (Practical)
4. Co-operative learning
5. Self- Learning and presentations (Activity)

4. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/Assignments/Projects/ ...)	Other (to be determined)
1	Lecture Introduction to instrumental methods of analysis.	2	2	-	-	-
	Practical session Safety guidelines	2	-	1	-	-
2	Lecture - Spectrophotometry Electromagnetic radiation, light as energy, types of electronic transitions, laws of light absorption and Bouguer-lambert's law.	2	2	-	-	-
	Practical session - Spectroscopic principle and instrumentation	2	-	1	-	-
3	Lecture -Spectrophotometry Absorption spectrum, chromophore, auxochrome, bathochromic shift, hypsochromic shift, hypochromic effect and hyperchromic effect, effect of pH on absorption spectra.	2	2	-	-	-
	Practical session - Determination of λ_{max} .	2	-	1	-	-
4	Lecture - Spectrophotometry Colorimetry, general requirements of the coloured product, general requirement of an ideal chromogen. Formative assessment (quiz1)	2	2	-	-	-
	Practical session - Determination of KMnO_4 spectrophotometrically	2	-	1	-	-
5	Lecture -Spectrophotometer, light source, monochromator, sample compartment,	2	2	-	-	-

	light detector, types of transducer, and signal processor (meter or recorder). -Application of spectrophotometry. Practical session -Beer's law, regression equation -Calibration curve for CuSO ₄ via reaction with pot.ferrocyanide spectrophotometrically.					
6	Lecture -Spectrofluorimetry Luminescence, molecular emission, theory of fluorescence and phosphorescence, fluorescence spectra. Instrumentation, advantage of spectrofluorimetry factors affecting fluoresce intensity, applications of spectrofluorimetry.	2	-	1	-	-
	Practical session Determination of molar ratio between CuSO ₄ and pot. ferrocyanide spectrophotometrically using continuous variation method	2	2	-	-	-
7	Lecture Atomic absorption spectrometry -Comparison between atomic and molecular atomic spectra, Theory of atomic absorption.	2	2	-	-	-
	Practical session Chromatographic chromatograms	2	-	1	-	-
8	Midterm exam					
9	Lecture -Atomic absorption spectrometry Instrumentation and Quantitative determination methods. Theory of flame emission, instrumentation and applications. Formative assessment (quiz 2)	2	2	-	-	-

	Practical session Chromatography Chemical separation parameters	2	-	1	-	-
10	Lecture Chromatography Introduction, comparison between the classical and modern LC.	2	2	-	-	-
	Practical session - Activity	2	-	1	-*	-
11	Lecture Chromatography Theoretical aspects, principles of chromatography, parameters of chromatography, techniques of chromatography.	2	2	-	-	-
	Practical session Revision	2	-	1	-	-
12	Lecture Chromatography Gas chromatography, principles, instrumentation, factors governing the separated compounds, detectors for GC, application of GC, HPLC and types of HPLC.	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture Open discussion	2	2	-	-	-
	Practical session Discussion and assessment of activity	2	-	1	-	-
14	Lecture General revision	2	2	-	-	-
	Practical session Discussion and assessment of activity	2	-	1	-	-
15	Final written exam					

* As part of a self-learning activity in **Instrumental Analysis** course, a part of practical session in week 10 was specified for the explanation of activity guidelines, rules and assessment rubric.

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Mid-term Exam)	Week 8	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical/Clinical/... Exam	12	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Weeks 13,14	5	5%
7	Assignment (Formative assessment)	Weeks 4,9	-	-
8	Other (Mention)	-	-	-

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	<p>1- Course Notes Lecture notes and department notes</p> <p>2- Essential Books (Text Books) G. Svehla "Vogel's Textbook of Quantitative Inorganic Analysis including Elementary Instrumental Analysis" 4th edn, Longman Inc., New York (1990).</p>
	Other References	i- F. Rouessac, A. Rouessac "Chemical Analysis: Modern Instrumental Methods and Techniques" 4th edn, John Wiley & Sons, Ltd., New York (1998). ii- Stuart A. Burman "Instrumentation in Analytical Chemistry" American Chemical Society, Washington (1992).
	Electronic Sources (Links must be added)	Analytical Letters Journal and Analyst Journal
	Learning Platforms (Links must be added)	https://shorturl.at/sar8D

	<u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board, Conductometer
	Supplies	Chemicals and Glassware
	Electronic Programs	1. Microsoft office 2. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature

Course Coordinator

Assoc. Prof. Dr. Sara Anis.

Name and Signature
Head of Department

Prof.Dr.Amal Al-Gendi

**COURSE
SPECIFICATIONS**

Pharmaceutics II

Second level – Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmaceutics II			
Course Code (according to the bylaw)	PT 404			
Department/s participating in delivery of the course	Pharmaceutics Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 2hrs/week	Practical 1hr/week	Other (specify) -	Total 3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Second level –Semester 4			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Azza Ali Hasan			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

This course covers the structure and function of the skin, target area of treatment after topical application to skin, basic principles of diffusion through membranes and factors affecting percutaneous absorption, enhancement of skin penetration, transdermal drug delivery systems (TDDS). It also describes the principles and techniques involved in the formulation and manufacturing of traditional dermatological semisolid dosage forms (creams, ointments, gels and pastes).

