



وحدة ضمان الجودة



Courses Specifications Faculty of Pharmacy

Bachelor of pharmacy (Pharm D – Clinical Pharmacy) Program

Second level

2025-2026



وحدة ضمان الجودة



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وحدة ضمان الجودة



كلية الصيدلة
FACULTY OF PHARMACY

Semester 3

COURSE SPECIFICATION

Bachelor of Pharmacy

**(Pharm D - Clinical
Pharmacy)**

Pharmaceutical Organic III

PR303

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)	PR303			
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
	2 hrs/week	1hr/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) (clinical pharmacy)			
Faculty/Institute	faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Asst. Prof. Nermine A. Osman			
Course Specification Approval Date	8/18/2025			

Course Specification Approval (Attach the decision/minutes of the department /committee/council)	department council
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2. Course Overview (Brief summary of scientific content)

... On completion of the course, the student will be able to: Acquire the fundamental bases of the chemistry of carbohydrates, their identification, and applications in pharmaceutical compounds. Understand the chemistry of aromatic heterocyclic compounds as well as their importance in synthesis of drugs (in pharmaceutical industry), Develop skills in terms of identification and synthesis of organic compounds including some drugs. Understand 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 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	Outline the chemistry of carbohydrates and categorize important chemical reactions.
1.1.3	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare,	1.C1.9.1	Illustrate the principles of UV, IR, NMR and Mass spectroscopy.

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
	analyze, and assure quality of synthetic/ natural pharmaceutical materials/products.		
2-2-1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/ natural pharmaceutical materials.	2. C2.1.1	Synthesize different pharmaceutically active nuclei including 1,2,3-benzotriazole , and 3-Methyl-2[1H]quinoxalinone
		2.C2.1.2	Perform identification tests for carbohydrates. Synthesis of Fructosazone
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	Describe the principles of various instruments and analytical techniques used in spectroscopy, such as UV-Vis, IR, NMR, and mass spectrometry
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.C1.3.1	Prepare a laboratory report using a predefined timeline
4.3.2	Practice independent learning needed for continuous professional development.	4.C3.2.1	Independent problem-solving of reaction mechanisms, stereochemistry, and structure determination exercises.

4. Teaching and Learning Methods

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

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 Carbohydrates Introduction and Classification.	2	2	-	--	--
	Practical session general scheme for carbohydrates	2	-	1	--	--
2	Lecture Carbohydrates Disaccharides, Polysaccharides Drugs containing carbohydrates	2	2	-	--	--

	Practical session Identification of glucose and fructose	2	-	1	--	--
3	Lecture Heterocyclic chemistry (Nomenclature) Formative assessment (quiz1)	2	2	-	--	--
	Practical session Identification of lactose, starch and sucrose	2	-	1	--	--
4	Lecture Five-membered heterocyclic with one heteroatom, (synthesis and reactions)	2		-	--	--

			2			
	Practical session Synthesis of fructosazone	2	-	1	--	--
5	Lecture - Indole (benzo[b]pyrrole) - Five-membered rings containing two heteroatoms. (synthesis and reactions) Formative assessment (quiz2)	2	2	-	--	--
	Practical session Applications on nomenclature of heterocyclic compounds	2	-	1	--	--
6	Lecture Six-membered heterocyclic with one heteroatom: (synthesis and reactions)	2	2	-	--	--

	Practical session Applications on nomenclature of heterocyclic compounds	2	-	1	--	--
7	Midterm exam					
8	Lecture Six-membered rings containing two heteroatoms + purine nucleus and application (synthesis and reactions)	2	2	-	--	--
	Practical session Synthesis of 1,2,3-benzotriazole	2	-	1	--	--
9	Lecture spectroscopy -UV and visible spectroscopy	2	2	-	--	--
	Practical session Synthesis of 3-methyl-2[1H]quinoxalinone	2	-	1	--	--
10	Lecture	2	2	-	--	--

	Infrared spectroscopy (IR)					
	Practical session Applications on UV and visible spectroscopy - Orientation on Activity	2	-	1	--	--
11	Lecture Mass spectrometry Formative assessment (quiz 3)	2	2	-	--	--
	Practical session Applications on Infrared spectroscopy	2	-	1	--	--
12	Lecture ¹ H-NMR spectroscopy	2	2	-	--	--
	Practical session	2	-	1	--	--

	Applications on Mass spectrometry					
13	Lecture ¹³ C-NMR spectroscopy	2	2	-	--	--
	Practical exam	2	-	1	--	--
14	Lecture Applications on spectroscopy	2	2	-	--	--
	Practical session Discussion and Assessment of activity	2	-	1	-*	--
15	Final written exam					

* As part of a self-learning activity in pharmaceutical organic chemistry **III** course, a part of practical session in week 10 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.

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Semester work)	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)	Week 10,14	5	5%
	Assignments (Formative assessment)	Weeks 3,5,11	-	-
	Other (Mention)	--	--	--

6. Learning Resources and Supportive Facilities *

Learning resources	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 Pharmaceutical Organic Chemistry Department 2025-2026
		1- Raj K Bansal. " Heterocyclic Chemistry ,7th edition.2023.

(books, scientific references, etc.)*	Other References	2- T.Wgraham Solomons. "organic chemistry".13th edition.2023 3- Muralidhara Rao "instrumental method of analysis".2nd edition. 2019 4- timir tripathi. " introduction to spectroscopy".2023
	Electronic Sources (Links must be added)	www.sciencedirect.com www.Pubmed.Com https://www.ekb.eg/
	Learning Platforms (Links must be added)	https://shorturl.at/sar8D
	Other	--

	(to be mentioned)	
Supportive facilities & equipment for teaching and learning*	Devices/Instruments	data show & white board
	Supplies	chemicals & glassware
	Electronic Programs	Microsoft office Microsoft teams
	Skill Labs/ Simulators	--
	Virtual Labs	--
	Other (to be mentioned)	--

Name and Signature

Course Coordinator

Asst. Prof. Nermin A.Osman

Name and Signature

Head of Department

Prof.Dr. Amany Mohamed Mohamed Elmahmoudy

**COURSE
SPECIFICATION
Bachelor of Pharmacy
(Pharm D - Clinical
Pharmacy)
Biochemistry I
PB 302
Second level –Semester 3
2025-2026**

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Biochemistry I			
Course Code (according to the bylaw)	PB 302			
Department/s participating in delivery of the course	Biochemistry			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2 hr/week	1hr/week	-	3 hr/week
Course Type	Faculty requirement			
Academic level at which the course is taught	Level two/ semester three			
Academic Program	Bachelor of pharmacy (PharmD Clinical)			
Faculty/Institute	Pharmacy			
University/Academy	Zagazig			
Name of Course Coordinator	Prof. Dr./ Hoda Elsayed			
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 identify chemistry and functions of carbohydrate, lipids, proteins, enzymes, and the principles of bioenergetics, oxidative phosphorylation, porphyrin and hemoglobin.

