



وحدة ضمان الجودة



كلية الصيدلة
FACULTY OF PHARMACY

Courses Specifications Faculty of Pharmacy

**Bachelor of pharmacy (Pharm D –
Clinical Pharmacy) Program**

Fifth level

2025-2026



وحدة ضمان الجودة



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وحدة ضمان الجودة



كلية الصيدلة
FACULTY OF PHARMACY

Semester 9

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Basic & Clinical Toxicology

PO 906

Fifth level –Semester 9

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Basic & Clinical Toxicology			
Course Code (according to the bylaw)	PO 906			
Department/s participating in delivery of the course	Pharmacology and Toxicology Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	2 hrs/week	1	-	3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 5- semester 9			
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 A. 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)

On completion of the course, the student will be able to understand toxic substances, their mechanisms of action, target organ toxicity, and clinical management. Recognize the signs, symptoms, and health risks associated with exposure to various toxic substances such as heavy metals, gases, natural poisons, pesticides, and radiation. Describe the principles of reproductive and genetic toxicology and detect toxic agents, and interpret analytical results in a forensic context. The students will be prepared for professional roles in clinical, forensic, and public health contexts.

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.C1.6.1	Define key concepts related to toxicology, including classifications, mechanisms of toxicity, and target organ effects and management of toxicity.
		1.C1.6.2	Recognize the signs, symptoms, and health risks associated with exposure to various toxic substances.
		1.C1.6.3	Describe the principles of radiation, reproductive, and genetic toxicology.
		1.C1.6.4	Define the role and principles of forensic toxicology in the investigation of poisoning cases, including types of biological samples used, methods of detection, and legal implications.

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
2-2-1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/ natural pharmaceutical materials.	2.C2.1.1	Use laboratory tools to detect toxic agents and interpret analytical results in a forensic context.
2-2-3	Recognize the principles of various tools and instruments and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.	2.C2.8.1	Demonstrate appropriate methods for the analysis of poisons.
2-3-1	Handle, identify, and dispose of biologicals, synthetic/natural materials, biotechnology-based and radio-labeled products, and other materials/product used in the pharmaceutical field.	2.C3.1.1	Handle and dispose of chemicals safely
2-3-2	Recognize and adopt ethical, legal, and safety guidelines for handling and disposal of biologicals, and pharmaceutical materials/products.	2.C3.2.1	Apply GLP guidelines for safe handling and disposal of pharmaceutical materials and products.
2-4-1	Ensure safe handling/ use of poisons to avoid their harm to individuals and communities.	2.C4.1.1	Demonstrate the ability to advise patients and healthcare professionals on the safe handling, use, and potential risks of medicines and poisons and management of toxicity.
2-4-4	Assess toxicity profiles of different xenobiotics and detect poisons in biological specimens.	2.C4.4.1	Interpret toxicological data to assess the severity and mechanism of toxicity.
		2.C4.5.1	Evaluate the toxic effects of substances using biological samples and laboratory techniques.
3-2-4	Provide information about toxic profiles of drugs and other xenobiotics including sources, identification, symptoms, and management control.	3.C2.5.1	Educate patients and the community about toxic profiles of drugs and other toxic substances, e.g. metals, animal and food poisons, pesticides, and radiation.
3-2-6	Maintain public awareness on social health hazards of drug misuse and abuse.	3.C2.7.1	Advise patients and healthcare providers on the safe use and risks of drugs.

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	Demonstrate effective IT and presentation skills.

4. Teaching and Learning Methods

1. Lectures (data show, board)
2. Practical sessions
3. Interactive learning (open discussion)
4. Self- Learning (activity and presentations)
5. 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 - Introduction to Toxicology - Mechanisms of cellular injury Practical General lab safety guidelines Handle and dispose of chemicals safely	3	2	1	-	-
2	Lecture - Animal poisons - Food poisoning Practical Introduction to management of toxicity	3	2	1	-	-

3	Lecture Target organ toxicity: - Blood - Immune system - Nervous system Practical Tissue spots	3	2	1	-	-
4	Lecture Target organ toxicity: - Visual system - Liver - Kidney Formative assessment (quiz 1) Practical Blood spots	3	2	1	-	-
5	Lecture Target organ toxicity: - Respiratory system - Cardiovascular system Practical Case studies (1): Blood & Immune system Respiratory & visual system	3	2	1	-	-
6	Lecture - Toxic Effects of Radiation - Ecotoxicology - Genetic toxicology Practical Case studies (2): Nervous & cardiovascular system Liver & kidney	3	2	1	-	-
7	Midterm exam					
8	Lecture - Toxic effects of metals Practical Forensic toxicology (paracetamol, imipramine, salicylate, nicotine, ethanol, methanol, acetone, quinine)	3	2	1	-	-
9	Lecture - Prevention and treatment of poisoning (Part I) Practical Forensic toxicology (chemical tests of paracetamol, imipramine, salicylate,	3	2	1	-	-

	nicotine, ethanol, methanol, acetone, quinine)					
10	Lecture - Prevention and treatment of poisoning (Part II) Formative assessment (quiz 2) Practical Case studies (3): Metals – Gases.	3	2	1	-	-
11	Lecture - Forensic chemistry of biological stains and hair Practical Case studies (4): Animal, plant and marine poisons – Pesticides	3	2	1	-	-
12	Lecture Toxic effects of pesticides Practical Activity 1 (PowerPoint presentation of case study)	3	2	1	-	-
13	Lecture Drug abuse Practical Practical exam	3	2	1	-	-
14	Lecture Revision and open discussion Practical Activity 2 (PowerPoint presentation of case study)	3	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 13	25	25%

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

7. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	- Student book of “Basic and clinical toxicology” approved by the pharmacology and toxicology department 2025-2026. - Practical notes approved by the pharmacology and toxicology department 2025-2026.
	Other References	1. Casarett & Doull’s TOXICOLOGY THE BASIC SCIENCE OF POISONS, Ninth Edition, Curtis D. Klaassen, McGraw-Hill Education (2019) 2. Lu’s Basic Toxicology: Fundamentals, Target Organs, and Risk Assessment, Seventh Edition, Byung-Mu Lee, Sam Kacew, Hyung Sik Kim, Taylor & Francis Group (2018). 3. The Toxicologist’s Pocket Handbook, Third Edition, Michael J. Derelanko, Taylor & Francis Group (2018).
	Electronic Sources (Links must be added)	- Annual Review of Pharmacology and Toxicology https://www.annualreviews.org/content/journals/pharmtox - EKB (https://www.ekb.eg/en/web/researchers/home) - PubMed (https://pubmed.ncbi.nlm.nih.gov/) - ScienceDirect (https://www.sciencedirect.com/)
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for 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, air-conditioned classroom
	Supplies	-
	Electronic Programs	1. Microsoft office 2. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator
Prof. Dr. Salah A. Ghareib

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

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

**Pharmacotherapy of
Neuropsychiatric Diseases**

PP 907

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1 Basic Information

Course Title (according to the bylaw)	Pharmacotherapy of Neuropsychiatric Diseases			
Course Code (according to the bylaw)	PP 907			
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 hr/week	1 hr/week	-	2 hrs/week
Course Type	Faculty Requirements اجباري			
Academic level at which the course is taught	Fifth level –Semester 9			
Academic Program	Bachelor of Pharmacy (Pharm D -Clinical Pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr Prof. Dr. Bothina Mohamed			
Course Specification Approval Date	25/8/2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Quality assurance unit Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, students will be able to define the principles of pharmacotherapy in neuropsychiatric disorders, including the pharmacologic basis of treatment, therapeutic drug monitoring, and mechanisms of drug action and metabolism in the central nervous system. Students will be able to apply Pharmacotherapeutic strategies in the clinical management of psychiatric and neurologic conditions such as depression, schizophrenia, bipolar disorder, epilepsy, and Parkinson's disease. Emphasis will be placed on individualized drug therapy, especially for medications with a narrow therapeutic index such as lithium, valproate, carbamazepine, and antipsychotics.

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.C1.7.1.	Describe the principles of pharmacotherapy and clinical pharmacy as applied to neuropsychiatric diseases.
1-1-2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8.1.	Recognize and accurately use standard medical and pharmaceutical terminology, abbreviations, and symbols relevant to the pharmacotherapy of neuropsychiatric disorders.
1-1-4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations	1.C1.11.1	Apply pharmacological and pharmacotherapeutic principles in the proper selection of drugs for the management of different neuropsychiatric diseases.
		1.C1.12.1	Assess the suitability of pharmacological treatments for neuropsychiatric disorders based on disease etiology, pathophysiology, severity, patient-specific factors including medical history, potential

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
			drug interactions, and age-related considerations.
1-1-6	Utilize scientific literature, and collect and interpret information to enhance professional decision	1.C1.16.1	Collect and interpret patient-specific data to provide evidence-based recommendations to prescribers regarding the selection and dosing of medications used in the management of neuropsychiatric conditions.
2-4-1	Ensure safe handling/ use of poisons to avoid their harm to individuals and communities	2.C4.1.1	Provide appropriate counseling to patients and healthcare professionals regarding the safe, effective, and individualized use of neuropsychiatric medications, including monitoring for adverse effects, toxicity, and drug interactions.
3-1-3	Monitor and control microbial growth and carry out laboratory tests for identification of infections/ diseases.	3.C1.5.1	Identify the appropriate level of monitoring needed for patients receiving neuropsychiatric medications, considering potential drug-related problems and the nature of the underlying neurological or psychiatric disorder.
3-1-4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.6.1	Develop therapeutic plans for neuropsychiatric conditions based on its etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infection/ disease.
		3.C1.7.1	Evaluate neuropsychiatric drug therapy based on the patient's progress and laboratory results.

4 Teaching and Learning Methods

Lectures (data show, board)

Practical sessions

Problem solving (Practical)

Self- learning (Activity)

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 ➤ Introduction to neuropsychiatric diseases (Pharmacology principles of neurological disorders)	1	1	-	-	-
	Practical session -Pharmacology principles of neurological disorders	1	-	1	-	-
2	Lecture ➤ Introduction to neuropsychiatric diseases (Pharmacology principles of psychological disorders)	1	1	-	-	-
	Practical session -Pharmacology principles of psychological disorders	1	-	1	-	-
3	Lecture ➤ Introduction of Substance Use Disorders (SUD): • Definitions of opioid Use Disorder • Diagnostic criteria • Symptoms & drugs used in treatment of intoxication and withdrawal • Maintenance treatment	1	1	-	-	-
	Practical session Opioid Use Disorder	1	-	1	-	-
4	Lecture ➤ Alcohol Use Disorder • Symptoms & drugs used in treatment of intoxication and withdrawal	1	1	-	-	-

	Treatment preventing Relapse					
	Formative assessment (quiz1)					
	Practical session Alcohol Use Disorder	1	-	1	-	-
5	Lecture ➤ Tobacco Use Disorder Symptoms & drugs approved in treatment of intoxication and withdrawal	1	1	-	-	-
	Practical session Tobacco use Disorder	1	-	1	-	-
6	Lecture ➤ Cannabis Use Disorder Symptoms & drugs approved in the treatment of intoxication and withdrawal	1	1	-	-	-
	Practical session Cannabis Use Disorder	1	-	1	-	-
7	Lecture ➤ Epilepsy Part 1	1	1	-	-	-
	Practical session Epilepsy	1	-	1	-	-
8	Midterm exam					
9	Lecture ➤ Headache (migraine) & Anxiety	1	1	-	-	-
	Practical session Headache (migraine) & Anxiety	1	-	1	-	-
10	Lecture ➤ Parkinson's & Alzheimer's disorders	1	1	-	-	-
	Formative assessment (quiz 2) Practical session Dementia and Alzheimer's disorders	1	-	1	_*	-