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1-1-1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.2.1	Illustrate the structure, function of the skin and the properties of different dosage forms including; Creams, Ointments, Gels, Pastes and Transdermal drug delivery systems (TDDS).
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.C2.2.1	Describe different methods for preparation of semisolid preparations and Transdermal therapeutic systems.
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.C3.1.1	Handle and dispose chemicals safely

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
2-3-2	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.	2.C3.2.1	Apply GLP guidelines for safe handling and disposal of pharmaceuticals .
4-1-2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team	4.C1.4.1	Retrieve and evaluate information from different sources

4. Teaching and Learning Methods

1. Lectures (data show, board)
2. Practical sessions
3. Problem solving (Practical)
4. Self- Learning (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/Assignments/Projects/ ...)	Other (to be determined)
1	Lecture Transdermal drug delivery: - structure and function of the skin, - mechanism of drug transport through the skin	2	2	-	-	-
	Practical session - Lab regulations	2	-	1	-	-
2	Lecture -Factors affecting percutaneous absorption (biological and physicochemical factors)	2	2	-	-	-
	Practical session Preparation of sulfur ointment	2	-	1	-	-
3	Lecture - methods of maximizing the bioavailability of drugs applied to the skin -Penetration enhancers	2	2	-	-	-
	Practical session Preparation of white field ointment	2	-	1	-	-
4	Lecture Transdermal therapeutic patches(TTS) -Advantages and disadvantages - Types and examples Formative assessment (quiz1)	2	2	-	-	-
	Practical session Preparation of cold cream	2	-	1	-	-
5	Lecture Dermatological semisolid dosage forms - Ideal Properties of Semisolid Dosage Forms Types Of Conventional Semisolid Dosage Forms	2	2	-	-	-

	Practical session Preparation of vanishing cream	2	-	1	-	-
6	Lecture Ointments -Advantages and disadvantages -Types of ointment bases.	2	2	-	-	-
	Practical session Preparation of Shaving cream	2	-	1	-	-
7	Lecture Ointments -Characters of ideal bases -Methods Of Ointment Preparation -Stability and storage	2	2	-	-	-
	Practical session Preparation of Acne cream	2	-	1	-	-
8	Midterm exam					
9	Lecture Creams -Advantages and disadvantages -Different Types.	2	2	-	-	-
	Practical session Preparation of sunscreen cream	2	-	1	-	-
10	Lecture Creams - Emulsifying agents -Methods of preparation -Stability and storage Formative assessment (quiz 2)	2	2	-	-	-
	Practical session Preparation of Unna's paste	2	-	1	-*	-
11	Lecture Gels -Advantages and disadvantages -Types e.g. hydrogel, organogel. -Methods of Preparation, applications	2	2	-	-	-
	Practical Exam	2	-	1	-	-
12	Lecture Pastes -Different Types -Methods of preparation, examples	2	2	-	-	-

	Practical exam	2	-	1	-	-
13	Lecture Miscellaneous topical preparations e.g. Poultices, Plasters. Quality control tests for semisolids	2	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
14	Lecture General discussion and revision	2	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	-*	-
15	Final written exam					

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Mid-term Exam)	Week 8	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical /Clinical/... Exam	Weeks 11 and 12	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Weeks 13,14	5	5%
7	Assignment (Formative assessment)	Weeks 4,10	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books,	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of "Pharmaceutics II" approved by Pharmaceutics department 2025-2026.
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scientific references, etc.) *	Other References	<ul style="list-style-type: none"> - Transdermal Drug Delivery: Concepts and Application Author: Kevin Ita Publisher: Academic Press (2020) - Current Technologies to Increase the Transdermal Delivery of Drugs Editor: José Juan Escobar-Chávez et al. Publisher: Bentham Science Publishers, 2010 - Handbook of Pharmaceutical Manufacturing Formulations: Semisolid Products (3rd Ed.) Editor: Sarfaraz K. Niazi Publisher: CRC Press, 2022 - Semisolid Dosage (Special Issue Book) Publisher: MDPI Books, 2021 - Transdermal Drug Delivery Systems: Revised and Expanded Editor: Richard H. Guy Publisher: CRC Press - Handbook of Pharmaceutical Manufacturing Formulations: Semisolid Products Editor: Sarfaraz K. Niazi Publisher: CRC Press - 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, 12th edition, Howard C. Ansel and Mitchell J. Stoklosa.(2005)
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com and www.sciencedirect.com
	Learning Platforms (Links must be added)	https://shorturl.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board
	Supplies	Chemicals, Glassware, digital balance and water bathes
	Electronic Programs	3. Microsoft office 4. Microsoft teams
	Skill Labs/ Simulators	-

	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature

Course Coordinator

Prof. Dr. Azza Ali Hasan

Name and Signature

Head of Department

Prof.Dr.Shreen sabry

**COURSE
SPECIFICATIONS**

Pharmacology I

Second level – Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacology I			
Course Code (according to the bylaw)	PO 401			
Department/s participating in delivery of the course	Pharmacology & Toxicology department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 2 hrs/week	Practical 1 hrs/week	Other (specify) -	Total 3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 2- semester 4			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Rasha Hassan Abdel-Ghany			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