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, porphyrin and heme.
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	Apply the principles of body function and different biochemical pathways regarding their correlation with different diseases.
3-1-3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.4.1	Select the appropriate method for assessment of carbohydrates, lipids, proteins and heme disorders, and analyze and interpret quantitative data of laboratory results in a suitable form.
4-2-2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Demonstrate good information technology skills as well as presentation skills.

4. Teaching and Learning Methods

1. Lectures
2. Practical sessions
3. Research report

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 -Definition and functions of carbohydrates. -Classification of carbohydrates (monosaccharaides, disaccharides, oligosaccharides examples with structure).	2	2	-	-	-
	- Practical session -Laboratory Safety measures	2	-	1	-	-
2	- Lecture - Physical and chemical properties of carbohydrates. -Polysaccharides: examples and classification	2	2	-	-	-
	- Practical session -Introduction on practical biochemistry.	2	-	1	-	-
3	- Lecture -Definition and function of lipids - Classification of lipids	2	2	-	-	-
	- Practical session - Separation of serum and plasma.	2	-	1	-	-
4	- Lecture -Distribution of lipids in the body - Types of fatty acids and essential fatty acids	2	2	-	-	-
	- Practical session -Qualitative tests for Lipid	2	-	1	-	-
5	- Lecture	2	2	1	-	-

	- Structure and classification of amino acids - Acidic and basic properties of amino acids					
	- Practical session - Qualitative tests for proteins	2	-	1	-	-
	Formative assessment quiz 2				-	-
6	- Lecture - Structure of proteins - Functions of proteins - Plasma proteins	2	2	-	-	-
	- Practical session - CHO chemistry	2	-	1	-	-
7	-Midterm Exam					
8	- Lecture - Biological oxidation. - Substrate level phosphorylation -Oxidative phosphorylation.	2	2	-	-	-
	- Practical session - Quantitative determination of glucose	2	-	1	-	-
9	- Lecture - Electron transport chain -Uncouplers - Energy gain from glucose oxidation in cells.	2	2	-	-	-
	- Practical session -Qualitative test for carbohydrates	2	-	1	-	-
10	- Lecture -Enzymes structure -Properties of enzymes -Mechanism of actions enzymes and coenzymes	2	2	1	-	-
	- Practical session -Activity	2	-	1	-	-

11	- Lecture - Factors affecting reaction velocity - Inhibition of enzyme activity - Regulation of enzyme activity -Correlation of enzymes with diseases	2	2	-	-	-
	- Practical session -Activity	2	-	1	-	-
	Formative assessment quiz 2				-	-
12	- Lecture -Porphyrins types. -Heme synthesis. -Regulation of heme synthesis. -Porphyria.	2	2	-	-	-
	-Practical Exam 1	2	-	1	-	-
13	- Lecture -Hemoglobin types. -Abnormal hemoglobin types. - Hemoglobinopathies.	2	2	-	-	-
	- 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.

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (Midterm exam)(Semester work)	Week 7	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 5&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)	- Student book of Biochemistry (1) approved by biochemistry department (2025-2026). -Practical notes of Biochemistry (1) approved by biochemistry department (2025-2026).
	Other References	1. Marks' basic medical biochemistry: a clinical approach (third edition); Lieberman M., Marks A.D., Smith C.M. (2020). 2. Lehninger principles of biochemistry (seventh edition); Nelson D.L., Cox M.M., Freeman W.H. (2022). 3. Lippincott's Illustrated Reviews: Biochemistry (Seventh edition); Ferrier D.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)	• 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	- Computer - White boards - Data show - Centrifuge - Spectrophotometer
	Supplies	- Chemicals - Glassware
	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.Dr./ Hoda Elsayed

Name and Signature
Head departement
Ass.Prof./ Rana Eissa

COURSE SPECIFICATION

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Pharmacognosy II

PG 303

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 (Clinical Pharmacy).			
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.

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	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.
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.C2.3.1	Develop information technology skills and 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)

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 fruits.	2	2	-	-	-
	Practical session Morphology of some important fruits.	2	-	1	-	-
2	Lecture Anise, fennel and caraway: macro-and micro morphology -, powder and chemical Identification	2	2	-	-	-
	Practical session Fennel: macro-and micro-morphology, powder and chemical identification.	2	-	1	-	-
3	Lecture Ammi visnaga, Ammi majus and Capsicum: macro-and; micro-morphology - powder and chemical identification. Formative assessment (quiz1)	2	2	-	-	-
	Practical session Anise: macro-and micro-morphology, powder and chemical identification.	2	-	1	-	-
4	Lecture Lemon and orange peel and other important medicinally used fruits: macro-and; micromorphology - powder and chemical identification.	2	2	-	-	-
	Practical session Ammi visnaga and Capsicum: macroand micro-morphology, powder and chemical identification.	2	-	1	-	-
5	Lecture Introduction to the herbs.	2	2	-	-	-
	Practical session	2	-	1	_*	-

	Morphology of some important herbs Activity: internet search about macro and. micro-morphology - powder and chemical identification, active constituents and uses of some selected fruits.					
6	Lecture Official herbs and Non-official herbs Formative assessment (quiz 2)	2	2	-	-	-
	Practical session Mentha, Thyme and vinca: macro-and micro-morphology, powder and chemical identification.	2	-	1	-	-
7	Midterm exam					
8	Lecture Introduction to subterranean organs.	2	2	-	-	-
	Practical session Morphology of some important subterranean organs. -Activity: internet search about macro and; micro-morphology - powder and chemical identification, active constituents and uses of some selected herbs.	2	-	1	_*	-
9	Lecture Liquorice and Ipeca: macro-morphology; micro-morphology powder and chemical identification. Formative assessment (quiz 3)	2	2	-	-	-
	Practical session Liquorice: macro-morphology; micromorphology powder and chemical Identification	2	-	1	-	-
10	Lecture	2	2	-	-	-

	Ginseng, ginger, curcuma and garlic: macromorphology; micro-morphology powder and chemical identification.					
	Practical session Ginger: macro-morphology; micromorphology powder and chemical Identification	2	-	1	-	-
11	Lecture Introduction to Unorganized drugs -Medicinal plants used as unorganized drugs	2	2	-	-	-
	Practical session Identification of unorganized drugs and Revision	2	-	1	-	-
12	Lecture Introduction to animal drugs -Medicinal plants used as animal drugs.	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture Drugs from marine.	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 5, 8 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	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 5,8 and 14	5	5%
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)	Student book and practical notes of “pharmacognosy II” approved by the pharmacognosy department 2025-2026.
	Other References	1- Raj K. Keservani, Nutraceutical Fruits: Overview and Disease Prevention. Apple Academic Press , 2022. 2- Michael H., Joanne B., Jose P. G., Simon G., Elizabeth M. W. (Fundamentals of Pharmacognosy and Phytotherapy), 3rd Ed., Elsevier, 2018. 3- Trease G.E. (a textbook of pharmacognosy) 16th Ed. London., New York 2017. 4- Simone B., M. C., Rupika D. (Pharmacognosy: Fundamentals, Applications and Strategies), 1st Ed, Academic Press, 2016. 5- Biren S. (Textbook of Pharmacognosy & Phytochemistry), Elsevier, India, 2013.
	Electronic Sources (Links must be added)	https://www.ekb.eg/

		- 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 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. Afaf Abd El-Ghany

Name and Signature

Head department

Assist.Prof. Dr. / Islam Moustafa

COURSE SPECIFICATION

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Biophysics

MD 303

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)	MD 303			
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) clinical pharmacy			
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.