11	Lecture ➤ Schizophrenia	1	1	-	-	-
	Practical session Schizophrenia	1	-	1	-	-
12	Lecture ➤ Epilepsy Part 2 Formative assessment (quiz 3)	1	1	-	-	-
	Practical session Bipolar disorders & Depression	1	-	1	-	-
13	Lecture ➤ Bipolar disorders & Depression	1	1	-	-	-
	Practical exam + Activity submission	-	-	-	-	-
14	Lecture ➤ General discussion and revision	1	1	-	-	-
	Practical session Discussion and Assessment of activity	1	-	1	_*	-
15	Final written exam					

* As part of a self-learning activity in Pharmacotherapy of Neuropsychiatric Diseases 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 14 were facilitated for students to present their reports on the various activity self-learning topics according to the announced student distribution on topics. Supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

6 Methods of students' assessment

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

4	Final <u>Practical</u> /Clinical/... Exam	Weeks 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 4,10,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of “Pharmacotherapy of Neuropsychiatric Diseases “
	Other References	- Kaplan & Sadock’s synopsis of psychiatry / editors, Robert Joseph Boland, Marcia L. Verduin; consulting editor, Pedro Ruiz; editorial assistant, Arya Shah. 12th edition (2022). - Stahl’s Essential Psychopharmacology Neuroscientific Basis and Practical Applications. Stephen M. Stahl Fifth Edition (2021). - DiPiro, J. T., Yee, G. C., Posey, L. M., Haines, S. T., Nolin, T. D., & Ellingrod, V. (2023). Pharmacotherapy: A pathophysiologic approach (12th ed.). McGraw-Hill Education.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ https://accessmedicine.mhmedical.com/book.aspx?bookID=3191 www.Pubmed.Com and www.sciencedirect.com https://accesspharmacy.mhmedical.com/book.aspx?bookID=3097
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy-</u>	https://shorturl.at/sar8D

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

**Name and Signature
Course Coordinator**

Prof. Dr. Bothina Mohamed

**Name and Signature
Head of Department**

Ass.Prof.Dr. Esraa Zakaria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Biotechnology and Molecular

Biology

PM 906

Fifth level –Semester 9

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Biotechnology and Molecular Biology			
Course Code (according to the bylaw)	PM 906			
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 hrs/week	1 hr/week	---	3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 5 - Semester 9			
Academic Program	Bachelor of Pharmacy-Pharm D (Clinical Pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Fathy ElSayed Serry			
Course Specification Approval Date	18/8/2025			
Course Specification Approval	Department Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, the students will be able to identify the basic principles of microbial biotechnology and fermentation and their applications. They will understand gene cloning and recombinant DNA technology techniques and their applications. They can use biotechnology for production of essential bioproducts such as vitamins, antibiotics and vaccines. In addition, they will understand the applications of molecular techniques for production of recombinant-DNA products and nucleic acid based therapies and other major biotechnological products.

3. Course Learning Outcomes CLOs

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

Program Outcomes (NARS) (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	Identify the basic principles of microbial biotechnology and fermentation
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	1.C1.8.1	Use the proper terms of biotechnology and molecular biology
2.3.1	Handle, identify and dispose biotechnology-based and radio-labeled products and other materials used in pharmaceutical field.	2.C3.1.1	Handle basic laboratory equipment, chemicals and biohazards 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 biotransformation, gene cloning and recombinant DNA technology
4.2.2	Use contemporary technologies and media to demonstrate effective presentation skills	4.C2.3.1	Acquire good information technology skills as well as presentation skills

4. Teaching and Learning Methods

Lectures

Practical sessions

Self- Learning (Activity)*

Co-operative learning (Activity)*

*The activity consists of student presentations on specific topics, combining self-learning and co-operative learning, as students work together in teams to prepare and deliver their presentations during practical sessions.

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/ Assignments / Projects/ ...)	Other (to be determined)
1	➤ Lecture: Introduction to Microbial biotechnology and fermentation.	2	2	-	-	-
	➤ Practical session: Fermentation media.	2	-	1	-	-
2	➤ Lecture: -Fermentation system - Upstream and downstream processing	2	2	-	-	-
	➤ Practical session: Industrial fermentation and production of citric acid.	2	-	1	-	-
3	➤ Lecture: Production of primary metabolites → alcohol, organic acids, amino acids and polysaccharides.	2	2	-	-	-
	➤ Practical session: Production of penicillin by fermentation	2	-	1	-	-
4	➤ Lecture: -Production of secondary metabolites → antibiotics, vitamins, insecticides -Production of microbial enzymes. ➤ Formative assessment (quiz 1)	2	2	-	-	-
	➤ Practical session Production of vitamin B12 by fermentation	2	-	1	-	-
5	➤ Lecture -Biotransformation. -Production of microbial biomass. -Production of immunological products and their quality control. -Production of bacterial and viral vaccines.	2	2	-	-	-
	➤ Practical session DNA extraction	2	-	1	-	-

6	➤ Lecture Production of Monoclonal antibodies, their types and applications	2	2	-	-	-
	➤ Practical session Electrophoresis → agarose gel electrophoresis, polyacrylamide-Gel electrophoresis	2	-	1	-	-
7	➤ Lecture: ▪ Steps of Gene cloning & recombinant DNA(rDNA)	2	2	-	-	-
	➤ Practical session: Polymerase chain reaction	2	-	1	-	-
8	Periodical exam					
9	➤ Lecture: Molecular biology techniques ▪ PCR ▪ DNA Microarray ▪ DNA sequencing	2	2	-	-	-
	➤ Practical session: Gene cloning	2	-	1	-	-
10	➤ Lecture: ▪ Types of expression vectors and Expression systems.	2	2	-	-	-
	➤ Practical session: Orientation on Activity	2	-	1	_*	-
11	➤ Lecture: ▪ Applications of rDNA in pharmaceutical & medical fields ▪ Applications rDNA technology in other Fields → e.g. Microbial insecticides and biocontrol Formative assessment (quiz 2)	2	2	-	-	-
	➤ Practical revision and open discussion.	2	-	1	-	-
12	➤ Lecture: ▪ Gene Therapy ▪ Nucleic acid-based therapy	2	2	-	-	-
	➤ Practical exam	2	-	1	-	-
13	➤ Lecture: ▪ Stem cells and regenerative medicine. Formative assessment (quiz 3)	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					

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

6. Methods of students' assessment

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

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 "Notes in Biotechnology and Molecular Biology" approved by Microbiology & Immunology department (2025-2026) • Practical book of Biotechnology and Molecular Biology" approved by Microbiology & Immunology department (2025-2026)
	Other References	1- Benz, J. P., & Schipper, K. (Eds.). (2020). Genetics and biotechnology (Vol. 2). Springer Nature. 2- Fatima, G., Magomedova, A., & Parvez, S. (2024). Biotechnology and sustainable development. Shineeks Publishers. 3- Glick, B. R., & Patten, C. L. (2022). Molecular biotechnology: principles and applications of recombinant DNA. John Wiley & Sons. 4- Masoodi, K. Z., Lone, S. M., & Rasool, R. S. (2020). Advanced methods in molecular biology and biotechnology: a practical lab manual. Academic Press. 5- Najafpour, G. (2025). Biochemical engineering and biotechnology. Elsevier.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com www.sciencedirect.com https://www.wiley.com/ https://www.springernature.com/gp
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagazig University for students</u>	https://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin

Supportive facilities & equipment for teaching and learning	Devices/Instruments	• For lectures: whiteboard, data show and computer. • For Labs: Autoclaves, Incubators, Ovens, fermenters, microscopes, refrigerators.
	Supplies	Chemicals, plates and microbiological culture media.
	Electronic Programs	3. Microsoft office 4. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	Videos

Name and Signature
Course Coordinator
Prof. Dr. Fathy ElSayed Serry

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

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

**Pharmacotherapy of Dermatological,
Reproductive & Musculoskeletal
disease**

PP 908

Fifth level –Semester 9

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacotherapy of Dermatological, Reproductive & Musculoskeletal disease			
Course Code (according to the bylaw)	PP 908			
Department/s participating in delivery of the course	Pharmacy Practice Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical 1 2hrs/week	Practical 1 hr/week	Other (specify) ---	Total 3hr/week
Course Type	Faculty requirement			
Academic level at which the course is taught	Level 5 -Semester 9			
Academic Program	Bachelor of Pharmacy (Pharm D -Clinical Pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	zagazig university			
Name of Course Coordinator	Dr. Mona Abdullah			
Course Specification Approval Date	8/25/2025			
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)

On completion of the course, students will be able to Identify the etiology, clinical picture & treatment of common skin, rheumatological, and reproductive 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.C1.7.1	Describe the principles of pharmacotherapy of different skin and rheumatological disease.
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice.	1.C1.8.1.	Use the proper pharmaceutical, medical terms, abbreviations and symbols in relation to dermatological, rheumatological, and reproductive disease.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.11.1.	Apply pharmacological and pharmacotherapeutic principles in the proper <u>selection</u> of drugs for the management of skin, rheumatological, and reproductive diseases.
		1.C1.12.1.	Assess the appropriateness of medicines for common skin, reproductive, and rheumatological diseases based on aetiology, pathophysiology, severity, patient medical history, possible interactions and age-related factors.
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.C1.2.1.	Collaborate with dermatologists and rheumatologists to optimize the use of medication and promote health.
3.1.3	Monitor and control microbial growth and carry out laboratory	3.C1.5.1.	Identify the degree of monitoring required for a patient according to the health risks posed by the patient's medication, drug related

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
	tests for identification of infections/diseases.		problem, or dermatological, reproductive and rheumatological disease.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.6.1.	Develop therapeutic plans for common dermatological, reproductive, and rheumatological diseases based on their etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features.
		3.C1.7.1.	Evaluate the appropriateness and effectiveness of selected drug therapy for dermatological, reproductive, and rheumatological disease based on the patient's progress and laboratory results.
4.1.2.	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Develop problem solving skills including problem identification and design of management plan in collaboration with dermatologists and rheumatologists

4. Teaching and Learning Methods

Lectures (data show, board)

Practical sessions

Problem solving/ Case study (Practical)

Self- learning (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical /Clinical/))	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Lecture Skin structure & lesions Bacterial skin diseases Mycobacterial diseases	2	2	-	-	-
	Practical session Case study on Lec1	2	-	1	-	-
2	Lecture Fungal skin diseases Acne Miliaria	2	2	-	-	-
	Practical session Case study on Lec 2	2	-	1	-	-
3	Lecture Viral skin diseases Parasitic skin diseases	2	2	-	-	-
	Practical session Case study on Lec3	2	-	1	-	-
4	Lecture Joint structure Types of arthritis Degenerative arthritis Formative assessment (quiz1)	2	2	-	-	-
	Practical session Case study on Lec 4	2	-	1	-	-
5	Lecture Rheumatoid arthritis (RA)	2	2	-	-	-
	Practical session Case study on Lec 5	2	-	1	-	-
6	Lecture Mechanical & inflammatory low back pain	2	2	-	-	-

	Practical session Case study on Lec 6	2	-	1	-	-
7	Periodical Exam					
8	Lecture Eczema Urticaria Reactive erythema	2	2	-	-	-
	Practical session Case study on Lec 8	2	-	1	-	-
9	Lecture Papulosquamous -LE, vitiligo Alopecia, Melasma	2	2	-	-	-
	Practical session Case study on Lec 9	2	-	1	-	-
10	Lecture Urogenital discharge, HIV - Genital ulcers, ED, infertility Formative assessment (quiz2)	2	2	-	-	-
	Practical session Case study on Lec 10	2	-	1	-	-
11	Lecture Crystal induced arthritis and septic arthritis	2	2	-	-	-
	Practical session Case study on Lec 11	2	-	1	-	-
12	Lecture - Systemic lupus erythematosus - Systemic sclerosis Formative assessment (quiz3)	2	2	-	-	-
	Practical session Case study on Lec 12	2	-	1	-	-
13	Lecture - Osteoporosis	2	2	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture General discussion and revision	2	2	-	-	-
	Activity	2	-	1	*_-	-

15	Final written exam
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*Students were assigned an activity based on a case study, requiring them to apply knowledge from the course and supplement it with reputable online resources, ensuring alignment with evidence-based guidelines and actual clinical practice.

1. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1 written (<u>Periodical Exam</u>)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final <u>Practical</u> /Clinical/... Exam	Weeks 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Project (<u>Self-learning Activity</u>)	Weeks 14	5	5%
7	Assignment (<u>Formative assessment</u>)	Weeks 4,10,12	-	-
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's Handout "Dermatology, Venereology & Andrology" & "Rheumatology" For Clinical Pharmacy Students. - Practical notes.
	Other References	1. DiPiro, J. T., Yee, G. C., Posey, L. M., Haines, S. T., Nolin, T. D., Ellingrod, V. L. (2023). <i>Pharmacotherapy: A Pathophysiologic Approach</i>

		(13th ed.). New York, NY: McGraw-Hill Education. 2. Kang, S., Amagai, M., Bruckner, A. L., Enk, A. H., Margolis, D. J., McMichael, A. J., & Orringer, J. S. (2024). <i>Fitzpatrick's Dermatology</i> (10th ed.). New York, NY: McGraw-Hill Education. 3. Watts, R., Conaghan, P. G., Denton, C., Isaacs, J., Lanyon, P., & Mukhtyar, C. (Eds.). (2023). <i>Oxford Textbook of Rheumatology</i> (5th ed.). Oxford, UK: Oxford University Press.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com and www.sciencedirect.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, Multimedia projector, board
	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**

Dr. Mona Abdullah

**Name and Signature
Head of Department**

Ass.Prof.Dr. Esraa Zakaria

COURSE SPECIFICATIONS

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

Medicinal Chemistry III

PC 903

Fifth level –Semester 9

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Medicinal Chemistry III			
Course Code (according to the bylaw)	PC 903			
Department/s participating in delivery of the course	Medicinal chemistry 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 5- semester 9			
Academic Program	Bachelor of Pharmacy - Pharm D- Clinical Pharmacy			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Assist. Prof. Dr. Samar Said Elbaramawi			
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 study various medicinal chemistry aspects of drugs acting on metabolic and endocrine disorders, as well as related agents. The following topics will be addressed: non-steroidal anti-inflammatory drugs, opioid analgesics, local anesthetics, antiallergic agents, hormones and related agents, antidiabetic agents and antiulcer agents.

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	Identify the chemistry and physicochemical properties of different drug classes (hormones, antidiabetic agents, antiallergic, anti-ulcers agents, non-steroidal anti-inflammatory drugs, opioid analgesics and local anesthetic).
1-1-3	Integrate knowledge from fundamental sciences to handle, identify, extract, design, prepare, analyze, and assure quality of synthetic/ natural pharmaceutical materials/products.	1.C1.9.1	Describe suitable methods of synthesis and assay some of different drug classes (hormones, antidiabetic agents, antiallergic, anti-ulcers agents, non-steroidal anti-inflammatory drugs, opioid analgesics and local anesthetic).
1-1-4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.10.1	Recognize mode of action & SAR of different drug classes (hormones, antidiabetic agents, antiallergic, anti-ulcers agents, non-steroidal anti-inflammatory drugs, opioid analgesics and local anesthetic).

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
2-2-1	Isolate, design, identify, synthesize, purify, analyze, and standardize synthetic/ natural pharmaceutical materials.	2.C2.1.1	Design different synthetic compounds and chemical pathways.
2-2-3	Recognize the principles of various tools and instruments, and select the proper techniques for synthesis and analysis of different materials and production of pharmaceuticals.	2.C2.8.1	Implement the appropriate methods for assay of different authentic samples and pharmaceutical preparations.
2-2-4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.	2.C2.11.1	Apply principles of bio-informatics and computer-aided tools.
		2.C2.12.1	Calculate the concentration of different authentic and pharmaceutical samples.
2-3-1	Handle, identify, and dispose biologicals, synthetic/natural materials, biotechnology-based and radiolabelled products, and other materials/products used in pharmaceutical field.	2.C3.1.1	Handle chemicals, solvents, and hazardous products properly.
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 in handling pharmaceutical preparations & laboratory equipment.
4-1-2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Applies critical thinking and team-based decision-making skills to collaboratively solve complex problems and analyze in a structured, solution-oriented manner.
4-2-2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Design a case study for students on synthetic pathways using ChemDraw, integrating visual tools to enhance understanding of reaction mechanisms and structural design.

4. Teaching and Learning Methods

Lectures (data show, board)

Practical sessions

Simulation-based learning (Practical, Activity)

Self-learning (Activity)

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 Non-steroidal anti-inflammatory agents -Introduction about inflammation and prostaglandins -Salicylates and P-Aminophenol's -Anthranilic acid derivatives -Aryl acetic derivatives	2	2	-	-	-
	Practical session ChemDraw ▪ Main ChemDraw Interface ▪ Chemical Structure Drawing ▪ Atom Labeling, Numbering, Captions ▪ Color, Rotation & Frame Addition ▪ Finishing Up Structure ▪ Document Settings	2	-	1	-	-
2	Lecture - Propionic acid derivatives -Oxicams -COX-II Inhibitors -Antigout drugs	2	2	-	-	-
	Practical session ChemDraw ▪ Conversion of Structure to Name or Smiles & Vice Versa ▪ Copy, Paste & Align Objects	2	-	1	-	-
3	Lecture Opioid analgesics -Morphine and semisynthetic antilogs	2	2	-	-	-
	Practical session ▪ Simple Chemical Reaction Drawing ▪ Finishing Up the Reaction ▪ Chemical Pathway Drawing	2	-	1	-	-
4	Lecture Narcotic antagonists -Synthetic narcotic analgesics -The most recent synthetic narcotic analgesic	2	2	-	-	-

	Formative assessment (quiz1)					
	Practical session ChemDraw ▪ ¹ H & ¹³ CNMR Prediction ▪ Analysis Window	2	-	1	-	-
5	Lecture Local anesthetic drugs.	2	2	-	-	-
	Practical session ChemDraw ▪ Chemical Properties Window ▪ Application	2	-	1	-	-
6	Lecture - Antiallergenic agents (H1-antihistaminics) -First generation antihistaminic -Second generation antihistaminic - Third generation antihistaminic	2	2	-	-	-
	Practical session Introduction to Spectrophotometry	2	-	1	-	-
7	Midterm exam					
8	Lecture Hormones and related agents -Types of Hormones -Nomenclature of steroids - Estrogenic & anti-estrogenic agents -Aromatase inhibitor	2	2	-	-	-
	Practical session Determination of λ max	2	-	1	-	-
9	Lecture - Female sex hormones & oral contraceptives -Androgens& anti-androgenic agents	2	2	-	-	-
	Practical session Colorimetric assay of Dexamethasone [®] ampoule	2	-	1	-	-
10	Lecture -Anabolic Agents -Mineralocorticoids and glucocorticoids	2	2	-	-	-

	Practical session Colorimetric assay of Sodium Salicylate - Orientation on Activity	2	-	1	_*	-
11	Lecture Oral antidiabetic drugs - First and second-generation sulfonyl urea derivative -No sulfonylurea derivative -Thiazolidindiones	2	2	-	-	-
	Practical exam	2	-	1	-	-
12	Lecture - Dipeptidyl peptidase inhibitors Alpha-glucosidase inhibitors - Glucagon-like peptide -1 agonist. -Sodium Glucose co-transporter-2 inhibitors Formative assessment (quiz 2)	2	2	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture Antiulcer Drugs -H ₂ -antagonists -Proton pump inhibitors -Potassium competitive acid blockers. -Chemical complexation -Prostaglandins antilogs	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					

* As part of a self-learning activity in medicinal 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 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.

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	Weeks 11 and 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 4,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes of "Medicinal Chemistry III" approved by the medicinal chemistry department 2025-2026.
	Other References	- Wilson CO, Gisvold O, Delgado JN, Remers WA. Wilson and Gisvold's textbook of organic medicinal and pharmaceutical chemistry. 12th ed. Philadelphia: Lippincott-Raven; 2011. - Roche VF, Zito SW, Lemke TL, Williams DA, Foye WO. Foye's principles of medicinal chemistry. 8th ed. Philadelphia: Wolters Kluwer Health; 2019. - British Pharmacopoeia Commission. British Pharmacopoeia. London: The Stationery Office; 1988–2024. United States Pharmacopeial Convention. - United States Pharmacopoeia and National Formulary (USP–NF). Rockville (MD): United States Pharmacopeial Convention; 1988–2024. - Patrick GL. An Introduction to Medicinal Chemistry. 7th ed. Oxford: Oxford University Press; 2023
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com and

		www.sciencedirect.com http://journals.tubitak.gov.tr/chem/index.php http://www.pharmacopoeia.co.uk/
	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, Spectrophotometer
	Supplies	Chemicals and Glassware
	Electronic Programs	5. Microsoft office 6. Microsoft teams 7. Chem Draw Application (Free trial version)
	Skill Labs/ Simulators	-
	Virtual Labs	Computer labs
	Other (to be mentioned)	-

Name and Signature
Course Coordinator

Assist. Prof. Samar Elbaramawi

Name and Signature
Head of Department

Prof. Dr. Hend Kothayer

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Marketing &

Pharmacoeconomics

NP 905

Fifth level –Semester 9

Course Specification

(2025/2026)

1. Basic Information

Course Title (according to the bylaw)	Marketing & Pharmacoeconomics			
Course Code (according to the bylaw)	NP 905			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1	-	-	1
Course Type	Minor			
Academic level at which the course is taught	5 th level (9th semester)			
Academic Program	Bachelor of Pharmacy (Pharm D-Clinical Pharmacy)			
Faculty/Institute	Faculty of Pharmacy			
Name of Course Coordinator	Prof. Dr. Emad Kamhawi			
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)

The course aims to provide students with a comprehensive understanding of marketing principles and pharmacoeconomic evaluation within pharmaceutical and healthcare contexts. It introduces the fundamentals of market segmentation, targeting, and the marketing mix (product, price, place, and promotion), while emphasizing their application in institutional and community pharmacy settings. In parallel, the course equips students with the knowledge and skills to apply pharmacoeconomic assessment methods, including cost-effectiveness and cost-benefit analysis, to support evidence-based decision-making. By integrating marketing strategies with economic evaluation and professional ethics, the course prepares students to design, implement, and evaluate customized marketing plans that enhance patient care, organizational efficiency, and the sustainable use of healthcare resources.

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	Explain the role of marketing within administrative sciences
		1.C1.5.2	Analyze market segmentation, targeting, and positioning strategies relevant to pharmaceuticals

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
2-6-1	Apply the principles of business administration and management to ensure rational use of financial and human re-sources	2.C6.1.1	Understand the principles of marketing and pharmacoeconomics as essential components of effective organization and management in the pharmaceutical field.
2-6-2	Utilize the principles of drug promotion, sales, marketing, accounting, and pharmacoeconomic analysis.	2.C6.4.1	Apply fundamental principles of drug promotion, sales, and marketing within the pharmaceutical industry.
		2.C6.5.1	Design marketing plans tailored to the specific pharmaceutical setting, customer needs, and healthcare market.
		2.C6.6.1	Integrate the principles of pharmacoeconomic evaluation to critically assess and compare the cost–benefit and value of medicines.
4-2-2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Demonstrate effective oral and visual presentation skills, tailored to academic, professional, or policy audiences.

