

Course Description Form

1. Course Name:	
Pharmacy ethics	
2. Course Code:	
PH3206	
3. Semester / Year:	
Second semester/ Third level	
4. Description Preparation Date:	
2025-2026	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
15h / 1 unit	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Fahmi Yahya Ahmed Email: Fahmi.yahya@alayen.edu.iq	
8. Course Objectives	
Course Objectives	1. Enabling the student to understand the basic concepts of ethics, which formulate the pharmacist's relationship with the patient, colleagues, and other health workers in order to provide his pharmaceutical services in a good manner. 2. To enable the student to explain the ethical principles of autonomy, non-maleficence, beneficence, justice, fidelity, confidentiality, honesty and accountability as they relate to the practice of pharmacy. 3. To enable the student to understand the importance of each ethical principle in guiding professional behavior and decision-making in pharmacy settings. 4. To enable the student to identify real-world scenarios where these ethical principles can come into play and apply them appropriately to resolve ethical dilemmas in pharmacy practice. 5. To enable the student to demonstrate ethical thinking skills by analyzing case studies and formulating ethical solutions that support the principles of autonomy, non-maleficence, benevolence, justice, sincerity, confidentiality, honesty and accountability in the context of pharmacy practice.
9. Teaching and Learning Strategies	
Strategy	1- Whiteboard, multimedia lectures, power point presentation 2- Class discussion 3- Presentation of cases of ethical dilemmas 4- Handouts 5- Brainstorming 6- Problem solving
10. Course Structure	

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	1	This lecture aims to enable students to understand the historical background and fundamental concepts of ethics in pharmacy practice and recognize the importance of ethical principles in professional decision-making.	Introduction to Pharmacy Ethics (Theoretical considerations).	1- Whiteboard, multimedia lectures, power point presentation 2- Class discussion 3- Presentation of cases of ethical dilemmas 4- Handouts 5- Brainstorming 6- Problem solving	1- Short MCQs 2- Oral exam and direct questions in the class 3- Midterm exam 4- Electronic exams on the electronic platform 5- Final exam 6. Reports and Assignments
2	1	This lecture focuses on developing students' understanding of the principles and standards outlined in the professional code of ethics and their application in daily pharmacy practice.	Code of Ethics for Pharmacists		
3/4/5	3	This lecture aims to familiarize students with core ethical principles such as beneficence, autonomy, honesty, informed consent, confidentiality, and fidelity, and their relevance to pharmaceutical care practice.	Common Ethical Considerations in Pharmaceutical Care Practice (Beneficence, Autonomy, Honesty, Informed Consent, Confidentiality, Fidelity).		
6/7	2	This lecture aims to develop students' ability to build and maintain ethical and respectful interprofessional relationships to support collaborative patient care.	Interprofessional Relations.		
8	1	This lecture focuses on enhancing students' skills in ethical decision-making by applying structured approaches to resolve	Making ethical decisions		

		ethical dilemmas in pharmacy practice.			
9	1	This lecture aims to enable students to understand the role of ethics in clinical research, including ethical responsibilities before and during the conduct of research involving human subjects.	Ethical issues related to clinical pharmacy research.		
10	1	This lecture aims to enable students to understand the role of ethics in clinical research, including ethical responsibilities before and during the conduct of research involving human subjects.	Ethical problems in pharmacist's clinical practice.		
11	1	This lecture prepares students to recognize medication misuse and abuse, understand their consequences, and apply ethical principles in prevention and management strategies.	Preventing misuse of medicines.		
12/13/ 14/15	4	This lecture aims to strengthen students' ability to apply ethical principles to real clinical scenarios and analyze ethical dilemmas encountered in pharmacy practice.	Case studies in pharmacy ethics.		

11. Course Evaluation

20% Midterm exam, 10% (Quizzes, attendance, active participation in class, assignment), 70% final

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1-Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide, 3rd Edition. 2- Robert m. Veatch and Amy Haddad. C Studies in Pharmacy Ethics.
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	Third edition. Copyright © 2008 by Oxford University Press, Inc
Main references (sources)	1-Robert J. Cipolle, Linda M. Strand, Peter C. Morley. Pharmaceutical Care Practice: The Clinician's Guide, 3rd Edition.
Recommended books and references (scientific journals, reports...)	1. Course Notes: Medical Law and Ethics. 2. Compelling Ethical Challenges in Critical Care and Emergency Medicine.
Electronic References, Websites	

Course Description Form

1. Course Name:	
Inorganic pharmaceutical chemistry	
2. Course Code:	
PH3101	
3. Semester / Year:	
First semester / third level	
4. Description Preparation Date:	
2025-2026	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2x15= 45 hrs. (theoretical) 2x15=30 hrs. (practical) /number of units = 4	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Mohamed Mohamed Shahin Email: MohamedShahin.pharm@gmail.com	
8. Course Objectives	
Course Objectives	- This course examines the clinical application of inorganic compounds, focusing on the relationship between chemical structure and therapeutic or diagnostic function. - Students will study the roles of key metals in medicine, including platinum anticancer agents and chelation therapy. - A significant component is dedicated to radiopharmacy, covering the principles, safe handling, and application of radiopharmaceuticals in advanced medical imaging and treatment.
9. Teaching and Learning Strategies	
Strategy	1-lectures included multimedia lectures 2- power point presentation 3- practical work