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.C1.1.1	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.

4. Teaching and Learning Methods

- Lectures
- Practical sessions
- Research assignment

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 • Membrane action potential. Atom and radiation (the quantum model of the atom – electromagnetic spectrum)	1	1	-	-	-
	Practical session - Ion channel	2	-	1	-	-
7	Midterm exam					
8	Lecture	1	1	-	-	-

	Atom and radiation (types of - radiation – radioactive decay: α particles, β particles and γ rays)					
	Practical session -Receptors	2	-	1	-	-
9	Lecture Atom and radiation (radiation terms and units – sources of radiation – radiation risks – application of radiology)	1	1	-	-	-
	Practical session - Water homeostasis	2	-	1	-	-
10	Lecture - The anatomy of the heart and conducting system Cardiac action potential	1	1	-	-	-
	Practical session -Measuring blood pressure	2	-	1	_*	-
11	Lecture - Biophysical basics of electrocardiography measurement technique Formative assessment (quiz 2)	1	1	-	-	-
	Practical session	2	-	1	-	-

	- Action potential					
12	Lecture Biophysical basics of blood pressure measurement technique)	1	1	-	-	-
	Practical exam Discussion and Assessment of activity	2	-	1	-	-
13	Lecture - Laser technology (laser beam properties and generation) 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.

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

2. Learning Resources and Supportive Facilities *

Learning resources (books,	The main (essential) reference for the course	Course Notes
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scientific references, etc.) *	(must be written in full according to the scientific documentation method)	• Student book of Biophysics approved by biochemistry department 2025-2026 • Practical note of Biophysics approved by biochemistry department 2025-2025 Essential books • Biophysics in the Cell: For Students of the Natural Sciences, Thomas Bornschlöggl , 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, Ruyschaert , Jean Marie (2018) • Introduction to experimental Biophysics, 2nd edition - Jayl Nadeau (2018) • Membrane biophysics: New insights and methods - Hongda Wang , Guohuili (2018)
	Other References	• 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 – Nima Rezaei , Amene Saghazadeh. (2019)
	Electronic Sources (Links must be added)	• www.Pubmed.Com • www.sciencedirect.com
	Learning Platforms (Links must be added)	https://teams.microsoft.com/l/channel/19%3A5cf4ed1e90044c9ab3e2b03a9525b31b https://thread.tacv2/Biochemistry%20II?groupId=9354991d-3564-4dcb-89a8-dfc9c5f8a502&tenantId=9345a4cc-a702-4d54-b38a-a9dffc465585
	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)	--

**Name and Signature
Course Coordinator**

Prof. Dr. Mervat Asker

**Name and Signature
Head of Department**

Ass.Prof. Dr. Rana Eissa

COURSE SPECIFICATION

**Bachelor of Pharmacy
(Pharm D - Clinical Pharmacy)**

PM 301

**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			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2 hrs/week	1 hrs/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-Clinical Pharmacy)			
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
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 good laboratory practice guidelines for the safe handling, containment, and disposal of microbial cultures, biological specimens, and immunological reagents in accordance with biosafety levels and infection control protocols.
3.1.3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.4.1	Perform and interpret introductory microscopic, biochemical, and serological techniques used for identifying common microorganisms and understanding immune responses.
4.1.1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.C1.3.1	Develop effective time management in planning, prioritizing, and executing microbiology and immunology-related tasks, ensuring timely completion of theoretical, practical, and reporting activities.

4. Teaching and Learning Methods

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

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 introduction to microbiology and historical review - Introduction to immunology	2	2	-	-	-
	Practical session - Laboratory safety measures - Microscopy and general terms of microbiology	2	-	1	-	-
2	Lecture - Description of microorganisms - Classification and types of Microorganisms - Introduction to immunology	2	2	-	-	-
	Practical session Microscopical examination of Bacteria: preparation and staining of smear and simple stain	2	-	1	-	-
3	Lecture - Brief description of viruses, fungi and protozoa - Immunity – innate immunity Formative assessment (quiz1)	2	2	-	-	-
	Practical session Differential stains: Gram-stain	2	-	1	-	-
4	Lecture - Bacteria: description and classification - Cells of immune response Immunogens or antigens	2	2	-	-	-
	Practical session Differential stains: Gram-stain of mixtures of microorganisms	2	-	1	-	-

5	Lecture - Anatomy and structure of bacterial cells - Acquired immune response: Cell mediated immunity	2	2	-	-	-
	Practical session Differential stain: Acid-fast stain (Ziehl Neelsen stain)	2	-	1	-	-
6	Lecture - Growth and cultivation of bacteria, bacterial growth curve - Humoral immune response And Cytokines	2	2	-	-	-
	Practical session Spore stain	2	-	1	-	-
7	Periodical exam					
8	Lecture - Microbial metabolism - Agglutination and complement fixation reactions	2	2	-	-	-
	Practical session Cultivation of bacteria: types of common culture media and growth conditions	2	-	1	-	-
9	Lecture Microbial metabolism	2	2	-	-	-
	Practical session Biochemical activities and identification of bacteria	2	-	1	-	-
10	Lecture - Microbial metabolism - Hypersensitivity reactions Activity Formative assessment (quiz 2)	2	2	-	-*	-
	Practical session Serological reactions (Precipitation reactions)	2	-	1	-	-

11	Lecture • Microbial genetics • Transplantation immunology	2	2	-	-	-
	Practical session • Serological reactions (Agglutination reactions)	2	-	1	-	-
12	Lecture • Transcription and Protein synthesis Autoimmune diseases	2	2	-	-	-
	Practical session • Serological reactions (Complement fixation reaction)	2	-	1	-	-
13	Lecture • Genetic variation Genetic Transfer among bacteria	2	2	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture • 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.

1. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
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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</u> /Clinical/... Exam	Week 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (<u>Self-learning Activity</u>)	Weeks 10,14	5	5%
7	Assignment (<u>Formative assessment</u>)	Weeks 3,10	-	-
8	Other (Mention)	-	-	-

5. 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	- Willey, J. M., Sherwood, L. M., & Woolverton, C. J. (2019). Prescott’s Microbiology (11th ed.). McGraw-Hill Education. - 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)	- EKB https://www.ekb.eg/ - Pubmed (https://pubmed.ncbi.nlm.nih.gov/). - Science direct (https://www.sciencedirect.com/).
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig</u>	http://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin

	<u>University for students</u>	
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board, and Light microscopes
	Supplies	Culture media, Petri dishes, Bacteriological loops, 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**

Prof. Ashraf Ahmed Kadry

**Name and Signature
Head of Department**

Ass. Prof. Momen Askoura

COURSE SPECIFICATION

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Pharmaceutics I

PT 303

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 (Clinical Pharmacy)			
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 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 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

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.C1.5.1	Solve pharmaceutical calculations problems

4. Teaching and Learning Methods

7. Lectures (data show, board)
8. Practical sessions
9. Problem solving (Practical)
10. Self- Learning (Activity)

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 solutions	2	2	-	-	-

	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	Midterm exam					
8	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	-	-
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					

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	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)	-	-	-

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 “Pharmaceutics I” approved by Pharmaceutics department 2025-2026.
	Other References	- 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 - 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 7 th 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	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. Shereen Sabry

COURSE SPECIFICATION

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Physiology and Pathophysiology

MD 304

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	Practical	Other (specify)	Total
	2 hrs/week	1 hrs/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 (clinical pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof.Dr.Atef Saad			
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 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	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.
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.