4. Teaching and Learning Methods

Lectures

Blended-learning (internet search as 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	What Is Marketing? Understand the Marketplace and Customer Needs	1	1	--	-	-
2	Designing a Customer-Driven Marketing Strategy Preparing an Integrated Marketing Plan and Program	1	1	---	-	-
3	Building Customer Relationships Capturing Value from Customers	1	1	--	-	-
4	The Changing Marketing Landscape	1	1	--	-	-
5	Model of Consumer Behavior Characteristics Affecting Consumer Behavior Types of Buying Decision Behavior	1	1	--	-	-
6	The Buyer Decision Process The Buyer Decision Process for New Products Activity 1	1	1	--	-	-
7	Midterm exam					
8	Product Policy & Branding Pricing & Customer Value	1	1	--	-	-
9	Distribution Networks & Place Value Marketing Communication & Promotion	1	1	--	-	-
10	Segmentation Targeting Activity 2	1	1	--	-	-
11	Target Customers	1	1	--	-	-
12	Product Life Cycle	1	1	--	-	-
13	Pharmacoeconomics	1	1	--	-	-
14	Final revision	1	1	--	-	-
15	Written exam				-	-

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (mid-term exam)	Week 7	15	15%
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)	6,10	10	10%
7	Field training	-	-	-
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 Marketing & Pharmacoeconomics
	Other References	1. Kotler, P., & Keller, K. L. (16th edition). Marketing Management. Pearson. Xiong, J. (2006). Essential bioinformatics. Cambridge University Press. 2. Shah, B., & Chitnis, K. (2019). Pharmaceutical Marketing: Principles, Environment, and Practice. PharmaMed Press. 3. Drummond, M. F., Sculpher, M. J., Claxton, K., Stoddart, G. L., & Torrance, G. W. (2015). Methods for the Economic Evaluation of Health Care Programmes (4th ed.). Oxford University Press. 4. Kotler, P., Shalowitz, J., & Stevens, R. J. (2011). Strategic Marketing for Health Care Organizations: Building a Customer-Driven Health System. Jossey-Bass.

	Electronic Sources (Links must be added)	1- <u>ISPOR – International Society for Pharmacoeconomics and Outcomes Research</u> 2- <u>World Health Organization (WHO) – Essential Medicines & Pharmaceutical Policy</u> <u>https://www.who.int/medicines</u> 3- <u>www.ekb.eg</u> 4- <u>www.Pubmed.com</u> 5- <u>www.sciencedirect.com</u>
	Learning Platforms (Links must be added)	
	Other (to be mentioned)	
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer / Data show
	Supplies	White/black board
	Electronic Programs	
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

**Name and Signature
Course Coordinator**

Prof. Dr. Emad Kamhawi

**Name and Signature
Head of Department**

Ass.Prof.Dr. Esraa Zakaria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Entrepreneurship

UR 906

Fifth level –Semester 9

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Entrepreneurship			
Course Code (according to the bylaw)	UR 906			
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
	1hr/week	-	-	1hr/week
Course Type	University requirement			
Academic level at which the course is taught	Level five/Semester nine			
Academic Program	Bachelor of Pharmacy (Pharm D-Clinical Pharmacy)			
Faculty/Institute	Pharmacy			
University/Academy	Zagazig			
Name of Course Coordinator	Prof. Dr. Emad Kamhawi			
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)

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

- 1- Develop products, services, or innovations that generate income and contribute to the economy through job creation, investment, and GDP growth.
- 2- Identify market gaps and unmet needs, then create solutions—products or services—that improve people’s lives or solve real-world problems.

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	Identify basics of entrepreneurship and define different terminologies related to entrepreneurship.
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, evaluation and decision-making processes and teamwork.
		2.C6.2.1	Show proficiency in analyzing and handling financial data and budget information efficiently.
4-1-1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills	4.C1.3.1	Exhibit the ability to organize priorities, allocate resources efficiently, and implement effective work plans to achieve goals within set timelines.
4-1-2	Retrieve and critically analyze information, identify and solve problems, and	4.C1.5.1	Demonstrate the ability to identify healthcare-related problems, analyze

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
	work autonomously and effectively in a team.		possible solutions, and develop coordinated management plans through effective collaboration with healthcare professionals.
4-1-3	Demonstrate creativity and apply entrepreneurial skills within a simulated entrepreneurial activity.	4.C1.7.1	Apply innovative thinking and entrepreneurial abilities.

4. Teaching and Learning Methods

- Lectures
- Self-learning (Activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/)	Self-learning (Tasks/Assignments/Projects/ ...)	Other (to be determined)
1	Introduction to entrepreneurship (benefits-drawbacks)	1	1	-	-	
2	Diversity and statistics of small business Mistakes and avoiding pitfalls of small business	1	1	-	-	
3	Business models (Derek Abel, Peter Drucker and Clayton Christensen) - Formative assessment	1	1	-	-	
4	Business models (Haung's two tiers, St. Gallen, Michael Morris et al and Shikar Gosh)	1	1	-	-	
5	Feasibility Analysis - Formative assessment	1	1	-	-	
6	Business Plan	1	1	-	-	
7	Midterm					
8	Business opportunities for pharmacists	1	1	-	-	
9	Strategic management process (introduction)	1	1	-	-	
10	Environmental analysis	1	1	-	-	

11	Strategy formulation	1	1	-	-	
12	Strategy implementation Strategy evaluation and control	1	1	-	-	
13	assignments assessment	1	1	-	-	
14	-Revision	1	1	-	-	
15	Final exam					

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 1written (Midterm exam)	7	20	20%
2	Exam 2..... (semester work)	-	-	-
3	Final Written Exam	15	75	75%
4	Final Practical /Clinical/... Exam	-	-	-
5	Final Oral Exam	-	-	-
6	Project (Self learning activity)	13	5	5%
7	Assignments (Formative assessment)	3,5	-	-
8	Others	-	-	-

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

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Lectures handout
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	Other References	• Entrepreneurship (2020) Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd • The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses (2011) Eric Ries • Innovation and Entrepreneurship (1985) Peter Drucker • Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers (2010) Alexander Osterwalder, Yves Pigneur • Pharmacy Management: Essentials for All Practice Settings (2022) David A. Holdford, Thomas R. Brown • Pharmaceutical Marketing: Principles, Environment, and Practice (2013) Mickey C. Smith, Edward M. Kolassa, Greg Perkins, Bruce Siecker
	Electronic Sources (Links must be added)	www.ekb.eg WWW.pubmed.com
	Learning Platforms (Links must be added)	https://adminph.eps.zu.edu.eg/Views/AdminViews/Login?AspxAutoDetectCookieSupport=1
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer / Data show
	Supplies	White/black board
	Electronic Programs	-
	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. Emad Kamhawi

**Name and Signature
Head of Department**

Ass.Prof.Dr. Esraa Zakaria



وحدة ضمان الجودة



كلية الصيدلة
FACULTY OF PHARMACY

Semester 10

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Pharmacotherapy of critical

care patients

PP 009

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacotherapy of critical care patients			
Course Code (according to the bylaw)	PP 009			
Department/s participating in delivery of the course	Internal medicine- Faculty of Medicine Pharmacy practice, Faculty of pharmacy			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 credit hr/week	1 credit hr/week	-	2 credit hrs/week
Course Type	Faculty requirements			
Academic level at which the course is taught	Level 5- semester 10			
Academic Program	Bachelor of Pharmacy (Pharm D -clinical pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Fayrouz Othman Selim			
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)

On completion of the course, Students will be able to understand the role of the pharmacist in intensive care units, special needs of the patients in these units, guidelines for proper use of drugs in intensive care units and handling of drug problems related to these patients.

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
1-1-4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.11.1	Integrate pharmacological and pharmacotherapeutic principles to manage acute and critical conditions (e.g., hypertension emergency, anaphylaxis, trauma, epilepsy) and describe appropriate use of supportive care: oxygen, nutritional support, analgesia, acid-base management, and anticoagulation
		1.C1.12.1	Evaluate the suitability of drug therapy and recommend drug therapy plans considering severity, drug interactions, comorbidities, and patient-specific factors, and monitor and interpret vital signs, lab values, and hemodynamic parameters to support clinical decisions
1-1-6	Utilize scientific literature, and collect and interpret information to enhance professional decision	1.C1.16.1	Analyze, evaluate, and present drug-related recommendations and apply clinical pharmacy skills to provide evidence-based interventions in ICU/critical care settings
2-4-3	Take actions to solve any identified medicine-related and pharmaceutical care problems.	2.C4.3.1	Recognize and prevent drug-related problems, including adverse effects, contraindications, medication errors, and antimicrobial resistance

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
3-1-4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.7.1	Assess treatment outcomes through monitoring therapy response and making evidence-based adjustments
4-1-1	Demonstrate responsibility for team performance and peer evaluation of other team members, and express time management skills.	4.C1.2.1	Demonstrate effective collaboration with healthcare professionals in evaluating and optimizing patient care plans in the critical care setting.

4. Teaching and Learning Methods

1. Lectures
2. Practical session (case study, role play and problem solving)
3. Class Activity Discussion / Brainstorming
4. Self-learning

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 Cardiovascular critical care: Hypertensive emergencies Shock	1	1	-	-	-
	Practical Vital signs and Mental Status assessment	1	-	2	-	-
2	Lecture Neurological critical care: Stroke (cerebrovascular accident)	1	1	-	-	-
	Practical Hemodynamic monitoring	1	-	2	-	-
3	Lecture Syncope Epilepsy	1	1	-	-	-
	Practical Different Injections	1	-	2	-	-
4	Lecture Fluid and acid base management: Hypovolemia Hypervolemia Acid - Base Balance	1	1	-	-	-
	Practical Trauma and burn in ICU	1	-	2	-	-
5	Lecture Hematological disorders: Bleeding disorders Venous Thromboembolism Anticoagulation	1	1	-	-	-
	Practical Oxygen therapy	1	-	2	-	-
6	Lecture Infection: Sepsis ICU infection	1	1	-	-	-
	Practical Shock management	1	-	2	-	-
7						

	Periodical exam					
8	Lecture Prevention and Control of Multi-Drug-Resistant Organisms	1	1	-	-	-
	Practical Stroke (Intracranial hemorrhage) management	1	-	2	-	-
9	Lecture Nutritional support and therapy	1	1	-	-	-
	Practical Fluid management	1	-	2	-	-
10	Lecture Medical crise: Diabetic Ketoacidosis Hypoglycemia	1	1	-	-	-
	Practical Interpretation and management of acid-base disturbances	1	-	2	-	-
11	Lecture Anaphylaxis	1	1	-	-	-
	Practical Preventing Venous Thromboembolism and Glucose control in critically ill patients	1	-	2	-	-
12	Lecture Supportive care	1	1	-	-	-
	Practical Activity	1	-	2	-	-
13	Lecture Pain and analgesia	1	1	-	-	-
	Practical: Practical exam					
14	Lecture Revision	1	1	-	-	-
	Practical Open discussion	1	-	2	-	-
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 (periodical exam)	Week 7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	50	50%
4	Final Practical /Clinical/... Exam	Week 13	25	25%
5	Final Oral Exam	Week 15	10	10%
6	Activity (<u>Self-learning Activity</u>)	Week 12	5	5%
7	Assignment (formative assessment)		-	-
	Other (Mention)	-	-	-

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

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	1- Course Notes: Student book of Pharmacotherapy of Critical Care Patients (2025-2026) 2- Essential Books: - Undergraduate 4th,5th yearbook of the Department of Internal Medicine at the Faculty of Medicine, Zagazig University. - Critical Care Pharmacotherapy, 3rd Edition: This core textbook from the American College of Clinical Pharmacy (ACCP) - Pocket Guide to Critical Care Pharmacotherapy, 3rd Edition: This essential quick-reference tool from the Society of Critical Care Medicine (SCCM)
	Other References	ACCP PSAP & CCSAP Releases: series of specialized books from the American College of Clinical Pharmacy (ACCP).
	Electronic Sources (Links must be added)	www.ekb.eg www.Pubmed.com

		www.Sciencedirect.com
	Learning Platforms (Links must be added)	https://shortul.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Inst ruments	Computer, board
	Supplies	
	Electronic Programs	1. Microsoft office 2. 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. Fayrouz Othman Selim

**Name and Signature
Head of Department**

Ass. prof. Esraa Zakaria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Pharmacotherapy of Pediatric

Diseases

PP 010

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacotherapy of Pediatric Diseases			
Course Code (according to the bylaw)	PP 010			
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			
Academic level at which the course is taught	Level 5- semester 10			
Academic Program	Bachelor of Pharmacy (Pharm D - clinical pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Sanaa Mahmoud			
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)

On completion of the course, students will have the knowledge of normal physical and mental growth and development from birth to adolescence, and its clinical application from birth through adolescence. The course also aims to develop students' ability to deliver essential health care to pediatric patients (neonates, infants, children, and adolescents)

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.C1.7.1	Demonstrate foundational principles of pharmacy practice to ensure safe, effective, and patient-centered pharmacotherapy for pediatric diseases.
1-1-2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8.1	Emphasize and interpret essential pharmaceutical and medical terms, including those related to general examinations and specific pediatric disease states.
1-1-4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.11.1	Illustrate principles of pharmacology and pharmacotherapy to correctly choose medications (optimal drug selection) for managing various pediatric diseases.
		1.C1.12.1	Evaluate the suitability of medicines for individual patients with pediatric diseases, considering factors like disease cause, progression, medical history, potential drug interactions, and age.
1-1-6	Utilize scientific literature, and collect and interpret information to enhance professional decision.	1.C1.16.1	Develop the ability to gather and interpret patient information to provide precise advice and recommendations to prescribers

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
			regarding medication choices and dosages for pediatric conditions.
2-4-1	Ensure safe handling/ use of poisons to avoid their harm to individuals and communities	2.C4.1.1	Provide clear and accurate guidance to patients and healthcare professionals regarding the safe and effective application of medicines in pediatrics, including asthma, diabetes, pneumonia, or seizures, and the handling of malnutrition that could relate to many diseases.
3-1-4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.6.1	Formulate comprehensive therapeutic plans for various diseases and infections, integrating knowledge of their epidemiology, etiology, pathophysiology, laboratory diagnosis, and clinical features.
		3.C1.7.1	Assess the effectiveness of selected drug therapies for pediatric diseases by tracking patient progress and interpreting relevant laboratory results.
4-1-2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Apply problem-solving skills to identify health issues and collaboratively design effective management plans with other healthcare professionals.