Upon completing the course, students will understand and apply core principles of pharmacokinetics and pharmacodynamics, identify and interpret adverse drug reactions, and integrate these concepts into rational pharmacotherapy. They will gain in-depth knowledge of drugs affecting the autonomic nervous system—such as cholinergic, anticholinergic agents, adrenergic agonists and antagonists—as well as medications used in glaucoma treatment. The course also covers skeletal muscle relaxants, local anesthetics, and the physiology of urine formation as a foundation for understanding diuretics and antidiuretics. Additionally, students will learn cardiac electrophysiology and how drugs modulate the renin-angiotensin system, plasma kinins, and related pathways, enabling them to assess the clinical use of antihypertensives and cardiac glycosides.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.3.1.	Define the basic principles of general and introductory pharmacology, including routes of drug administration, and explain the fundamentals of pharmacokinetics and pharmacodynamics in relation to both normal and pathophysiological conditions.
		1.C1.3.2.	Identify and classify drugs acting on the autonomic nervous system
		1.C1.3.3.	Identify and classify drugs used for cardiovascular diseases.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.10.1.	Explain pharmacological properties of Autonomic nervous system acting drugs including mechanism of drug action, adverse reactions, contraindications, and drug-drug interactions.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
		1.C1.10.2.	Explain pharmacological properties of drugs used for cardiovascular diseases including mechanism of drug action, adverse reactions, contraindications, and drug-drug interactions.
		1.C1.11.1.	Integrate core pharmacological knowledge to address drug-related needs and contribute to the achievement of safe, effective, and individualized patient care outcomes.
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and bio-pharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.	2.C2.7.1.	Utilize computer-aided tools through the organ bath simulation program to investigate the dose-response effects of Acetylcholine and Atropine on isolated rabbit intestinal muscle contraction and determine the site of action of various autonomic drugs.
		2.C2.7.2.	Utilize computer-aided tools through the virtual rat simulation program to examine the cardiovascular effects—such as heart rate and blood pressure changes—induced by autonomic drugs.
4.1.2	Retrieve and critically analyze information, identify, and solve problems, and work autonomously and effectively in a team.	4.C1.4.1.	Collaborate with peers to analyze, and evaluate pharmacological information in order to formulate evidence-based recommendations for patient management.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.2.1.	Apply appropriate information technology tools and effectively communicate pharmacological concepts through structured oral or visual presentations

4. Teaching and Learning Methods

- 1. Lectures (data show, board)**
- 2. Practical labs**
- 3. Simulation-based education (Practical)**
- 4. Problem -based learning (Practical)**
- 5. Self- learning (Activity)**
- 6. Blended- learning (Activity)**

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/Assignments/Projects/ ...)	Other (to be determined)
1	Lecture -General and introductory pharmacology Routes of administration	2	2	-	-	-
	Practical session - Introduction • Types of pharmacological experiments • Overview of Pharmacological Simulation Software	2	-	1	-	-
2	Lecture Pharmacokinetics	2	2	-	-	-
	Practical session Demonstration videos of in-vitro pharmacological experiments using a kymograph.	2	-	1	-	-
3	Lecture Pharmacodynamics	2	2	-	-	-
	Practical session Illustration: Studying the Dose-Response Effects of Acetylcholine on Isolated Rabbit Intestinal Muscle Contraction Using the Organ Bath Simulation Program, Performing Calculations, and Constructing the Concentration-Effect Curve to Determine EC50.	2	-	1	-	-
4	Lecture - Dose-response relationship Combined effects of drugs Adverse drug reactions Formative assessment (quiz1)	2	2	-	-	-
	Practical session Student Application: Studying the Dose-Response Effects of Acetylcholine on Isolated Rabbit Intestinal Muscle Contraction Using the Organ Bath Simulation Program, Performing	2	-	1	-	-

	Calculations, and Constructing the Concentration-Effect Curve to Determine EC50.					
5	Lecture - Autonomic Nervous System acting Drugs - Parasympathomimetics	2	2	-	-	-
	Practical session Illustration: Studying the Dose-Response Effects of Atropine on Acetylcholine-Induced Contraction of Isolated Rabbit Intestinal Muscle Using the Organ Bath Simulation Program, Performing Calculations, and Constructing the Concentration-Effect Curve to Determine EC50.	2	-	1	-	-
6	Lecture -Parasympatholytic drugs -Drugs acting on autonomic ganglia -Skeletal muscle relaxants	2	2	-	-	-
	Practical session Student Application: Studying the Dose-Response Effects of Atropine on Acetylcholine-Induced Contraction of Isolated Rabbit Intestinal Muscle Using the Organ Bath Simulation Program, Performing Calculations, and Constructing the Concentration-Effect Curve to Determine EC50.	2	-	1	-	-
7	Lecture -Sympathomimetics	2	2	-	-	-
	Practical session Illustration: Demonstrating the Effects and Sites of Action of Different Stimulant and Relaxant Drugs on Isolated Rabbit Intestinal Muscle Using the Organ Bath Simulation Program.	2	-	1	-	-
8	Midterm exam					
9	Lecture -Sympatholytics -Adrenergic neuron blockers	2	2	-	-	-
	Practical session Student Application and Problem Solving: Investigating the Effects and	2	-	1	-	-

	Sites of Action of Various Stimulant and Relaxant Drugs on Isolated Rabbit Intestinal Muscle Using the Organ Bath Simulation Program, Analyzing Responses, and Solving Related Pharmacological Scenarios.					
10	Lecture - Antihypertensive agents Formative assessment (quiz 2)	2	2	-	-	-
	Practical session - Illustration: Demonstrating the Cardiovascular Effects of Autonomic Drugs Using the Virtual Rat Simulation Program (Heart Rate and Blood Pressure Monitoring).	2	-	1	-*	-
11	Lecture - Diuretics	2	2	-	-	-
	Practical session -Student Application and Problem Solving: Analyzing Artificially Generated Charts Depicting Heart Rate and Blood Pressure Responses to Autonomic Drugs. - Orientation on activity	2	-	1	-	-
12	Lecture Antiarrhythmic drugs Formative assessment (quiz 3)	2	2	-	-	-
	Practical sessions Revision	2	-	1	-	-
13	Lecture - Drugs for congestive heart failure	2	2	-	-	-
	Practical session Practical exam	2	-	1	-*	-
14	Lecture Drugs for treatment of angina	2	2	-	-	-
	Practical session Activity presentation	2	-	1	-*	-
15	Final written exam					