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.C1.1.1	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

7. Lectures (data show , board)
8. Practical sessions
9. Co-operative Learning (Activity)
10. Self -Learning (Activity)

5. Course schedule :

Num ber of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discu ssion groups/)	Training (Practical/ Clinical/)	Self- learning (Tasks/ Assignments / Projects/ ...)	Other (to be determined)
1	Lecture -Cell physiology and cancer	2	2	-	-	-
	Practical session - Lab safety rules - Pathophysiology of cancer	2	-	1	-	-
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	2	2	-	-	-
	Formative assessment (quiz 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 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 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)	- Student book of "Physiology and Pathophysiology " approved by the pharmacology and toxicology department 2025-2026.
	Other References	3. Essentials of pathophysiology: concepts of altered health states: Wolters Kluwer Philadelphia. Porth, C., & Gaspard, K. J. (2015), 3rd ed. 4. Essentials of anatomy and physiology: FA Davis. Scanlon, V. C., & Sanders, T. (2018), 8th ed.
	Electronic Sources (Links must be added)	- 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</u> <u>Faculty of Pharmacy-</u> <u>Zagaig University for</u> <u>students</u>	http://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	- White boards, data show, ai conditioned classroom - Well-equipped labs.
	Supplies	-
	Electronic Programs	6. Microsoft office 7. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator
Prof.Dr. Atef Saad

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



وحدة ضمان الجودة



كلية الصيدلة
FACULTY OF PHARMACY

Semester 4

COURSE SPECIFICATION

Bachelor of Pharmacy

**(Pharm D - Clinical
Pharmacy)**

PB403

Biochemistry II

Second level –Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Biochemistry II			
Course Code (according to the bylaw)	PB403			
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
	2 hrs/week	1 hrs/week	-	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 clinical pharmacy)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig University			
Name of Course Coordinator	Prof. Dr. Mervat Asker			
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 different metabolic pathways of carbohydrates, lipids, proteins, their inborn errors and integration of metabolism. Also enables them to analyze and interpret experimental results.

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	Outline the principles of absorption, digestion and metabolism of carbohydrates, lipids and proteins; recognize the relation between metabolism and inborn errors of metabolism.
		1.C1.3.2	Demonstrate oxidative stress/antioxidants and their relation to health and diseases.
		1.C1.3.3	Integrate different metabolic pathways and discuss regulatory factors affecting them.
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 biological samples and chemical reagents safely.
3.1.1	Apply the principles of body functions and basis of genomics in health and disease states to manage different diseases.	3.C1.1.1	Correlate between different metabolic pathways and their role in the pathogenesis of different diseases.
3.1.3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.4.1	Perform biochemical laboratory tests using biological samples to detect different analytes and metabolites
		3.C1.4.2	Interpret laboratory results in suitable form to achieve an accurate diagnosis.

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
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills	4.C2.3.1	Write and present reports effectively and develop self-learning skills.

3. Teaching and Learning Methods

- Lectures
- Practical sessions
- Interactive learning (open discussion)
- Self-learning (activity: reports and presentations)
- Blended- learning (Activity)

Course schedule:

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 - Carbohydrates digestion and absorption - Sugar interconversion - Glycolysis (Reactions, steps and regulation)	2	2	-	-	-
	Practical session Laboratory safety measures	2	-	1	-	-
2	Lecture - Gluconeogenesis (Reactions and regulation) - Tricarboxylic acid cycle (Reactions, regulation and calculation of energy produced)	2	2	-	-	-
	Practical session Glycated hemoglobin and Fructosamine	2	-	1	-	-

3	Lecture • HMP shunt (Reactions and functions) • Uronic acid pathway (Reactions)	2	2	-	-	-
	Practical session • Lipid profile (triglycerides)	2	-	1	-	-
4	Lecture • Glycogen metabolism • Glycogenesis regulation • Glycogenolysis regulation • Hormonal regulation of carbohydrates metabolism • Inborn errors of metabolism (carbohydrates metabolism)	2	2	-	-	-
	Practical session • Lipid profile (total cholesterol)	2	-	1	-	-
5	Lecture • Digestion and absorption of lipids • Oxidation of fatty acids • Formative assessment (quiz 1)	2	2	-	-	-
	Practical session • Quantitative determination of serum triglycerides	2	-	1	-	-

6	Lecture • Lipogenesis • Lipolysis in adipose tissues. • Phospholipid metabolism	2	2	-	-	-
	Practical session • Quantitative determination of serum total cholesterol	2	-	1	-	-
7	Mid-term Exam					
8	Lecture • Ketone bodies and cholesterol metabolism	2	2	-	-	-
	Practical session • Methods of determination of HDL-c and LDL-c	2	-	1	-	-
9	Lecture • Lipoprotein metabolism • Regulation of lipid metabolism • Inborn errors of metabolism (lipid metabolism)	2	2	-	-	-
	Practical session • Protein metabolism (urea & creatinine)	2	-	1	-	-
10	Lecture • Protein turnover • Digestion and absorption of dietary proteins. • Nitrogen metabolism	2	2	-	-*	-

	Transamination					
	Practical session Determination of serum urea	2	-	1	-	-
11	Lecture - Deamination - Transdeamination - Metabolism of ammonia - Urea cycle	2	2	1	-	-
	Practical session Revision and open discussion	2	-	1	-	-
12	Lecture Conversion of amino acids to specialized products metabolism	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture - Conversion of amino acids to specialized products (continue) - Regulation of proteins metabolism - Inborn errors of metabolism (proteins metabolism) Formative assessment (quiz 2)	2	2	-	-	-
	Practical session	2	-	1	_*	-

	Activity presentation and assessment					
14	Lecture Revision and open discussion	2	2	-	-	-
	Practical session Activity presentation and assessment	2	-	1	_*	-
15	Final exam					

* As part of a self-learning activity in biochemistry II, 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 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

4. 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	Weeks 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 5,13	-	-
8	Other (Mention)	-	-	-