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)

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 -Diarrhea	1	1	-	-	-
	Practical session - Dehydration case studies	2	-	1	-	-
2	Lecture Bronchial Asthma	1	2	-	-	-
	Practical session Resp. Distress in Newborns (Rds) case studies	2	-	1	-	-
3	Lecture Heart Failure	1	2	-	-	-
	Practical session Edema case studies	2	-	1	-	-
4	Lecture -Anemias Formative assessment (quiz1)	1	2	-	-	-
	Practical session Shock case studies	2	-	1	-	-
5	Lecture - Diabetes Mellitus	1	2	-	-	-
	Practical session Diabetic Ketoacidosis(Dka) case studies	2	-	1	-	-
6	Lecture Pneumonias	1	2	-	-	-
	Practical session Vaccinations case studies	2	-	1	-	-
7	Midterm exam					

8	Lecture Rheumatic Fever	1	2	-	-	-
	Practical session Lymphadenopathy case studies	2	-	1	-	-
9	Lecture Convulsions	1	2	-	-	-
	Practical session Neonatal Resuscitation case studies	2	-	1	-	-
10	Lecture - Hematuria Formative assessment (quiz 2)	1	2	-	-	-
	Practical session - Bleeding Disorders case studies - Orientation on Activity	2	-	1	_*	-
11	Lecture -Infant Feeding	1	2	-	-	-
	Practical exam Total Parenteral Nutrition case studies	2	-	1	-	-
12	Lecture Parasitic Infestations Formative assessment (quiz 3)	1	2	-	-	-
	Practical exam Jaundice case studies	2	-	1	-	-
13	Lecture General discussion and revision	1	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	_*	-
14	Lecture General discussion and revision	1	2	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	_*	-
15	Final written exam					

* As part of a self-learning activity in Pharmacotherapy of Pediatric Diseases 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.

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	Weeks 11 and 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 4,10,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book and practical notes approved by the department 2025-2026.
	Other References	
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com and

		www.sciencedirect.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board, Conductometer
	Supplies	-
	Electronic Programs	1. Microsoft office 2. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

**Name and Signature
Course Coordinator**

Prof. Dr. Sanaa Mahmoud

**Name and Signature
Head of Department**

Ass. Prof. Dr. Esraa Zakaria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Phytotherapy

PG 006

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Phytotherapy			
Course Code (according to the bylaw)	PG 006			
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 hrs/week	-	3 hrs/week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 5- semester 10			
Academic Program	Bachelor of pharmacy (Pharm D - Clinical Pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Samih El-Dahmy			
Course Specification Approval Date	18-8-2025			
Course Specification Approval (Attach the decision/minutes of the department /committee/council)	Department Council			

2. Course Overview (Brief summary of scientific content)

On completion of the course, students will be able to illustrate the fundamental knowledge about herbal medicine including preparation, identity, efficacy, standardization and its relation to conventional medicine, in addition to the use of herbal medications in some common health problems, its toxicological aspects, regulatory laws of production and forensic pharmacognosy.

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.C1.7.1	Illustrate the principles of alternative medicine (history and forms) and its relation to conventional medicine.
		1.C1.7.2	Outline the principles of herbal medicine preparation, identification, efficacy and standardization.
		1.C1.7.3	List different herbal medications to relief some common health problems such as GIT, Cardiac problems... etc.
1-1-4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.10.1	Identify pharmacological properties of some herbal medications used in some specific health problems; in addition to the adverse reactions and contraindications of these drugs and the concomitant use of these drugs with conventional medicine
3-2-3	Provide evidence-based information about safe use of complementary medicine including phytotherapy, aromatherapy, and nutraceuticals.	3.C2.4.1	Describe a herbal remedy for treatment of common health problems.
3-2-5	Educate and counsel patients, other health care professionals, and communities about safe and proper use of medicines including OTC preparations and medical devices.	3.C2.6.1	Practice patient counseling using case study.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
4-1-2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team	4.C1.5.1	Demonstrate critical thinking, problem-solving and decision-making abilities.
4-2-2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Develop information technology skills as well as presentation skills.

4. Teaching and Learning Methods

1. Interactive lectures
2. Practical sessions
3. Case-based learning.
4. Co-operative and self-learning (Activity).

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/.....)	Training (Practical/Clinical/.....)	Self-learning (Tasks/Assignments/Projects/...)	Other (to be determined)
1	Lecture -Definition, history and forms of alternative medicine. -Definition of nutraceuticals.	2	2	-	-	-
	Practical session - An introduction to the use of herbal medicine for the treatment of simple health problems.	2	-	1	-	-
2	Lecture -Herbal medicine versus conventional medicine -Drug-herb interaction.	2	2	-	-	-
	Practical session -Activity: Oral presentation for different forms of alternative medicine e.g: Homeopathy, chiropractic.....etc.	2	-	1	_*	-
3	Lecture -Herbal remedies for dermatologic use	2	2	-	-	-
	Practical session -Case study for dermatological use	2	-	1	_*	-
	Activity: Oral presentation for commercially available herbal market preparations used for dermatological use.					
4	Lecture -Herbal medications and nutraceuticals for respiratory tract problems.	2	2	-	-	-
	Practical session - Case study for cold and other respiratory disorders	2	-	1	_*	-

	Activity: Oral presentation for commercially available herbal market preparations used for respiratory tract disorders.					
5	Lecture -Herbal medications and nutraceuticals for obesity, hemorrhoids and skeletal muscle disorders. & Formative assessment (quiz 1)	2	2	-	-	-
	Practical session - Case study for obesity, hemorrhoids and skeletal muscle disorders.					
	Activity: Oral presentation for commercially available herbal market preparations used for obesity, hemorrhoids and skeletal muscle disorders.	2	-	1	_*	-
6	Lecture -Herbal medications and nutraceuticals for diabetes.	2	2	-	-	-
	Practical session -Case study for diabetes					
	Activity: Oral presentation for commercially available herbal market preparations used for diabetes.	2	-	1	_*	-
7	Midterm Exam					
8	Lecture -Herbal medications for cardiovascular disorders.	2	2	-	-	-
	Practical session - Case study for cardiovascular disorders					
	Activity: Oral presentation for commercially available herbal market preparations used for cardiovascular disorders.	2	-	1	_*	-
9	Lecture -Herbal medications and nutraceuticals for GIT disorders.	2	2	-	-	-
	Practical session -Case study for GIT disorders	2	-	1	_*	-

	Activity: Oral presentation for commercially available herbal market preparations used for GIT disorders.					
10	Lecture -Herbal remedies for hepatic disorders. Formative assessment (quiz 2)	2	2	-	-	-
	Practical session - Case study for hepatic disorders.					
	Activity: Oral presentation for commercially available herbal market preparations used for hepatic disorders.	2	-	1	_*	-
11	Lecture -Herbal medications for CNS disorders.	2	2	-	-	-
	Practical session - Case study for CNS disorders.					
	Activity: Oral presentation for commercially available herbal market preparations used for CNS disorders.	2	-	1	_*	-
12	Lecture -Herbal medications for renal (urinary tract) disorders.	2	2	-	-	-
	Practical session - Case study for renal (urinary tract) disorders.					
	Activity: Oral presentation for commercially available herbal market preparations used for renal (urinary tract) disorders.	2	-	1	_*	-
13	Lecture -General discussion and revision	2	2	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture -General discussion and revision	2	2	-	-	-
	Practical session -Discussion and Assessment of activity	2	-	1	_*	-
15	Final Written and Oral Exams					

* As part of a self-learning activity in phytotherapy course, a part of practical session was specified for the explanation of activity guidelines, rules and assessment rubric. Also, practical sessions were

facilitated for students to present their reports on the various activity self-learning topics according to the announced student distribution on topics. Supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

6. Methods of students' assessment

No.	Assessment Methods *	Assessment Timing (Week Number)	Marks/ Scores	Percentage of total course Marks
1	Exam 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 2-6, 8-12 and 14	5	5%
7	Assignment (Formative assessment)	Weeks 5 and 10	-	-
8	Other (Mention)	-	-	-

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

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student's book and practical notes of "Phytotherapy" approved by the Pharmacognosy Department (2025-2026).
	Other References	• Andrew C. Herbal Remedies Handbook. 2nd Ed., Published by Dorling Kindersley Ltd., Delhi, 2018 • HEINRICH, Michael, et al. Fundamentals of Pharmacognosy and Phytotherapy E-Book. Elsevier Health Sciences, 2017. • EASLEY, Thomas; HORNE, Steven. The modern herbal dispensatory: A medicine-making guide. North Atlantic Books, (2016). • Evans, W.C.; Pharmacognosy; Saunders-Elsevier (2009). • Michael H., Joanne B., Jose P. G., Elizabeth M. W., Simon G. Fundamentals of Pharmacognosy

		and Phytotherapy, 3rd Ed., Published by Elsevier, 2018 • TOBYN, Graeme; DENHAM, Alison; WHITELEGG, Midge. The Western herbal tradition: 2000 years of medicinal plant knowledge. Singing Dragon, (2016). • The honest herbal; Varror, T. and Foster, S.; Haworth Herbal Press, Binghamton, NY. (1999). • Herbal medicine: a clinical guide; Miller, L. and Murray, W.; Pharmaceutical Products Press, Binghamton, NY. (1998).
	Electronic Sources (Links must be added)	• Journal of Natural Products • J. Ethnopharmacology • Planta Medica • Phytoterapia • www.sciencedirect.com • 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	Computer, data show, board
	Supplies	-
	Electronic Programs	3. Microsoft office 4. 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. Samih El-Dahmy

Name and Signature
Head of Department

Prof. Dr. Amal Al-Gendy

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

**Pharmacotherapy of
Cardiovascular Diseases**

PP 011

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacotherapy of Cardiovascular Diseases			
Course Code (according to the bylaw)	PP 011			
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			
Academic level at which the course is taught	Level 5- semester 10			
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. Shimaa Gamal			
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)

On completion of the course, students will be able to provide appropriate Cardiovascular health care to patients inside and outside hospitals as a member of the healthcare team through the design of proper therapeutic plans in collaboration with physicians, proper drug monitoring and studying drug pharmacokinetics resulting in improvement of healthcare outcomes and patient safety.