* As part of a self-learning activity in pharmacology I course, a part of practical session in week 11 was specified for the explanation of activity guidelines, rules and assessment rubric.-Also, practical session in week 14 was facilitated for students to present their reports on the various activity self-learning topics according to the announced student distribution on topics. Supervisors

engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Mid-term Exam)	Week 8	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical /Clinical/... Exam	Weeks 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Weeks 11	5	5%
7	Assignment (Formative assessment)	Weeks 4,10,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of “Pharmacology I” approved by the Pharmacology& Toxicology department 2025-2026.
	Other References	<ol style="list-style-type: none"> Richard A. Harvey, Michelle A. Clark, Lippincott's Illustrated Reviews Pharmacology 9th ed. Lippincott Williams & Wilkins, 2025. Katzung, B.G., ed. Basic and Clinical Pharmacology. 16th ed. New York: McGraw Hill, 2023. Hardman J.G., L.E. Limbird, and A.G. Gilman, eds. Goodman & Gilman's the Pharmacological Basis of Therapeutics. 14th ed. New York : McGraw Hill, 2022. H.P.Rang,M.M.Dale,J.M.Ritter& R.J.

		<p>Flower ed. RANG & DALE Pharmacology 9th 2020 Churchill 2. Livingstone Elsevier London.</p> <p>5. Bennet P.N., and M.J. Brown, eds. Clinical Pharmacology. 12th ed. London :Churchil Livingstone, 2019.</p> <p>6. Luellmann H., L. Hein, K. Mohr, and D. Bieger. Color Atlas of Pharmacology. 5th ed. Stuttgart :Thieme, 2017.</p>
	<p>Electronic Sources (Links must be added)</p>	<ul style="list-style-type: none"> • British J Pharmacol, (www.brjpharmacol.org) • European J Pharmacol, (www.elsevier.com/journals/european-journal-of-pharmacology/0014-2999#description) • Pubmed.com • www.medconsult.com • www.pharmanet.com
	<p>Learning Platforms (Links must be added)</p> <p><u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u></p>	<p>https://shorturl.at/sar8D</p>
	Other (to be mentioned)	-
<p>Supportive facilities & equipment for teaching and learning *</p>	Devices/Instruments	Computer, board
	Supplies	-----
	Electronic Programs	5. Microsoft office 6. Microsoft teams
	Skill Labs/ Simulators	ObSim
	Virtual Labs	RatCVS
	Other (to be mentioned)	-

Name and Signature

Course Coordinator

Prof. Dr. Rasha Hassan Abdel-Ghany

Name and Signature
Head of Department

Prof. Dr. Islam Ahmed

**COURSE
SPECIFICATIONS**

**Scientific Writing and
Communication skills**

Second level – Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Scientific Writing and Communication skills			
Course Code (according to the bylaw)	NP 403			
Department/s participating in delivery of the course	Pharmacy Practice department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 hrs/week	1 hrs/week	-	2 hrs/week
Course Type	Faculty Requirements (Compulsory)			
Academic level at which the course is taught	Level 2- semester 4			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Heba El-Sayed			
Course Specification Approval Date	25/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Council of Quality Assurance unit			

2. Course Overview (Brief summary of scientific content)

This course helps students develop skills in scientific writing, and professional communication in pharmacy practice. It aims to develop their ability to structure scientific papers and improve inter- and intra-professional collaboration and communication with patients and other health care providers.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.4.1	Describe the scientific writing process and its key stages
		1.C1.4.2	Explain appropriate keys for good communication with patients
		1.C1.4.3	Identify different barriers that hinder effective patient – pharmacist communication
2.1.2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity.	2.C1.4.1	Evaluate pharmacist behavior in different communication scenarios
2.5.3	Contribute in planning and conducting research studies using appropriate methodologies	2.C5.5.1	Organize and compose a scientific paper in accordance with the IMRAD (Introduction, Methods, Results and Discussion) model
		2.C5.5.2	Analyze and review scientific papers in terms of key message, consistency and justification
		2.C5.5.3	Reflect on the ethics in scientific writing
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills	4.C1.1.1	Work effectively as a member of a team

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
4.2.1	Demonstrate effective communication skills verbally, non-verbally, and in writing with professional health care team, patients, and communities.	4.C2.1.1	Interact effectively with patients, the public and health care professional orally and written
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.2.1	Use information technology to collect and present data

4. Teaching and Learning Methods

- Lectures
- Role play (Practical sessions): Students practice communication skills by acting out scripted scenarios of pharmacist–patient interactions that help them identify communication challenges and apply effective strategies to overcome them.
- Case study (Practical sessions)
- Blended learning (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignments/Projects/...)	Other (to be determined)
1	Lecture - The Canonical Structure of the Scientific Paper	1	1	-	-	-
	Practical session - Finding relevant journals and selecting the right one	2	-	1	-	-
2	Lecture Front Matter and Abstract	1	1	-	-	-
	Practical session Building title & abstract	2	-	1	-	-