5. 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 Biochemistry II approved by biochemistry department 2025 -2026. • Practical notes of Biochemistry II approved by biochemistry department 2025- 2026. • Marks' basic medical biochemistry: a clinical approach (6th Edition); Lieberman M., Marks A.D., Peet MD, Alisa. (2022). • Lehninger principles of biochemistry (eighth edition); Nelson D.L.; Cox M.M. (2021). • Basic concepts in biochemistry (2nd Edition); Gilbert H.F.; The McGraw Hill companies Inc. (2000). • Lippincott's Illustrated Reviews: Biochemistry (eighth edition); Abali E.E; Cline S.D; Franklin D.S; Viselli S.M. (2021)
	Other References	• Biochemistry (Seventh Edition); Garrett R.H. and Grisham C.M.; Thomson learning, Inc (2024). • Harper's Illustrated Biochemistry (32nd edition); Rodwell V.W., Bender D., Botham K.M., Kennelly P.J., Weil P. A. (2022). • Clinical Biochemistry made ridiculously simple (4th edition); Stephen Goldberg. M.D.; Med Master Inc. (2023).
	Electronic Sources (Links must be added)	• Egyptian J. of biochem. and molecular biology (https://ejb.journals.ekb.eg/). • Egyptian Pharmaceutical Journal (https://epj.journals.ekb.eg/). • Pubmed (https://pubmed.ncbi.nlm.nih.gov/). • Science direct (https://www.sciencedirect.com/).
	Learning Platforms (Links must be added) Electronic platform of Faculty of Pharmacy- Zagaig University for students	• https://shorturl.at/sar8D
Supportive facilities & equipment for teaching	Devices/Instruments	- Data show - White board - Spectrophotometer
	Supplies	- Glass - Eppendorf tubes - Beakers

and learning		- Chemical kits
	Electronic Programs	- Microsoft office - Microsoft teams
	Skill Labs/ Simulators	- --
	Virtual Labs	- --
	Other (to be mentioned)	- --

Name and Signature
Course Coordinator

Prof. Dr. Mervat Asker

Name and Signature
Head of Department

Ass. Prof. Dr. Rania Eissa

**COURSE
SPECIFICATION
Bachelor of Pharmacy
(Pharm D - Clinical
Pharmacy)
Instrumental Analysis
PA 403
Second level –Semester 4
2025-2026**

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Instrumental Analysis			
Course Code (according to the bylaw)	PA 403			
Department/s participating in delivery of the course	Analytical Chemistry			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 hrs/week	1 hr/week		2 hrs
Course Type	Faculty requirement			
Academic level at which the course is taught	Level 2- semester 4			
Academic Program	Bachelor of Pharmacy (Pharm D- Clinical Pharmacy)			
Faculty/Institute	Pharmacy			
University/Academy	Zagazig			
Name of Course Coordinator	Prof.Dr.soad Selem			
Course Specification Approval Date	8/18/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Approval at department council			

2. Course Overview (Brief summary of scientific content)

Illustrate the theory and application of spectrophotometry, spectrofluorimetry, atomic absorption spectrometry and chromatography, describe composition and mechanism of each studied instrument and apply studied quantitative methods for determination of different pharmaceutical compounds

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 theories of spectrophotometry, spectrofluorimetry, atomic absorption spectrometry and chromatography
		1.C1.2.2	Illustrate applications of spectrophotometry, spectrofluorimetry, atomic absorption spectrometry and chromatography
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.C2.7.1	Describe the principles of various instruments and analytical techniques.
		2.C2.8.1	Select the appropriate methods for synthesis and analysis of different pharmaceuticals.
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.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Demonstrate problem solving, and decision-making skills.

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
4.2.2	Use contemporary technologies and media to demonstrate effective	4.C2.3.1	Demonstrate good information technology skills as well as presentation skills.

4. Teaching and Learning Methods

1. Lectures (data show, board)
2. Practical sessions
3. Problem solving (practical)
4. Self-learning (activity)
5. Blended learning (activity)

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.	1	1	-	-	-
	Practical session Safety guidelines	2	-	1	-	-
2	Lecture - Spectrophotometry Electromagnetic radiation, light as energy, types of electronic transitions, laws of light absorption and Bouguert-lambert's law.	1	1	-	-	-
	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.	1	1	-	-	-
	Practical session - Determination of $\lambda_{\max}$.	2	-	1	-	-
4	Lecture - Spectrophotometry Colorimetry, general requirements of the coloured product, general requirement of an ideal chromogen. Formative assessment (quiz1)	1	1	-	-	-
	Practical session - Determination of KMnO_4 spectrophotometrically	2	-	1	-	-

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

9	Lecture -Atomic absorption spectrometry Instrumentation and Quantitative determination methods. Theory of flame emission, instrumentation and applications. Formative assessment (quiz 2)	1	1	-	-	-
	Practical session Chromatography Chemical separation parameters	2	-	1	-	-
10	Lecture Chromatography Introduction, comparison between the classical and modern LC.	1	1	-	-	-
	Practical session - Activity	2	-	1	_*	-
11	Lecture Chromatography Theoretical aspects, principles of chromatography, parameters of chromatography, techniques of chromatography.	1	1	-	-	-
	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.	1	1	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture Open discussion	1	1	-	-	-
	Practical exam Discussion and Assessment of activity	2	-	1	_*	-
14	Lecture General revision	1	1	-	-	-
	Practical exam 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. 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. 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	12	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Weeks 10,13,14	5	5%
7	Assignment (Formative assessment)	Weeks 4,9	-	-
8	Other (Mention)	-	-	-

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific)	The main (essential) reference for the course (must be written in full according to the scientific documentation method) 1- Course Notes Lecture notes and department notes 2- Essential Books (Text Books) i- F. Rouessac, A. Rouessac "Chemical Analysis:
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references, etc.) *		Modern Instrumental Methods and Techniques" 4th edn, John Wiley & Sons, Ltd., New York (2022).
	Other References	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) <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	1. Microsoft office 2. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator
 Prof.Dr.soad Selem

Name and Signature
Head of department
 Prof.Dr.soad Selem

COURSE SPECIFICATION

Bachelor of Pharmacy

(Pharm D - Clinical

Pharmacy)

Pharmaceutical Microbiology

PM 402

Second level –Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmaceutical Microbiology			
Course Code (according to the bylaw)	PM 402			
Department/s participating in delivery of the course	Microbiology and Immunology			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2 hr	1 hr	-	3 hr
Course Type	Faculty Requirements			
Academic level at which the course is taught	level 2/ semester 4			
Academic Program	Bachelor of Pharmacy (Pharm D) (Clinical Pharmacy Program)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig University			
Name of Course Coordinator	Prof. Dr. Hisham Abbas			
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 student will be able to:

On completion of the course, this course enables students to Illustrate the different types of antimicrobial agents as well as the sources and control of microbial contamination of the pharmaceutical products and Outline the concepts of sterilization, its different methods, applications and sterility testing.

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.C1.2.1	Outline the principles of pharmaceutical microbiology: sterility testing and sterility assurance
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8.1	Outline the basic concepts of sterilization, its different methods and its applications & different types of antimicrobial agents and their mechanism of action
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations	1.C1.12.1	Illustrate the concepts of microbiological quality control of pharmaceutical products and evaluation of preservatives
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 basic biohazards and chemicals effectively and safely.
2.3.2	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of	2.C3.2.1	Apply GLP guidelines for safe handling and disposal of pharmaceutical materials and products & Advise health care

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
	biologicals, and pharmaceutical materials/products		professionals and patients for rational use of drugs and problems of misuse of antimicrobial agents
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.7.1	Evaluate the selected drug therapy based on the patient's progress and laboratory results.
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Demonstrate good information technology skills as well as presentation skills.