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.C1.7.1.	Identify the principles and fundamentals of pharmacotherapy of cardiovascular diseases that based on understanding the pathophysiology of the disease.
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8.1.	Recognize the appropriate pharmaceutical, medical terms, abbreviations and symbols regarding pharmacotherapy of cardiovascular diseases.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations.	1.C1.11.1.	State the pharmacological and pharmacotherapeutic principles in ideal selection of appropriate drug therapy, monitoring outcomes in management of different cardiovascular diseases.
		1.C1.12.1.	Select appropriate medicines for various cardiovascular diseases based on aetiology, pathophysiology, severity, patient medical history, possible interactions and age-related factors.

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
1.1.6	Utilize scientific literature and collect information and to interpret enhance professional decision.	1.C1.16.1	Recall basic pharmacotherapy information to provide recommendations to the prescriber on recent guidelines regarding pharmacotherapy of cardiovascular diseases.
2.4.1	Ensure safe handling/ use of poisons to avoid their harm to individuals and communities.	2.C4.1.1	Provide guidance to patients and other healthcare professionals on the appropriate and safe use of medications and hazardous substances.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.6.1	Prepare therapeutic plans for a given cardiovascular disease based on its etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of the disease.
		3.C1.7.1	Modify the selected drug therapy based on the patient's progress and laboratory results.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Prioritize problem solving skills including problem identification and design of management plan in collaboration with other health care professionals.

4. Teaching and Learning Methods

- Lectures
- Practical sessions (case studies)
- Blended learning

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 - Anatomy and physiology of Cardiovascular system	1	1	-	-	-
	Practical session - Important symptoms of Cardiovascular diseases	2	-	1	-	-
2	Lecture Rheumatic fever	1	1	-	-	-
	Practical session Important signs of Cardiovascular diseases	2	-	1	-	-
3	Lecture Heart Failure	1	1	-	-	-
	Practical session Therapeutic modalities	2	-	1	-	-
4	Lecture - Arrhythmias Formative assessment (quiz1)	1	1	-	-	-
	Practical session Different drug therapy and interventional therapy	2	-	1	-	-
5	Lecture - Infective endocarditis	1	1	-	-	-
	Practical session Rheumatic fever (Case study)	2	-	1	-	-
6	Lecture Anticoagulants	1	1	-	-	-
	Practical session Heart Failure+ Arrhythmias (Case study)	2	-	1	-	-
7	Midterm exam					

8	Lecture Pulmonary embolism	1	1	-	-	-
	Practical session Infective endocarditis (Case study)	2	-	1	-	-
9	Lecture Types of Hypertensions	1	1	-	-	-
	Practical session Pulmonary embolism+ Anticoagulant (Case study)	2	-	1	-	-
10	Lecture - Pharmacotherapy of Hypertension Formative assessment (quiz 2)	1	1	-	-	-
	Practical session - Coronary artery disease (Case study)	2	-	1	-*	-
11	Lecture - Chronic coronary syndrome	1	1	-	-	-
	Practical session Coronary artery disease (Case study)	2	-	1	-	-
12	Lecture Acute coronary syndrome Formative assessment (quiz 3)	1	1	-	-	-
	Practical session Dyslipidemia (Case study)	2	-	1	-*	-
13	Lecture - Dyslipidemia	1	1	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture Revision	1	1	-	-	-
	Practical session Activity (Role play/presentation)	2	-	1	-*	-
15	Final written exam					

* As part of a self-learning activity in Pharmacotherapy of Cardiovascular Diseases course, a part of practical session in week 12 was specified for the explanation of activity guidelines, rules

and assessment rubric. Also, practical sessions in weeks 14 were facilitated for students to present their reports on the various activity self-learning topics according to the announced student distribution on topics. Supervisors engaged students in a discussion to evaluate the key skills acquired, findings, and conclusions they reached. The activity was formally evaluated against a set of established criteria to ensure a rigorous and consistent assessment.

6. Methods of students' assessment

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

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book of Treatment of Cardiovascular System Diseases approved by Cardiology department 2025. ESC Handbook on Cardiovascular Pharmacotherapy. Cardiovascular pharmacotherapy: a new ESC Handbook comprehensively addresses pharmacological treatment issues for patients with cardiovascular disease.
	Other References	1. Braunwald's Heart Disease: A Textbook of Cardiovascular Medicine. 2. us Cardiovascular Pharmacotherapeutics.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ http://chemwiki.ucdavis.edu/

		www.Pubmed.Com and www.sciencedirect.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Black (white) boards, data show, air conditioned classroom
	Supplies	None.
	Electronic Programs	5. Microsoft office 6. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

**Name and Signature
Course Coordinator**

Ass. Prof. Dr. Shimaa Gamal

**Name and Signature
Head of Department**

Ass. Prof. Esraa Zakria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Pharmacotherapy of

Gastrointestinal Diseases

PP 012

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacotherapy of Gastrointestinal Diseases			
Course Code (according to the bylaw)	PP 012			
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 hr./week	1 hr./week	-	2 hrs./week
Course Type	Faculty Requirements			
Academic level at which the course is taught	Level 5- semester 10			
Academic Program	Bachelor of Pharmacy (Pharm D -Clinical Pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Hoda Abdelaziz El-Hady			
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)

On completion of the course, students will be able to explain symptoms, signs, investigations & pharmacotherapy of common hepato-gastro-enterology 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.C1.7.1.	Demonstrate foundational principles of pharmacy practice to ensure safe, effective, and patient-centered pharmacotherapy for gastrointestinal (GI) and hepatobiliary diseases.
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	1.C1.8.1.	Emphasize and interpret essential pharmaceutical and medical terms, including those related to general examinations and specific GI/hepatobiliary disease states.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations	1.C1.11.1	Illustrate principles of pharmacology and pharmacotherapy to correctly choose medications (optimal drug selection) for managing various GI and liver diseases.
		1.C1.12.1	Evaluate the suitability of medicines for individual patients with GI and liver disorders, considering factors like disease cause, progression, medical history, potential drug interactions, and age.
1.1.6	Utilize scientific literature, and collect and interpret information to enhance professional decision	1.C1.16.1	Develop the ability to gather and interpret patient information to provide precise advice and recommendations to prescribers regarding medication choices and dosages for GI and liver 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
2.4.1	Ensure safe handling/ use of poisons to avoid their harm to individuals and communities	2.C4.1.1	Provide clear and accurate guidance to patients and healthcare professionals regarding the safe and effective application of medicines in the GIT, including GERD, PUD, IBD, or IBS, and the handling of toxic substances that could relate to diseases such as liver toxicity.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.6.1	Formulate comprehensive therapeutic plans for various diseases and infections, integrating knowledge of their epidemiology, etiology, pathophysiology, laboratory diagnosis, and clinical features.
		3.C1.7.1	Assess the effectiveness of selected drug therapies for GI and liver disorders by tracking patient progress and interpreting relevant laboratory results.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Apply problem-solving skills to identify health issues and collaboratively design effective management plans with other healthcare professionals.

4. Teaching and Learning Methods

- Lectures
- Practical: Problem solving.
- Self-learning

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 - Structure & functions of different parts of GIT	1	1	-	-	-
	Practical session - General examinations: Pallor, Clubbing,	2	-	1	-	-
2	Lecture - GERD	1	1	-	-	-
	Practical session General examinations: Koilonychia, Dysphagia	2	-	1	-	-
3	Lecture Peptic ulcer disease	1	1	-	-	-
	Practical session Jaundice	2	-	1	-	-
4	Lecture - Ulcerative Colitis Formative assessment (quiz1)	1	1	-	-	-
	Practical session Jaundice	2	-	1	-	-
5	Lecture - Crohn's disease	1	1	-	-	-
	Practical session Abdominal pain	2	-	1	-	-
6	Lecture Irritable bowel syndrome	1	1	-	-	-
	Practical session Diarrhea	2	-	1	-	-

7	Midterm exam					
8	Lecture Upper GIT bleeding& Lower Gastrointestinal Bleeding	1	1	-	-	-
	Practical session Constipation	2	-	1	-	-
9	Lecture Viral Hepatitis	1	1	-	-	-
	Practical session Ascites	2	-	1	-	-
10	Lecture - Alcoholic Fatty Liver Disease. Nonalcoholic Liver Disease Formative assessment (quiz 2)	1	1	-	-	-
	Practical session - IBD cases	2	-	1	_*	-
11	Lecture - Autoimmune Liver Disease Drug-Induced Liver Diseases	1	1	-	-	-
	Practical session IBS cases	2	-	1	-	-
12	Lecture Hepatic Encephalopathy Formative assessment (quiz 3)	1	1	-	-	-
	Practical session Viral hepatitis cases	2	-	1	_*	-
13	Lecture - Acute Pancreatitis Chronic Pancreatitis	1	1	-	-	-
	Practical exam	2	-	1	-	-
14	Lecture General discussion and revision.	1	1	-	-	-
	Practical session Activity	2	-	1	_*	-
15	Final written exam and oral exam					

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

6. Methods of students' assessment

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

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	1. Student book: overview of Gastroenterology & Hepatology. (approved by Hepato-gastro-enterology unit, Internal Medicine Dep. 2025-2026) 2. Zeind, C. S., Carvalho, M. G., Cheng, J. W. M., Zaiken, K., & LaPointe, T. (2023). Applied therapeutics: The clinical use of drugs (12th ed.). Wolters Kluwer. 3. Brunton, L. L., Knollmann, B. C., & Hilal-Dandan, R. (Eds.). (2023). Goodman &
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		Gilman's the pharmacological basis of therapeutics (14th ed.). McGraw-Hill. 4. Katzung, B. G., & Vanderah, T. W. (2021). Katzung's basic & clinical pharmacology (15th ed.). McGraw-Hill Education.
	Other References	3. Holst, C. N. (2023). Advanced pharmacology for prescribers: A clinical approach. Springer Publishing Company. 4. Aronson, J. K. (Ed.). (2022). Meyler's side effects of gastrointestinal drugs (16th ed., vol. 12). Elsevier.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com and www.sciencedirect.com www.medscape.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Black (white) boards, data show, air-conditioned classroom
	Supplies	None.
	Electronic Programs	7. Microsoft office 8. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator

Prof. Hoda Abdelaziz El-Hady.

Name and Signature
Head of Department

Ass. Prof. Esraa Zakria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Pharmacotherapy of

Respiratory Diseases

PP 013

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Pharmacotherapy of Respiratory Diseases			
Course Code (according to the bylaw)	PP 013			
Department/s participating in the 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			
Academic level at which the course is taught	Level 5- semester 10			
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. Nagwan Adel			
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)

On completion of the course, students will be able to provide appropriate respiratory health care to patients inside and outside hospitals as a member of the healthcare team through the design of proper therapeutic plans in collaboration with physicians, proper drug monitoring and studying drug pharmacokinetics resulting in improvement of healthcare outcomes and patient safety.

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.C1.7.1	Integrate principles of pharmacy practice and clinical sciences into the pharmacotherapy of respiratory diseases
1.1.2	Utilize the proper pharmaceutical and medical terms, abbreviations, and symbols in pharmacy practice	1.C1.8.1	Use appropriate pharmaceutical and medical terms, abbreviations, and symbols accurately when managing and communicating pharmacotherapy plans for respiratory diseases.
1.1.4	Articulate knowledge from fundamental sciences to explain drugs' actions and evaluate their appropriateness, effectiveness, and safety in individuals and populations	1.C1.11.1	Apply pharmacological and pharmacotherapeutic principles in selecting appropriate medication
		1.C1.12.1	Assess the appropriateness of respiratory medications based on the disease's aetiology, pathophysiology.
1.1.6	Utilize scientific literature, and collect and interpret information to enhance professional decision.	1.C1.16.1	Collect and interpret patient and disease-specific information to provide appropriate recommendations on respiratory medication selection and dosing to prescribers.