3	Lecture The Introduction Section	1	1	-	-	-
	Practical session Building introduction section	2	-	1	-	-
4	Lecture - The Methods Section	1	1	-	-	-
	Practical session Building methods section	2	-	1	-	-
5	Lecture - The Results Section	1	1	-	-	-
	Formative assessment (quiz1)					
6	Practical session Building results section	2	-	1	-	-
	Lecture The Discussion Section Conclusion Plagiarism Ethical guidelines for using AI Citations	1	1	-	-	-
7	Practical session Building discussion Section Conclusion Citations	2	-	1	-	-
	Midterm exam					
8	Lecture Patient-Centered Communication in Pharmacy Practice	1	1	-	-	-
	Practical session Communication Skills: Course orientation	2	-	1	-	-
9	Lecture Principles and Elements of Interpersonal Communication	1	1	-	-	-
	Practical session Case study & role play	2	-	1	-	-
10	Lecture - Nonverbal Communication	1	1	-	-	-
	Practical session - Case study & role play Activity orientation	2	-	1	-*	-
11	Lecture - Barriers to Communication Communication Skills and	1	1	-	-	-

	Interprofessional Collaboration					
	Practical session Case study & role play	2	-	1	-*	-
12	Lecture Strategies to Meet Specific Needs Patient counselling	1	1	-	-	-
	Practical session Activity evaluation	2	-	1	-*	-
13	Lecture - Electronic Communication in Health Care Ethical Behavior when Communicating with Patients Formative assessment (quiz 2)	1	1	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture Revision	1	1	-	-	-
	Practical session Revision	2	-	1	-	-
15	Final written exam					

* As part of this course, a self-learning activity is introduced. In week 10, students are briefed on activity guidelines, rules, and assessment rubric. In weeks 11&12 the various activity topics were assessed objectively.

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Mid-term Exam	Week 7	5	5%
3	Final Written Exam	Week 15	60	60%
4	Practical Exam	Week 13	25	25%
5	Final Oral Exam	-	-	-
6	Activity	Weeks 12	10	10%

7	Formative assessment	Weeks 5,13	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	<ol style="list-style-type: none"> 1. Student book of Scientific Writing and Communication skills approved by pharmacy practice department, 2021. 2. Robert S. Beardsley, Carole L. Kimberlin, William N. Tindall. (2008), Communication Skills in Pharmacy Practice: A Practical Guide for Students and Practitioners, 5th edition, Lippincott Williams & Wilkins. 3. Stephen B. Heard (2016), The Scientist's Guide to Writing, Princeton University Press. 4. Beardsley, R. S., Skrabal, M. Z., & Kimberlin, C. L. (2019). Communication Skills in Pharmacy Practice: A Practical Guide for Students and Practitioners, 7th edition, Wolters Kluwer.
	Other References	<ol style="list-style-type: none"> 7. Hasan, S. (2008), A Tool to Teach Communication Skills to Pharmacy Students. <i>American journal of pharmaceutical education</i>, 72(3), 76 8. Lemay, J., Waheedi, M., Al-Sharqawi, S., & Bayoud, T. (2018). Pharmacist–patient communication: A review of the literature. <i>Research in Social and Administrative Pharmacy</i>, 14(5), 491–504.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ http://chemwiki.ucdavis.edu/ www.Pubmed.Com and www.sciencedirect.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Black (white) boards, data show, air conditioned classroom
	Supplies	None.
	Electronic Programs	Microsoft office
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator

Prof. Heba El-Sayed

Name and Signature
Head of Department

Ass. Prof. Esraa Zakria

**COURSE
SPECIFICATIONS**

**Pharmaceutical
Legislations and
Professional ethics**

Second level – Semester 4

2025-2026

Course Specification

(2025)

1. Basic Information

Course Title (according to the bylaw)	Pharmacy Legislation and professional ethics			
Course Code (according to the bylaw)	NP 404			
Department/s participating in delivery of the course	Pharmaceutics department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 hr/week	--		1 hr/week
Course Type	Non professional			
Academic level at which the course is taught	second level/ fourth semester			
Academic Program	Bachelor of pharmacy (Pharm D)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig University			
Name of Course Coordinator	Prof. Hanaa Elghamry			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, students will be able to describe the basics of pharmacy legislation including laws governing establishment of pharmacy profession, legislation principles for non controlled and controlled prescriptions, over the counter drug requirements, opening new pharmacies, opening medical stores, opening factories, opening scientific offices, medicine stores management. Pharmacist duties and responsibilities, pharmacist-patient relationship, pharmacists relationship with society and family patient's rights ,ethical principles and moral values , research ethics and animal ethics.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1-1-1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences	1.C1.5.1	Outline different principles of pharmacy legislation including laws governing establishment of private pharmacies and drug stores, factories and scientific offices
2-1-2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity	2.C1.1.1	Carry out duties as a pharmacist in a professional manner that complies with the ethical guidelines governing the profession.
		2.C1.2.1	Maintain appropriate inter-professional relationships and ethical principles
		2.C1.3.1	Describe legal principles for non

			narcotics and narcotics prescription
		2.C1.5.1	State patient rights in different cases involving misconduct of pharmacy practice laws
2-5-3	Contribute in planning and conducting research studies using appropriate methodologies	2.C5.1.1	Understand requirement of regulatory framework to authorize medicinal product and pharmaceutical research studies

4.