4. Teaching and Learning Methods

1. Lectures
2. Practical sessions
3. Self-learning
4. Microsoft Teams

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 Control of microorganisms by sterilization and survival curve	2	2	-	-	-
	Practical session Laboratory safety Measures	2	-	1	-	-
2	Lecture Methods of sterilization and sterilizers	2	2	-	-	-
	Practical session Sterility testing	2	-	1	-	-
3	Lecture Sterilization of pharmaceutical products Antibiotic susceptibility testing: Kirby-Bauer method	2	2	-	-	-
	Practical session Antibiotic susceptibility testing: Kirby-Bauer method	2	-	1	-	-
4	Lecture Sterilization control and sterility testing Formative assessment (quiz 1)	2	2	-	-	-
	Practical session Practical determination MIC by broth dilution	2	-	1	-	-
5	Lecture sterilization parameters and sterility assurance	2	2	-	-	-
	Practical session Practical determination MIC by agar dilution	2	-	1	-	-

6	Lecture Disinfection and antisepsis: chemical agents used as disinfectant and antiseptic Factors affecting the activity of disinfectant and antiseptic Evaluation of disinfectant and antiseptic	2	2	-	-	-
	Practical session Practical AB Assay	2	-	1	-	-
7	Midterm exam					
8	Lecture - Sources of microbial contamination and spoilage of pharmaceutical products and factors affecting them Control of microbial spoilage Good Manufacture Practice	2	2	-	-	-
	Practical session <i>Determination Temp coefficient</i>	2	-	1	-	-
9	Lecture Preservation of pharmaceutical products and preservatives commonly used Factors affecting preservative activity Evaluation of preservative's efficacy	2	2	-	-	-
	Practical session <i>Determination concentration coefficient</i>	2	-	1	-	-
10	Lecture Introduction - Definitions and terminology Antibiotic and chemotherapeutic agents Mechanisms of action of antimicrobial agents Formative assessment (quiz 2)	2	2	-	-	-
	Practical session PrepaDetermination of heat killed vaccin vaccine Formative assessment (quiz 2)	2	-	1	-	-

11	Lecture Classification of antimicrobial agents: Drugs acting on cell wall Drugs acting on cell membrane Methods of sterilization and sterilizers	2	2	-	-	-
	Practical session Determination of phenol-coefficient: Chick-Martin method <i>Activity (Poster)*</i>	2	-	1	-	-
12	Lecture Classification of antimicrobial agents: Drugs inhibiting protein synthesis Drugs inhibiting nucleic acid synthesis Antimetabolites Formative assessment (quiz 3)	2	2	-	-	-
	Practical session Determination of phenol-coefficient by 3 radial walker	2	-	1	-	-
13	Lecture Antituberculous drugs Antileprosy agents Antifungal drugs	2	2	-	-	-
	Practical test	2	-	1	-	-
14	Lecture Antiprotozoal drugs Antiviral drugs	2	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	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 1 written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final <u>Practical</u> /Clinical/... Exam	Weeks 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (<u>Self-learning Activity</u>)	Weeks 11,14	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)	* Course Notes: "Notes on Pharmaceutical Microbiology" Essential Books (Text Books) * Hugo WB and Russell AD "Pharmaceutical Microbiology" 9th edn, Blackwell Scientific Editions; London (2015).
	Other References	*"Sterilization, Disinfection and Preservation" 8th edn, Ed Block SS, Lippincott Williams & Wilkins, London (2019). *"Antibiotics in Laboratory Medicine", 9 th edition, Ed Lorian V, Williams and Wilkins, Baltimore (2019). *"Molecular Biotechnology", Pasternak G, ASM press, Washington DC (2016).
	Electronic Sources (Links must be added)	http://medicaleducationonline.org/ http://medicaleducationonline.org/ http://www.parasitesonline.net

		http://pathmicro.med.sc.edu/book/parasit-sta.htm http://www.dpd.cdc.gov/dpdx/HTML/Para_Health.htm
	Learning Platforms (Links must be added)	http://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Black (white) boards, overhead projectors and data show
	Supplies	Chemicals, Autoclaves, Incubators, Ovens, Water bathes, staining dyes, microscopes, refrigerators and microbiological culture media
	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*

Course Coordinator

Prof. Dr. Hisham Abbas.

Head of Department

Ass.Prof. Moamen Askoura

COURSE SPECIFICATION

Bachelor of Pharmacy

**(Pharm D - Clinical
Pharmacy)**

Pharmaceutics II

PT 404

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	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 4			
Academic Program	Bachelor of Pharmacy Pharm D (Clinical Pharmacy)			
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 involves principles of formulation, development, sterilization, packaging and quality control testing of topical include (creams, ointments, gels and pastes) and transdermal drug systems (TDDS), Rectal, ocular and pulmonary dosage forms.

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 the principles, properties, types and applications of different dosage forms including: rectal, ocular, pulmonary, topical and transdermal drug delivery systems (TDDS).
		1.C1.2.2	Illustrate methods of preparation of different dosage forms including: rectal, ocular, pulmonary, topical 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	Apply different methods for preparation of semisolid preparations, suppositories, pulmonary, ophthalmic 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.
4-1-1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.C1.3.1	Perform tasks within time limit.

4. Teaching and Learning Methods

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

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 cold cream	2	-	1	-	-
3	Lecture - methods of maximizing the bioavailability of drugs applied to the skin -Transdermal therapeutic patches(TTS)	2	2	-	-	-
	Practical session Preparation of vanishing cream	2	-	1	-	-
4	Lecture Topical dosage forms Ointments Advantages and disadvantages Characters of ideal bases Formative assessment (quiz1)	2	2	-	-	-
	Practical session Suppositories -calculation of displacement value for zinc oxide & calamine	2	-	1	-	-
5	Lecture Cream -Advantages and disadvantages -Types and preparation,	2	2	-	-	-
	Practical session Preparation of Boric acid suppositories	2	-	1	-	-

6	Lecture Gels & pastes -Advantages and disadvantages -Characters of ideal bases - Methods of preparation.	2	2	-	-	-
	Practical session Preparation of Iodine suppositories	2	-	1	-	-
7	Midterm exam					
8	Lecture Ocular drug delivery systems eye structure, major types of drugs used ophthalmically factors affecting bioavailability, classification of ocular drug delivery systems, sterilization, preservation.	2	2	-	-	-
	Practical session Preparation of glycerin soap suppositories	2	-	1	-	-
9	Lecture Pulmonary drug delivery systems - Anatomy of the lungs - Advantages and factors influencing pulmonary drug delivery	2	2	-	-	-
	Practical session -Preparation of Unna's paste	2	-	1	-	-
10	Lecture - Aerosols, Nebulizer, pressurized Metered Dose Inhalers, Dry powder inhalers: characters and preparation - Applications of pulmonary drug delivery Formative assessment (quiz 2)	2	2	-	-	-
	Practical session Preparation of sulfur ointment	2	-	1	_*	-
11	Lecture Rectal drug delivery systems; Suppositories -Definition -Characters of ideal bases -Advantages and disadvantages of suppositories	2	2	-	-	-
	Practical Exam -Solving Isotonicity problems	2	-	1	-	-