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
2.4.1	Ensure safe handling/ use of poisons to avoid their harm to individuals and communities.	2.C4.1.1	Advise patients and healthcare professionals on the safe and effective use of respiratory medications.
3.1.4	Relate etiology, epidemiology, pathophysiology, laboratory diagnosis, and clinical features of infections/diseases and their pharmacotherapeutic approaches.	3.C1.6.1	Develop therapeutic plans for respiratory diseases based on their etiology, epidemiology, and pathophysiology.
		3.C1.7.1	Evaluate respiratory drug therapy by monitoring patient progress and interpreting relevant laboratory results to ensure optimal treatment outcomes.
4.1.2	Retrieve and critically analyze information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Develop problem-solving skills to identify therapeutic challenges and design effective management plans for respiratory diseases in collaboration with other healthcare professionals.

4. Teaching and Learning Methods

8. Lectures (data show, board)
9. Practical sessions
10. Problem solving (Practical)
11. Self- learning (Activity)
12. 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 Anatomy and physiology of the respiratory system	1	1	-	-	-
	Practical session Important symptoms of respiratory diseases.	2	-	1	-	-
2	Lecture Bronchial asthma	1	1	-	-	-
	Practical session Important signs of respiratory diseases	2	-	1	-	-
3	Lecture COPD	1	1	-	-	-
	Practical session Therapeutic modalities and Inhalation devices	2	-	1	-	-
4	Lecture Upper and lower respiratory tract infection ;Pneumonia	1	1	-	-	-
	Formative assessment (quiz1) Practical session Oxygen delivery systems	2	-	1	-	-
5	Lecture - Tuberculosis, Suppurative lung syndrome	1	1	-	-	-
	Practical session Tuberculosis, Suppurative lung syndrome Case study	2	-	1	-	-
6	Lecture	1	1	-	-	-

	Pulmonary embolism and Pulmonary hypertension					
	Practical session Pulmonary embolism Case study	2	-	1	-	-
7	Midterm exam					
8	Lecture Interstitial lung disease ,drug induced lung diseases	1	1	-	-	-
	Practical session Interstitial lung disease ,drug induced lung diseases Case study	2	-	1	-	-
9	Lecture Bronchogenic carcinoma	1	1	-	-	-
	Practical session Bronchogenic carcinoma Case study	2	-	1	-	-
10	Lecture Respiratory failure, life-threatening pulmonary emergencies Formative assessment (quiz 2)	1	1	-	-	-
	Practical session Respiratory failure Case study	2	-	1	_*	-
11	Lecture Respiratory infection control measures	1	1	-	-	-
	Practical exam Respiratory infection Case study	2	-	1	-	-
12	Lecture Pregnancy and obesity related disorders Formative assessment (quiz 3)	1	1	-	-	-
	Practical exam	2	-	1	-	-
13	Lecture General discussion and revision	1	1	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	_*	-

14	Lecture General discussion and revision	1	1	-	-	-
	Practical session Discussion and Assessment of activity	2	-	1	_*	-
15	Final written exam					

* As part of a self-learning activity in Pharmacotherapy of Respiratory Diseases 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.

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	Weeks 11 and 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 4,10,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Student book of Treatment of Respiratory System Diseases approved by the Chest Department 2025/2026
	Other References	1. Course Notes Student book of Treatment of Respiratory System Diseases approved by Chest department 2024. 2. Practical Notes of Treatment of Respiratory System Diseases approved by Chest department 2024.
	Electronic Sources (Links must be added)	https://www.ekb.eg/ www.Pubmed.Com and www.sciencedirect.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board, Conductometer
	Supplies	-
	Electronic Programs	9. Microsoft office 10. Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

Name and Signature
Course Coordinator

Ass. Prof. Dr. Nagwan Adel

Name and Signature
Head of Department

Ass. Prof. Dr. Esraa Zakaria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Clinical Research and

Pharmacovigilance

PP 014

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Clinical Research and Pharmacovigilance			
Course Code (according to the bylaw)	PP 014			
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
Course Type	Faculty Requirements اجباري			
Academic level at which the course is taught	Level 5- semester 2			
Academic Program	Bachelor of Pharmacy (Pharm D- Clinical Pharmacy)			
Faculty/Institute	Faculty of pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Ass. Prof. Esraa Mohamed Najib Zakaria			
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)

. The course provides students with information about the basic principles of research methodology: design experiments, analyze data, evaluate results, report findings, and write a scientific manuscript, in addition to, ethical guidelines in drug research. This course also provides the students with an understanding of pharmacovigilance importance, concept, processes, systems, global safety standards and regulations and reporting systems.

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	State the principles of writing a scientific manuscript.
		1.C1.7.1	List the principles of research methodology (including design of experiments, types of experiments, and data collection, analysis, and reporting) and the principles of pharmacovigilance.
2.5.3	Contribute in planning and conducting research studies using appropriate methodologies	2.C5.4.1	Design clinical and pharmacovigilance studies and prepare a clear, concise report of the research plan.

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.C5.5.1.	Perform a research project following ethical guidelines in an appropriate scientific manner
3.2.2	Apply the principles of clinical pharmacology and pharmacovigilance for the rational use of medicines and medical devices.	3.C2.2.1	Provide future perspectives in clinical research and pharmacovigilance practice for safe use of medicines.

4. Teaching and Learning Methods

Lectures (data show, board)

Self- learning (Activity)

Case discussion

Open discussion

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 Principles of research methodology: Design of experiments	1	1	-	-	-
2	Lecture - Principles of research methodology: Types of experiments	1	1	-	-	-
3	Lecture Principles of research methodology: Data collection	1	1	-	-	-
4	Lecture Principles of research methodology: Data analysis and reporting Formative assessment (quiz 1)	1	1	-	-	-
5	Lecture Scientific manuscript: Writing and construction	1	1	-	-	-

6	Lecture Ethical guidelines in drug research	1	1	-	-	-
7	Midterm exam					
8	Lecture Controlled clinical trial	1	1	-	-	-
9	Lecture Controlled clinical trial	1	1	-	-	-
10	Lecture Pharmacovigilance (Principles and Historical Background) Formative assessment (quiz 2)	1	1	-	-	-
11	Lecture Pharmacovigilance (Adverse Drug Reactions (ADRs) – Classification and Detection)	1	1	-	-	-
12	Lecture Pharmacovigilance (Reporting Systems and Global Regulatory Frameworks)	1	1	-	-	-
13	Lecture Pharmacovigilance (Risk Management, Signal Detection, and Pharmacovigilance in Clinical Practice)	1	1	-	-	-

14	Lecture Revision, Presentation	1	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	20	15%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week 15	75	75%
4	Final Practical /Clinical/... Exam	-	-	-
5	Final Oral Exam	-	-	-
6	Presentation (Self-learning Activity)	Weeks 14	5	10%
7	Assignment (Formative assessment)	Weeks 4,10	-	-
8	Other (Mention)	-	-	-

7. 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 “clinical research and Pharmacovigilance ” approved by the pharmacy practice department 2025-2026.
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references, etc.) *	Other References	- i- A Textbook of Clinical Research and Pharmacovigilance, Chowdary, K., PharmaMed Press (2021). - ii- Principles of Research Methodology: A Guide for Clinical Investigators. United States: Springer New York (2016). - iii- Basic Principles of Clinical Research and Methodology. Gupta, S., Gupta, S. K. India: Jaypee Brothers Medical Publishers Pvt. Limited (2007). - iv- Fundamentals of Research Methodology for Health Care Professionals. Brink, H., Van der Walt, C. United Kingdom: Juta (2006).
	Electronic Sources (Links must be added)	Journal of pharmaceutical sciences www.Pubmed.com www.Sciencedirect.com
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	https://shorturl.at/sar8D
	Other (to be mentioned)	-

Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board
	Supplies	-
	Electronic Programs	1.Microsoft office 2.Microsoft teams
	Skill Labs/ Simulators	-
	Virtual Labs	-
	Other (to be mentioned)	-

**Name and Signature
Course Coordinator**

Ass. prof. Esraa Zakaria

**Name and Signature
Head of Department**

Ass. prof. Esraa Zakaria

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Biostatistics

PO 007

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Biostatistics			
Course Code (according to the bylaw)	PO 007			
Department/s participating in delivery of the course	Pharmacology and Toxicology Department			
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 5- semester 10			
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. Nesreen Ibrahim			
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 understand and apply basic statistical concepts, including descriptive statistics, probability distributions and hypothesis testing, analyze data using appropriate statistical tools, interpret and critically evaluate statistical outcomes in clinical and pharmaceutical research and select appropriate methods for presenting different typed of data

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.C1.6.1	Identify types and levels of data (qualitative and quantitative), scales of measurement (nominal, ordinal, interval, ratio)
		1.C1.6.2	Select appropriate methods for presenting different types of data (using graphs, tables, and charts)
		1.C1.6.3	Illustrate and compute measures of central tendency and variability (mean, median, mode, standard deviation), apply probability distributions
		1.C1.6.4	Select appropriate statistical tests (e.g., t-tests, ANOVA, chi-square) for hypothesis testing, identify the assumptions underlying correlation and linear regression, recognize the components of a survival curve, and identify factors that influence sample size requirements.

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
		1.C1.6.5	Interpret outputs from statistical calculations (confidence intervals, p-values, and correlation/regression analyses), assess biostatistical findings' validity, reliability, and clinical relevance for health-related decision-making.
2.2.4	Adopt the principles of pharmaceutical calculations, biostatistical analysis, bioinformatics, pharmacokinetics, and biopharmaceutics and their applications in new drug delivery systems, dose modification, bioequivalence studies, and pharmacy practice.	2.C2.12.1	Apply appropriate biostatistical techniques to analyze pharmaceutical datasets.
		2.C2.12.2	Analyze clinical or experimental data using biostatistical tools to draw valid conclusions.
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 critical thinking and problem-solving using statistical reasoning.

4. Teaching and Learning Methods

- Lectures (data show, board)
- Self- learning (Activity)
- Problem-based learning (Activity)
- 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 - Background and Definitions	1	1	-	-	-
2	Lecture - Presentation of Data	1	1	-	-	-
3	Lecture - Descriptive statistics	1	1	-	-	-
4	Lecture Theoretical distribution Formative assessment (quiz 1)	1	1	-	-	-
5	Lecture Transformation	1	1	-	-	-
6	Lecture Sampling and sampling distributions	1	1	-	-	-
7	Midterm exam					
8	Lecture Hypothesis testing (Significance testing) Hypothesis testing: one-sample	1	1	-	-	-
9	Lecture Hypothesis testing: two groups	1	1	-	-	-
10	Lecture Hypothesis testing: more than two groups Formative assessment (quiz 2)	1	1	-	-	-

11	Lecture Hypothesis testing: Chi-square test	1	1	-	-	-
12	Lecture Correlation & Linear regression Formative assessment (quiz 3) Activity1 (Report; problem solving)	1	1	-	-	-
13	Lecture Survival Analysis Checking assumptions Sample size calculations Activity2 (Report; problem solving)	1	1	-	-	-
14	Revision	1	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	15	15%
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)	Week 12,13	10	10%
7	Assignment (Formative assessment)	Week 4,10,12	-	-
8	Other (Mention)	-	-	-

7. Learning Resources and Supportive Facilities

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	- Student book of “Biostatistics ” approved by the pharmacology and toxicology department 2025-2026.
	Other References	5. Medical Statistics at a Glance; 4th Edition, Petrie A and Sabin C (2020); Wiley Blackwell. 6. Daniel, W. W., & Cross, C. L. (2018). Biostatistics: A foundation for analysis in the health sciences (11th ed.). Wiley 7. Dinov, I. D. (2023). Data science and predictive analytics: Biomedical and health applications using R (2nd ed.). Springer. 8. Sharma, A., & Kaur, H. (2023). Biostatistics with R: A guide for medical doctors. Springer.
	Electronic Sources (Links must be added)	- Graphpad Prism online guidelines and resources (https://www.graphpad Prism online .com/scientific-software/prism/) - ClinCalc Academy. (2024). Biostatistics Rx: Online course for healthcare professionals. (https://clincalc.com/biostatisticsrx)
	Learning Platforms (Links must be added) <u>Electronic platform of Faculty of Pharmacy- Zagaig University for students</u>	http://phstudent.eps.zu.edu.eg/Views/StudentViews/StudentLogin
	Other (to be mentioned)	Recommended books and websites 1. Introductory Biological Statistics, fourth edition. 2. Statistical methods for disease clustering 3. Basics of Biostatistics. 4. Quantitative methods for health research. 5. - Http://www.edx.org/
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	White boards, data show, air-conditioned classroom
	Supplies	-
	Electronic Programs	1. Microsoft office 2. Microsoft teams 3. Graphpad prism
	Skill Labs/ Simulators	-
	Virtual Labs	-

	Other (to be mentioned)	-
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Name and Signature
Course Coordinator
Ass. Prof. Dr. Nesreen Ibrahim

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

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Bioinformatics

MD 007

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Bioinformatics			
Course Code (according to the bylaw)	MD 007			
Department/s participating in delivery of the course	Biochemistry Department & Microbiology and Immunology Department			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1			
	1 hr/week	-	-	1 hr/week
Course Type	Faculty requirements			
Academic level at which the course is taught	Level 5 / semester 10			
Academic Program	Bachelor of Pharmacy (Pharm D - clinical pharmacy)			
Faculty/Institute	Faculty of Pharmacy			
University/Academy	Zagazig university			
Name of Course Coordinator	Prof. Dr. Nahla Younis			
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 understand the Basics of Bioinformatics, Genomic sequences, Sequence alignment, Molecular phylogeny and evolution, Human variation and disease, linking genes and disease, Sequence variation, comparative genomics, personalized medicine, and multiple testing. In addition, students will be able to utilize tools to perform BLAST, Multiple sequence alignment, mRNA and gene expression analysis. Students will also Develop critical thinking skills, communicate skills, in addition to group working.