Teaching and Learning Methods

1. Lectures
2. Self learning (Activity)
3. Flipped classroom

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/Assignments/Projects/ ...)	Other (to be determined)
1	قانون مزاولة مهنة الصيدلة	1	1	-	-	-
2	المؤسسات الصيدلية الصيدليات العامة	1	1	-	-	-
3	المؤسسات الصيدلية الصيدليات الخاصة مخازن الأدوية المصانع formative assessment quiz1	1	1	-	-	-
4	المؤسسات الصيدلية مجال الاتجار في النباتات الطبية	1	1	-	-	-
5	المستحضرات الصيدلية الخاصة و الدستورية	1	1	-	-	-
6	مسؤوليات وواجبات الصيدلي تجاه المريض وطرق السلامة التي يتبعها الصيدلي مع المريض	1	1	-	-	-
7	أخلاقيات مزاولة المهنة	1	1	-	-	-
8	Mid term exam					
9	القواعد العامة التي تحكم اخلاقيات المهن الطبية	1	1	-	-	-
10	علاقة الصيدلي بالمجتمع formative assessment quiz2	1	1	-	-	-
11	قانون مكافحة المخدرات وتنظيم استعمالها و الاتجار فيها Activity	1	1	-	-	-
12	جدول قانون مكافحة المخدرات أخلاقيات البحث العلمي و التعامل مع الحيوانات و ادارة الازمات في المجتمع	1	1	-	-	-
13	Revision	1	1	-	-	-
14	open discussion	1	1	-	-	-
15	Final exam					

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (mid term exam)	Week 8	15	15%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	75	75%
	Final Practical/Clinical/... Exam	-	-	-
	Final Oral Exam	-	-	-
	Project (self learning activity) /Portfolio/ Logbook	Week 11	10	10%
	Assignments (formative assessments)	Week 3, week 10	-	-
	Other (Mention)		--	-

* The methods mentioned are examples, the organization may add and/or delete

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book of Pharmacy legislation and professional ethics approved by pharmaceutics department 2025-2026
	Other References	<p>Pharmacy practice and the law, Third Edn., Jones and Bartlett publishers, Inc., Boston, USA, 2004.</p> <p>• Remingtons, The science and practice of pharmacy, 20 th Edn., published by Philadelphia college of pharmacy and science, Philadelphia, USA, 2000.</p> <p>Modern pharmaceutics, Third Edn., G.S. Banker and Ch.T. Rhodes, Marcel Dekker, Inc., New York, USA, 1996</p> <p>• Textbook of Non-prescription drugs. American Pharmaceutical Association</p>

	Electronic Sources (Links must be added)	https://1999.tel/ https://www.mohp.gov.eg/ متابعة موقع النقابة العامة للصيادلة وكذلك موقع وزارة الصحة على الانترنت https://www.ekb.eg/
	Learning Platforms (Links must be added)	Electronic platform of Faculty of Pharmacy-Zagazig University for students https://shorturl.at/sar8D
	Other (to be mentioned)	
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Black (white) boards, overhead projectors, data show, computers
	Supplies	
	Electronic Programs	Microsoft office Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

* The list mentioned is an example, the institution may add and/or delete depending on the nature of the course

Name and Signature
Course Coordinator
Prof. Hanaa Elghamry

Program Coordinator
Prof.Dr.Hanan El-Nahas

COURSE SPECIFICATION

Raw Materials

Second level – Semester 4

2025-2026

Course Specification

(2025 - 2026)

1. Basic Information

Course Title (according to the bylaw)	Raw Materials			
Course Code (according to the bylaw)	PR 404			
Department/s participating in delivery of the course	Pharmaceutical Organic Chemistry			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 hr/week	1 hr/week	-	2 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 2 - semester 4			
Academic Program	Bachelor of Pharmacy (Pharm D)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig University			
Name of Course Coordinator	Prof. Dr. / Amany Mohamed El-mahmoudy			
Course Specification Approval Date	18 / 8 / 2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

Upon completing the course, students will be able to underline the chemistry of amino acids, peptide, protein, peptidomimetics, nucleic acids, polymers and polynuclear aromatic hydrocarbons. The course also covers different synthetic pathways, classification, and chemical interactions of the above-mentioned medicinally important scaffolds. Additionally, students will learn how to identify chemical names and apply theoretical modifications on different molecules of pharmaceutical interest including commercially available drugs.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.2.1	Illustrate the principles of amino acids, peptide, protein, peptidomimetics, nucleic acids, polymers and polynuclear aromatic hydrocarbons chemistry.
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	Select the proper method for synthesis of different pharmaceutically important compounds including commercially available drugs.
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.C2.5.1	Select appropriate methods for synthesis and analysis of different pharmaceutically active nuclei.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.2.1	Demonstrate good information technology by research on proteins and other polynuclear compounds.
		4.C2.2.2	Implement writing skills through lab sessions.