12	Lecture Rectal drug delivery systems; -Bases of suppositories -Preparation of Suppositories	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture - Other rectal dosage forms e.g. gel, cream, ointment and solution.	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					

5. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (<u>Mid-term Exam</u>)	Week 7	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)	-	-	-

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 “Pharmaceutics II” approved by Pharmaceutics department 2025-2026.
	Other References	- Transdermal Drug Delivery: Concepts and Application, Author: Kevin Ita Publisher: Academic Press (2020) - 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 - Practical Pharmaceutics – Part 3: Rectal and Vaginal Dosage Forms (Chapter in <i>Practical Pharmaceutics</i>): 2015, Editors: Yvonne Bouwman-Boer, Vincent H.L. Leeuwenburgh, Piet de Boer - Ophthalmic Drug Delivery (MDPI Books, 2nd Edition): 2023, Editor: Uday B. Kompella - Pulmonary Drug Delivery Systems: Material and Technological Advances: 2023, Editors: Chander Prakash, Chandra P. Sharma - Ansel’s Pharmaceutical Dosage Forms and Drug Delivery Systems (12th Edition): 2022, Authors: Loyd V. Allen Jr., Nicholas G. Popovich, Howard C. Ansel - Remington: The Science and Practice of Pharmacy is the 23rd edition, published on October 30, 2020. Publishing Company, Academic Press.
	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	Devices/Instruments	Computer, board
	Supplies	Chemicals, Glassware, digital balance and water bathes
	Electronic Programs	3. Microsoft office

and learning *		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. Shereen Sabry

**COURSE
SPECIFICATION
Bachelor of Pharmacy
(Pharm D - Clinical
Pharmacy)
Pharmacology I
PO 401
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	Practical	Other (specify)	Total
	2 hrs/week	1 hrs/week	-	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, Clinical Pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Salah Ghareib			
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	1.C1.10.1.	Explain pharmacological properties of Autonomic nervous system acting drugs including mechanism

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
	evaluate their appropriateness, effectiveness, and safety in individuals and populations.		of drug action, adverse reactions, contraindications, and drug-drug interactions.
		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.C2.10.1.	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.C2.10.2.	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.

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
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1.	Apply appropriate information technology tools and effectively communicate pharmacological concepts through structured oral or visual presentations

4. Teaching and Learning Methods

5. Lectures (data show, board)
6. Practical labs
7. Simulation-based education (Practical)
8. Problem -based learning (Practical)
9. Self- learning (Activity)
10. Blended- learning (Activity)

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	2	-	1	-	-

	Contraction Using the Organ Bath Simulation Program, Performing 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	Midterm exam					
8	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	-	-
9	Lecture -Sympatholytics -Adrenergic neuron blockers	2	2	-	-	-

	Practical session Student Application and Problem Solving: Investigating the Effects and 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.	2	-	1	-	-
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.

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	Weeks 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (Self-learning Activity)	Weeks 11,14	5	5%
7	Assignment (Formative assessment)	Weeks 4,10,12	-	-
8	Other (Mention)	-	-	-

6. Learning Resources and Supportive Facilities *

Learning resources (books, scientific	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.
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references, etc.) *	Other References	1. Richard A. Harvey, Michelle A. Clark, Lippincott's Illustrated Reviews Pharmacology 9th ed. Lippincott Williams & Wilkins, 2025. 2. Katzung, B.G., ed. Basic and Clinical Pharmacology. 16th ed. New York: McGraw Hill, 2023. 3. Hardman J.G., L.E. Limbrid, and A.G. Gilman, eds. Goodman & Gilman's the Pharmacological Basis of Therapeutics. 14th ed. New York : McGraw Hill, 2022. 4. H.P.Rang,M.M.Dale,J.M.Ritter& R.J. Flower ed. RANG & DALE Pharmacology 9th 2020 Churchill 2. Livingstone Elsevier London. 5. Bennet P.N., and M.J. Brown, eds. Clinical Pharmacology. 12th ed. London :Churchil Livingstone, 2019. 6. Luellmann H., L. Hein, K. Mohr, and D. Bieger. Color Atlas of Pharmacology. 5th ed. Stuttgart :Thieme, 2017.
	Electronic Sources (Links must be added)	• 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
	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	Devices/Instruments	Computer, board
	Supplies	-----
	Electronic Programs	7. Microsoft office 8. Microsoft teams

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

Name and Signature
Course Coordinator
Prof. Dr. Salah Ghareib

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

COURSE SPECIFICATION
Bachelor of Pharmacy
(Pharm D - Clinical Pharmacy)
Pharmacy Legislation and
practice ethics
NP 404
Pharm D
(Clinical pharmacy)
Second level –Semester 4
2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacy Legislation and practice 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	Compulsory			
Academic level at which the course is taught	second level/ fourth semester			
Academic Program	Bachelor of pharmacy (Pharm D Clinical pharmacy)			
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
2-1-1	Perform responsibilities and authorities in compliance with the legal and professional structure and role of all members of the health care professional team	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

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.C1.3.1	Describe legal principles for non narcotics and narcotics prescription
2-1-2	Adopt ethics of health care and pharmacy profession respecting patients' rights and valuing people diversity	2.C1.5.1	State patient rights in different cases involving misconduct of pharmacy practice laws
2-5-1	Fulfill the requirements of the regulatory framework to authorize a medicinal product including quality, safety, and efficacy requirements.	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

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 الصيدلانية الصيدليات العامة	1	1	-	-	-
3	المؤسسات الصيدلانية الصيدليات الخاصة مخازن الادوية المصانع formative assessment quiz1	1	1	-	-	-
4	المؤسسات الصيدلانية مجال الاتجار في النباتات الطبية	1	1	-	-	-
5	المستحضرات الصيدلانية الخاصة و الدستورية	1	1	-	-	-
6	مسئوليات وواجبات الصيدلي تجاه المريض و الطرق السليمة التي يتبعها الصيدلي مع المريض	1	1	-	-	-
7	Mid term exam					
8	اخلاقيات مزاولة المهنة	1	1	-	-	-
9	القواعد العامة التي تحكم اخلاقيات المهن الطبية	1	1	-	-	-
10	علاقة الصيدلي بالمجتمع formative assessment quiz2	1	1	-	-	-
11	قانون مكافحة المخدرات و تنظيم استعمالها و الاتجار فيها Activity	1	1	-	-	-
12	جداول قانون مكافحة المخدرات اخلاقيات 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					

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	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

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 of Pharmacy legislation and professional ethics approved by pharmaceuticals department 2025-2026
	Other References	Pharmacy practice and the law, Third Edn., Jones and Bartlett publishers, Inc., Boston, USA, 2004. 2. Remingtons, The science and practice of pharmacy, 20 th Edn., published by Philadelphia college of pharmacy and science, Philadelphia, USA, 2000. Modern pharmaceuticals, Third Edn., G.S. Banker and Ch.T. Rhodes, Marcel Dekker, Inc., New York, USA, 1996