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, bi-omedical, social, behavioral, administrative, and clinical sciences.	1.C1.3.1	Outline different types of biological data bases
		1.C1.3.2	Review the basic concepts of BLAST, Multiple sequence alignment, Molecular phylogeny
		1.C1.3.3	Summarize the principles of mRNA and gene expression analysis
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.C2.11.1	Utilizing and application of various biological databases.
		2.C2.11.2	Recognize the available bioinformatics tools (software) and select the most suitable one for desired application (e.g. primer design software)

Program Outcomes (NARS/ARS) (according to the matrix in the program specs)		Course Learning Outcomes Upon completion of the course, the student will be able to:	
Code	Text	Code	Text
3-1-1	Apply the principles of body function and basis of genomics in health and disease states to manage different diseases.	3.C1.1.1	Illustrate the concepts of Human variation and disease, and be able to Link gene variation and mutation to certain diseases
4-2-2	Use contemporary technologies and media to demonstrate effective presentation skills.	4.C2.3.1	Acquire online search skills, and develop skills for data analysis using suitable software and interpretation of results

4. Teaching and Learning Methods

1. Lectures
2. Blended-learning (internet search & software utilization)

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	Introduction to Bioinformatics and biological data	1	1	--	-	-
2	Biological data bases	1	1	---	-	-
3	Sequences and sequence alignment	1	1	--	-	-
4	Multiple sequence alignment /BLAST Formative assessment Quiz 1	1	1	--	-	-
5	Introduction to Molecular phylogeny	1	1	--	-	-
6	Primer design for PCR and qRT-PCR (Activity 1)	1	1	--	-	-
7	Midterm exam					
8	Array data interpretation	1	1	--	-	-
9	Differential expression, normalization, visualization /clustering	1	1	--	-	-
10	Gene Pattern, Statistics for differential expression, Present and discuss the data of assignment, (Activity 2)	1	1	--	-	-
11	Characterizing eukaryotic genomes, Human variation and disease, Linking genes and disease,	1	1	--	-	-
12	Applications of bioinformatics Formative assessment Quiz 2	1	1	--	-	-
13	Linking genes and diseases	1	1	--	-	-
14	Final revision	1	1	--	-	-
15	Final written exam					

6. 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 (Mid-term Exam)	Week 7	15	15%
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 6,10	10	10%
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)	Student book of Bioinformatics approved by Biochemistry & Microbiology and Immunology department 2025
	Other References	1. Shaik, N. A., Hakeem, K. R., Banaganapalli, B., & Elango, R. (2019). Essentials of Bioinformatics, Volume I. Springer International Publishing, Cham. 2. Xiong, J. (2006). Essential bioinformatics. Cambridge University Press.
	Electronic Sources (Links must be added)	1- www.ekb.eg 2- www.Pubmed.com 3- 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 / Data show
	Supplies	White/black board
	Electronic Programs	1- BLAST tools (tutorial) 2- Microsoft office 3- Microsoft teams
	Skill Labs/ Simulators	
	Virtual Labs	
	Other (to be mentioned)	

Name and Signature
Course Coordinator

Prof. Dr / Nahla Younis

Name and Signature
Head of department

Ass. Prof. Dr / Rana Eissa

COURSE SPECIFICATIONS

Bachelor of Pharmacy

(Pharm D - Clinical Pharmacy)

Professional practice

PP 015

Fifth level –Semester 10

2025-2026

Course Specification

(2025-2026)

1. Basic Information

Course Title (according to the bylaw)	Professional practice			
Course Code (according to the bylaw)	PP 015			
Department/s participating in delivery of the course	Pharmacy practice			
Number of credit hours/points of the course (according to the bylaw)	Theoretical	Practical	Other (specify)	Total
	1 hr/week	1 hr/week	-	2 hrs/week
Course Type	Faculty requirements			
Academic level at which the course is taught	Level 5 – Semester 10			
Academic Program	Bachelor of Pharmacy, pharm D (Clinical Pharmacy Pharm D)			
Faculty/Institute	Pharmacy			
University/Academy	Zagazig			
Name of Course Coordinator	Prof. Dr. Shereen sabry			
Course Specification Approval Date	8/25/2025			
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)

On completion of the course, Students are introduced to professional problem solving and decision making appropriate to the patient. The course is based on simulated case management format with emphasis on aspects of drug delivery and formulation, the role of the pharmacist in optimizing the use of medicines and improving health outcomes whether over-the-counter (OTC) medications or chronic disease state management, extemporaneous dispensing issues and calculations and some legal and ethical aspects of dispensing and related pharmacy practice issues.

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.C1.7.1	State the principles of pharmacy practice & clinical sciences to identify different drug and patient related problems and manage it.
2-1-1	Utilize the proper pharmaceutical and medical terms, abbreviations and symbols in pharmacy practice	2.C1.1.1	Carry out duties in compliance with the national code of ethics for pharmacists.
2-5-2	Retrieve, interpret, and critically evaluate evidence-based information needed in pharmacy profession.	2.C5.3.1	Demonstrate the ability to make accurate, evidenced based and timely decisions for the management of patients.
4-1-2	Retrieve and critically analyse information, identify and solve problems, and work autonomously and effectively in a team.	4.C1.5.1	Develop problem solving skills including problem identification and design of management plan.

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	Use appropriate communication skills with patients and other health care professionals.
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

Lectures

Practical session (case study, role play, problem solving)

Self-learning (activity)

5. Course Schedule

Number of the Week	Scientific content of the course (Course Topics)	Total Weekly Hours	Expected number of the Learning Hours			
			Theoretical teaching (lectures/discussion groups/)	Training (Practical/Clinical/)	Self-learning (Tasks/ Assignments/ Projects/ ...)	Other (to be determined)
1	Lecture Professional practice principles and standards	2	1	-	-	-
	Practical Medication Safety and Documentation	2	-	1	-	-
2	Lecture Professional practice principles and standards	2	1	-	-	-
	Practical OTC medicines/pharmacy medicines regulations	2	-	1	-	-
3	Lecture Professional practice principles and standards	2	1	-	-	-
	Practical OTC Medications for Musculoskeletal problems	2	-	1	-	-
4	Lecture professional problem solving and decision making appropriate to the patient Formative assignments	2	1	-	-	-
	Practical Smoking Cessation	2	-	1	-	-
5	Lecture professional problem solving and decision making appropriate to the patient	2	1	-	-	-
	Practical Prevention of Heart Disease and evaluation of risk factors	2	-	1	-	-
6	Lecture simulated case management format with emphasis on aspects of drug delivery and formulation	2	1	-	-	-
	Practical Extemporaneous Compounding	2	-	1	-	-
7	Midterm exam					

8	Lecture legal and ethical aspects of dispensing and related pharmacy practice issues	2	1	-	-	-
	Practical Role of pharmacists in chronic diseases management+ activity	2	-	1	-	-
9	Lecture legal and ethical aspects of dispensing and related pharmacy practice issues	2	1	-	-	-
	Practical Hair Loss Clinical Cases+ activity	2	-	1	-	-
10	Lecture the role of the pharmacist in optimizing the use of medicines and improving health outcomes with over- the-counter (OTC) medications	2	1	-	-	-
	Practical professional problem solving and decision making appropriate to the patient (cases)	2	-	1	-	-
11	Lecture the role of the pharmacist in optimizing the use of medicines and improving health outcomes : chronic disease state management	2	1	-	-	-
	Practical professional problem solving and decision making appropriate to the patient (cases)	2	-	1	-	-
12	Lecture The role of pharmacist in extemporaneous dispensing issues and calculations Formative assignment	2	1	-	-	-
	Practical professional problem solving and decision making	2	-	1	-	-

	appropriate to the patient (cases)					
13	Lecture Revision and open discussion	2	1	-	-	-
	Practical professional problem solving and decision making appropriate to the patient (cases)	2	-	1	-	-
14	Lecture Revision and open discussion	2	1	-	-	-
	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 (periodical exam)	Week7	10	10%
2	Exam 2 (Semester work)	-	-	-
3	Final Written Exam	Week5	60	60%
4	Final Practical /Clinical/... Exam	Week14	25	25%
5	Final Oral Exam	-	-	-
6	Activity (report)	Week7,9		
7	Assignment (formative assessment)	Week4,12	-	-
	Other (Mention)	-	-	-

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

7. Learning Resources and Supportive Facilities *

Learning resources (books, scientific references, etc.) *	The main (essential) reference for the course (must be written in full according to the scientific documentation method)	Course Notes: Student e-book of professional practice approved by pharmacy practice department (2025-2026)
	Other References	- Professional Practice Standards 2023 Version 6 - Problem solving skills and clinical decision making among nursing interns, International Journal of Novel Research in Healthcare and Nursing Vol. 8, Issue 1, pp: (304-309), Month: January - April 2021, Available at: www.noveltyjournals.com - A vision for pharmacy professional practice in England, report authors: Catherine Picton, Ravi Sharma, Richard Murray, commissioned by: English Pharmacy Board, Royal Pharmaceutical Society - FastTrack, Law and Ethics in Pharmacy Practice. By: Ruth Rodgers, Catherine Dewsbury, Andrew Lea. Pharmaceutical Press London Chicago - Decision-Making and Problem-Solving Approaches in Pharmacy Education, American Journal of Pharmaceutical Education 2016; 80 (3) Article 52. - Ethics and the pharmacist: Privacy and confidentiality FIP Community Pharmacy Section 2023, Copyright 2023 International Pharmaceutical Federation (FIP) https://www.fip.org/file/5591 - FIP STATEMENT OF PROFESSIONAL STANDARDS Codes of ethics for pharmacists https://www.fip.org/file/1586 - A Framework for Ethical Decision-Making, PHARMACY CONNECTION ~ SPRING 2017 ~ PAGE 37 https://www.ocpinfo.com/library/pharmacy-connection/download/OCP_PharmacyConnection_Spring2017_Ethical_Decision_Making.pdf
	Electronic Sources (Links must be added)	www.ekb.eg www.Pubmed.com www.Sciencedirect.com
	Learning Platforms	https://shortul.at/sar8D

	(Links must be added)	
	Other (to be mentioned)	-
Supportive facilities & equipment for teaching and learning *	Devices/Instruments	Computer, board
	Supplies	
	Electronic Programs	3. Microsoft office 4. 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. Shereen Sabry

**Name and Signature
Head of department**

Asst. Prof Dr. Esraa Zakaria