4. Teaching and Learning Methods

- 1- Lectures (data show, board)
2. Practical sessions
3. Self-learning (Activity)
4. Blended- learning (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/Assignments / Projects/ ...)	Other (to be determined)
1	Lecture - Classification of Polynuclear Hydrocarbons.	1	1	-	-	-
	Practical session -Polynuclear Aromatic Hydrocarbons containing drugs: 1- Naproxen	1	-	1	-	-
2	Lecture Linear and angular fused benzenoid polynuclear aromatic hydrocarbons.	1	1	-	-	-
	Practical session -Polynuclear Aromatic Hydrocarbons containing drugs: 2- Anthraquinone glycosides	1	-	1	-	-
3	Lecture - Nucleosides, Nucleotides	1	1	-	-	-
	Practical session - The search for antiviral drugs: 1- Acyclovir	1	-	1	-	-
4	Lecture - Nucleic Acids Formative assessment (quiz 1)	1	1	-	-	-

	Practical session - The search for antiviral drugs: 2- Zidovudine	1	-	1	-	-
5	Lecture - The Architecture of Polymers	1	1	-	-	-
	Practical session - Polymers containing drugs: 1- Polystyrene sulfonate 2- Sevelamer	1	-	1	-	-
6	Lecture -Step-growth polymerization	1	1	-	-	-
	Practical session -Amino acids containing drugs: 1-Melflufen	1	-	1	-	-
7	- Periodical exam					
8	Lecture - Chain-Growth Polymerizations	1	1	-	-	-
	Practical session -Amino acids containing drugs: 2- Ibuprofen	1	-	1	-	-
9	Lecture - Synthetic polymers.	1	1	-	-	-
	Practical session -Amino acids containing drugs: 3- L-Arginine L-aspartate	1	-	1	-	-
10	Lecture - AMINO ACIDS: Classification and Nomenclature Formative assessment (quiz 2)	1	1	-	-	-
	Practical session -Amino acids containing drugs: 4- Captopril	1	-	1	-	-
11	Lecture - Peptide structure determination	1	1	-	-	-

	Practical session - Amino acids containing drugs: 5-Enfuvirtide	1	-	1	-	-
12	Lecture - Peptide Synthesis - Peptidomimetics	1	1	-	-	-
	Practical session - Orientation on Activity	1	-	1	-*	-
13	Lecture - Research and production of new active entities of drugs. -Raw material for organic pharmaceutical industries.	1	1	-	-	-
	Practical exam	1	-	1	-	-
14	Lecture General discussion and revision	1	1			
	Practical session Discussion and Assessment of activity	1	-	1	-*	-
15	Final written exam					

* As part of a self-learning activity in Raw Materials course, a part of practical session in week 12 was specified for the explanation of activity guidelines, rules and assessment rubric. Also, practical sessions in week 14 were facilitated for students to present their reports on the various activity self-learning topics according to the announced student distribution on topics. Supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

5. Methods of students' assessment

No	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical/Clinical/... Exam	Week 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Weeks 12, 14	5	5%
7	Assignment (Formative assessment)	Weeks 4, 10	-	-
8	Other (Mention)	-	-	-

6. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.)	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of "Raw Materials" approved by the pharmaceutical organic chemistry department (2025-2026).
	Other References	I- Solomons, T.W.G., Fryhle, C.B., and Snyder, S.A. <i>Organic Chemistry</i> . 10th ed. Hoboken, NJ: Wiley, 2023. II- Vollhardt, K.P.C., and Schore, N.E. <i>Organic Chemistry: Structure and Function</i> . 8th ed. New York: W.H. Freeman, 2022. III- Narain, R.P. <i>Principles of Organic Chemistry: A Compendium of Fundamentals</i> . 2nd ed. Cham: Springer, 2021. IV- McMurry, J.E., and Begley, T.P. <i>Organic Chemistry of Biological Pathways</i> . 2nd ed. New York: W.H. Freeman, 2021.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ http://chemwiki.ucdavis.edu/ www.Pubmed.Com and www.sciencedirect.com

	Learning Platforms (Links must be added)	https://shorturl.at/sar8D
	Other (to be mentioned)	
Supportive facilities & equipment for teaching and learning	Devices/Instruments	Computer, board, data show
	Supplies	Chemicals, Glassware, Fume hood
	Electronic Programs	1. Microsoft office 2. Microsoft team
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature

Course Coordinator

Prof. Dr. Amany Mohamed El-mahmoudy

Name and Signature

Head of the department

Prof. Dr. Amany Mohamed El-mahmoudy

**COURSE
SPECIFICATION**

Pathology

Second level – Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pathology			
Course Code (according to the bylaw)	MD 405			
Department/s participating in delivery of the course	Microbiology and Immunology			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 1 hr/week	Practical 1 hr/week	Other (specify) -	Total 2 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	level 2 / Semester 4			
Academic Program	Bachelor of Pharmacy-Pharm D			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Ashraf kadry			
Course Specification Approval Date	18/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, the students will be able to identify the fundamentals of pathology. Also, they can perform examination and demonstration of computer slides of different diseases from different specimens (morphological and microscopical). In addition, they will understand the etiology of disease, the mechanisms of pathogenesis and the associated alterations in structure and function to be able to determine the most likely diagnosis of the disease and develop critical thinking skills and communication skills.

3. Course Learning Outcomes CLOs

Matrix of course learning outcomes CLOs with program outcomes POs (NARS/ARS)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
1.1.1	Demonstrate understanding of knowledge of pharmaceutical, biomedical, social, behavioral, administrative, and clinical sciences.	1.C1.3.1	Identify the fundamentals of pathology
		1.C1.3.2	Recognize the response of body cells to various injurious agents
		1.C1.3.3	Outline the etiology of disease and the clinical response to disease process
		1.C1.8.1	Use proper pharmaceutical and medical terms and abbreviations and symbols in pharmacy practice.
3.1.1	Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.	3.C1.1.1	Perform examination and demonstration of computer slides of different diseases from different specimens

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
3.1.3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases	3.C1.4.1	Analyze and interpret experimental results for identification of different pathological diseases.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Acquire online search skills through writing reports and presenting them

4. Teaching and Learning Methods

- 1.** Lectures
- 2.** Practical sessions
- 3.** Self- Learning (Activity)*

* The activity consists of individual written reports submitted by students, which are then discussed during the practical sessions and evaluated.