		2.Textbook of Non-prescription drugs. AmericanPharmaceutical Association
	Electronic Sources (Links must be added)	https://1999.tel/ https://www.mohp.gov.eg/ متابعة موقع النقابة العامة للصيادلة وكذلك مواقع وزارة الصحة علي 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**

**Name and Signature
Head of Department
Prof. Dr Shereen Sabry**

COURSE SPECIFICATION

**Bachelor of Pharmacy
(Pharm D - Clinical
Pharmacy)**

**Scientific Writing and
Communication skills**

NP 403

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) (Clinical Pharmacy)			
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.C5.6.1	Organize and compose a scientific paper in accordance with the IMRAD (Introduction, Methods, Results and Discussion) model
		2.C5.6.2	Analyze and review scientific papers in terms of key message, consistency and justification
		2.C5.6.3	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.C2.3.1	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 Formative assessment (quiz1)	1	1	-	-	-
	Practical session Building results section	2	-	1	-	-
6	Lecture The Discussion Section Conclusion Citations Plagiarism	1	1	-	-	-
	Practical session Building discussion Section Conclusion Citations	2	-	1	-	-
7	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 Interprofessional Collaboration	1	1	-	-	-
	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	10	10%
3	Final Written Exam	Week 15	60	60%
4	Practical Exam	Week 13	25	25%
5	Final Oral Exam	-	-	-
6	Activity	Weeks 12	5	5%
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)	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.
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	Other References	7. Hasan, S. (2008), A Tool to Teach Communication Skills to Pharmacy Students. American journal of pharmaceutical education, 72(3), 76 8. Lemay, J., Waheedi, M., Al-Sharqawi, S., & Bayoud, T. (2018). Pharmacist–patient communication: A review of the literature. Research in Social and Administrative Pharmacy, 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
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 SPECIFICATION

Bachelor of Pharmacy

**(Pharm D - Clinical
Pharmacy)**

Principles of quality assurance

UR405

Second level –Semester 4

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Principles of Quality Assurance			
Course Code (according to the bylaw)	UR 405			
Department/s participating in delivery of the course	-----			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 hrs/week	-	-	1 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 (Clinical Pharmacy)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig University			
Name of Course Coordinator	Prof. Dr. Abdalla Elshanawany			
Course Specification Approval Date	25/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Quality assurance Council			

2. Course Overview (Brief summary of scientific content)

This course enables students to recognize quality assurance definitions, principle, Definition of accreditation, importance and types Analyze and interpret experimental results, in addition to the basic concepts of quality in education: program, course, intended learning outcomes and competency. Moreover, Team skills, quality tools and their continuous improvement.

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	Define different terminologies related to quality in education including accreditation, vision, mission, academic guidance, survey, program and course specification, ILOs and others.
		1.C1.5.2	Outline accreditation standards, responsibilities of quality assurance unit as well as elements of strategic plan.
		1.C1.5.3	Illustrate the importance of implementation of quality assurance in education, steps of accreditation process as well as different tools of quality including process flow chart.
		1.C1.5.4	Describe different models of quality improvement, leadership types, and steps of team formation and determination of customer needs.
2.6.1	Apply the principles of business administration and management to ensure rational use of financial and human resources.	2.C6.1.1	Develop an integrated understanding of organizational and management principles through strategic planning, quality assurance standards, evaluation and decision-making processes, teamwork, and continuous improvement cycles in educational institutions.

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
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills	4.C2.3.1	Use available technologies and other media to demonstrate effective presentation abilities and develop self-learning skills.

4. Teaching and Learning Methods

- Lectures
- Solving different assignments
- Brain storming, group discussion and role play

5. Course schedule:

Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussions on groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Introduction – The National Authority for Quality Assurance and Accreditation of Education (NAQAAE) and its Relationship with Educational Institutions	1	1	-	-	-
2	Terms and Concepts of Quality and Accreditation	1	1	-	-	-
3	• Methodology of Strategic Planning Environmental Analysis	1	1	-	-	-
4	The Implementation Plan of the Strategic Plan	1	1	-	-	-

	Formative assessment (quiz 1)					
5	Competitive Positioning	1	1	-	-	-
6	Institutional Accreditation Standards and Indicators	1	1	-	-	-
7	- Mid-term Exam					
8	Evaluation Process and Decision-Making	1	1	-	-	-
9	Dimensions and Standards for Program Evaluation and Accreditation	1	1	-	-	-
10	National Academic Reference Standards (NARS) for Pharmacy Education within the Competency Framework (2017)	1	1	-	-	-
11	Program Specification – Course Specification – Course Specification for Principles of Quality	1	1	-	-	-
12	Teamwork in Educational Quality Formative assessment (quiz 2)	1	1	-	-	-
13	Plan-Do-Study-Act (PDSA) Cycle	1	1	-	-	-
14	-Revision and assignments assessment	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 1 written (Mid-term Exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	75	75%
4	Final Practical /Clinical/... Exam	-	-	-
5	Final Oral Exam	-	-	-
6	Project (Self-learning Activity)	Weeks 14	15	15%
7	Assignment (Formative assessment)	Weeks 4,12	-	-
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)	• دليل الاعتماد لمؤسسات التعليم بالعالى الاصدار الثانى الهيئه القوميه لضمان جوده التعليم والاعتماد - 2015 • المعايير الاكاديمية الوطنية المرجعية للتعليم الصيدلي في اطار الجدارات جامعه الزقازيق-كلية الصيدلة- لانحه بكالوريوس فارم دى كLINICAL NARS 2017
	Other References	• Newcomer, K. E., Hatry, H. P., & Wholey, J. S. (Eds.). (2015). Handbook of practical program evaluation (Vol. 864). Hoboken, NJ: John Wiley & Sons. • Keating, S. B. (2014). Curriculum development and evaluation in nursing. Springer Publishing Company. • Shawer, S. F. (2013). Accreditation and standards-driven program evaluation: implications for program quality assurance and stakeholder professional development. Quality & Quantity, 47(5), 2883-2913.
	Electronic Sources (Links must be added)	• الهيئه القومية لضمان جودة التعليم والاعتماد (https://naqaee.gov/) • National authority for quality assurance and accreditation of education (https://naqaee.gov/en/) • Egyptian knowledge bank (https://ekb.gov/)

	Learning Platforms (Links must be added) Electronic platform of Faculty of Pharmacy- Zagaig University for students	• https://shorturl.at/sar8D
Supportive facilities & equipment for teaching and learning	Devices/Instruments	- Data show - White board
	Supplies	-
	Electronic Programs	- Microsoft office - Microsoft teams
	Skill Labs/ Simulators	- --
	Virtual Labs	- --
	Other (to be mentioned)	- --

Name and Signature

Course Coordinator

Prof. Dr. Abdalla Elshanawany

Program Coordinator

Ass. Prof. Yasmin Sharaf