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/	Training (Practical/ Clinical/)	Self-learning (Tasks/ Assignments / Projects/ ...)	Other (to be determined)
1	➤ Lecture: -Introduction - Inflammation Fate of inflammation - Repair and regeneration .	2	2	-	-	-
	➤ Practical session: Types of acute inflammation	2	-	1	-	-
2	➤ Lecture: - Acute inflammation types Chronic inflammation types	2	2	-	-	-
	➤ Practical session: Types of chronic inflammation	2	-	1	-	-
3	➤ Lecture: Cell injury and adaptations Degeneration and necrosis .	2	2	-	-	-
	➤ Practical session: Cell healing Cell death → necrosis	2	-	1	-	-
4	➤ Lecture: - Disorders of growth • Reduced growth (Atrophy) ➤ Non-Neoplastic growth ➤ Formative assessment (quiz 1)	2	2	-	-	-
	➤ Practical session ➤ Reduced growth (Atrophy) Non-Neoplastic growth	2	-	1	-	-

	➤ Lecture - Disorders of growth Neoplastic growth (benign and malignant tumors)	2	2	-	-	-
5	➤ Practical session Neoplastic growth (benign and malignant tumors)	2	-	1	-	-
6	➤ Lecture Metabolic disorders <ul style="list-style-type: none"> • Diabetes mellitus • Pigmentation disorders 	2	2	-	-	-
	➤ Practical session Pigmentation disorder	2	-	1	-	-
7	➤ Lecture: Circulatory disorders <ul style="list-style-type: none"> • Hypertension • Edema • Hyperemia • Heart failure 	2	2	-	-	-
	➤ Practical session: Circulatory disorders	2	-	1	-	-
8	Periodical Exam					
9	➤ Lecture: Circulatory disorders ➤ Thrombosis and embolism ➤ Ischemia and infarction Atherosclerosis ➤ Hemorrhage	2	2	-	-	-
	➤ Practical session: Hepatic disorders	2	-	1	-	-
10	➤ Lecture: Pulmonary disorders <ul style="list-style-type: none"> • Cystic fibrosis • Chronic obstructive pulmonary diseases (COPD) • Pleural effusion 	2	2	-	-	-

	<ul style="list-style-type: none"> • Pneumonia and empyema. <p>➤ Formative assessment (quiz 2)</p>					
	<p>➤ Practical session: Pulmonary disorders</p>	2	-	1	-*	-
11	<p>➤ Lecture: - Renal disorders</p> <ul style="list-style-type: none"> • Urinary tract infections • Renal stones • Nephritis 	2	2	-	-	-
	<p>Practical - Renal disorders</p>	2	-	1	-	-
12	<p>➤ Lecture: ➤ Nephrotic syndromes ➤ Formative assessment (quiz 3)</p>	2	2	-	-	-
	<p>➤ Practical exam</p>	2	-	1	-	-
13	<p>➤ Lecture: - Hepatic disorders</p> <p>➤ Hepatic Fibrosis ➤ Hepatic Cirrhosis ➤ Ascites</p>	2	2	-	-	-
	<p>➤ Practical session: Discussion and Assessment of activity</p>	2	-	1	-*	-
14	<p>Lecture General discussion and revision</p>	2	2	-	-	-
	<p>➤ Practical session: Discussion and Assessment of activity</p>	2	-	1	-*	-
15	Final written exam					

* Within pathology course, week 10 is dedicated to outlining the self-learning activity guidelines and assessment rubric. In week 13 and 14, students present their reports on assigned topics, followed by discussions with supervisors to evaluate acquired skills, findings, and conclusions. The activity is assessed using clear and consistent evaluation criteria.

6. Methods of students' assessment

No .	Assessment Methods	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (<u>Periodical Exam</u>)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final <u>Practical/Clinical/...</u> Exam	Weeks 12	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (<u>Self-learning Activity</u>)	Weeks 10,13,14	5	5%
7	Assignment (<u>Formative assessment</u>)	Weeks 4,10,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.)	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	<ul style="list-style-type: none"> ● Student book of "Notes in pathology" approved by Microbiology & Immunology department (2025-2026) ● Practical book of pathology " approved by Microbiology & Immunology department (2025-2026)
	Other References	1- Pathological basis of the diseases (Generak and special pathology), 3rd edition ,Mangoud A.and Eissa M.(eds) .New Art Print ,Egypt 2008 2- Robbin,s pathological basis of diseases ,7th edition .Robbins and Cotran (eds).Lippincot Ravin,Philadelphia.2007. 3- Ackerman,s Surgical Pathology ,9th edition ,Rosai J.(ed) .Mosby, London .2004
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com www.sciencedirect.com https://www.wiley.com/ https://www.springernature.com/gp
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagazig University for students</u>	https://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin
	Other (to be mentioned)	-

Supportive facilities & equipment for teaching and learning	Devices/Instruments	<ul style="list-style-type: none"> • For lectures: whiteboard, data show and computer. • For Labs: Autoclaves, Incubators, Ovens, fermenters, microscopes, refrigerators.
	Supplies	Chemicals, plates and microbiological culture media.
	Electronic Programs	<ol style="list-style-type: none"> 1. Microsoft office 2. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator
Prof. Dr. Ashraf kadry

Name and Signature
Head of Department
Ass.Prof. Dr. Momen Ezz-Elarab