- 4– open discussion
- 5– class activity
- 6–Self learning
- 7– Quizzes and assignments

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	2	1. Identify the electron configurations of lithium, sodium, and potassium. 2. Describe the basic chemical properties of these metals. 3. Explain how lithium is used in medicine and its pros and cons. 4. Understand why sodium is important for the human body. 5. Describe how sodium ions move in and out of cells (active transport). 6. Discuss the effects of sodium in food, medicine, and health. 7. Recognize the role of potassium in the body and its medical uses.	Alkali Metals: Lithium, Sodium, Potassium: Electron configuration, chemical properties of metals, Advantages and disadvantages using lithium-based drugs, Sodium as an essential ion in the human body, Active transport of sodium ions, Drugs, diet and toxicity of sodium ions, Potassium and its clinical application.	1–lectures included multimedia lectures 2– power point presentation 3– open discussion 5– class activity 6–Self learning	1–written exam 2– Quiz 3–midterm exam 4– final exam
2	2	1. Identify the electron configurations of magnesium and calcium. 2. Describe the basic	Alkaline Earth Metals: Magnesium, Calcium: Electron configuration of metals, Major uses		

		chemical properties and common uses of these metals. 3. Explain the biological importance of magnesium in the human body. 4. List some clinical uses and pharmaceutical preparations of magnesium. 5. Understand the essential role of calcium in body functions like bones, muscles, and nerves.	and Chemical properties, Magnesium Biological importance and clinical applications and preparations. Calcium: the key to many human functions.		
3,4	4	1. Describe the general chemical properties of Group 13 elements. 2. Explain the pharmaceutical uses of boric acid and the drug bortezomib. 3. Understand the biological role of aluminum and its use in adjuvants and antacids. 4. List aluminum-based drugs used as phosphate binders and antiperspirants. 5. Introduce the element gallium, its chemistry, and its medical	Group 13: Aluminum, Boron and Gallium: General chemistry of group 13 elements, Pharmaceutical applications of boric acid, Bortezomib, Biological importance of Aluminium and its adjuvants, Antacids, Aluminum-based therapeutics, Phosphate binders, Antiperspirant. Gallium Introduction, Chemistry, Pharmacology of gallium-based drugs		

		applications. 6. Identify the pharmacological uses of gallium-based drugs in clinical settings.	and their uses		
5	2	1. Describe the general chemical properties of Group 14 elements. 2. Compare silicon-based drugs with carbon-based analogues in terms of structure and function. 3. Recognize common silicon-containing groups used in medicinal chemistry. 4. Understand the concept of silicon isosters and their role in drug design. 5. Identify examples and uses of organosilicon drugs in clinical practice.	The Carbon Group: General chemistry of group 14 elements, Silicon-based drugs versus carbon-based analogues, Introduction of silicon groups, Silicon isosters, Organosilicon drugs.		
6,7	4	1. Identify the electronic configurations of key d-block elements. 2. Describe the role of platinum compounds in cancer treatment. 3. Explain the biological importance and clinical uses of iron. 4. Recognize the medical	Transition Metals and d-Block Metal Chemistry: Electronic configurations, platinum anticancer agents, Iron and its role in biological systems, clinical applications. Copper-containing drugs,		

		applications of copper-containing drugs. 5. Discuss the potential of silver as an antimicrobial agent. 6. Understand how gold compounds are used to treat rheumatoid arthritis. 7. Describe the role of zinc in the body, its medical uses, and possible toxicity.	Silver: the future of antimicrobial agents?, Gold: the fight against rheumatoid arthritis and zinc and its role in biological systems, clinical applications and toxicity.		
8	2	1. Define what heavy-metal poisoning is and its common causes. 2. Explain the concept of chelation and how it works in the body. 3. Describe the purpose and process of chelation therapy. 4. Identify key chelating agents such as: –Calcium disodium edetate, Dimercaprol (BAL) and DMSA 5. Understand the clinical uses and differences between these chelating agents.	Chelation Therapy: What is heavy-metal poisoning? What is chelation? Chelation therapy, Calcium disodium edetate, Dimercaprol (BAL), Dimercaptosuccinic acid (DMSA), 2,3-Dimercapto-1-propanesulfonic acid (DMPS), and Lipoic acid (ALA).		
9	2	1. Define what protective adsorbents are and how	Protective adsorbents		

		they work. 2. Identify common examples of protective adsorbents used in medicine. 3. Explain how adsorbents protect the gastrointestinal tract from toxins and irritants. 4. Describe the clinical uses of substances like activated charcoal, kaolin, and attapulgite. 5. Understand the role of adsorbents in treating poisoning, diarrhea, and gastric discomfort.			
10	2	1. Define what topical agents are and how they are applied. 2. Identify different types of topical agents (e.g., antiseptics, emollients, corticosteroids). 3. Explain the general uses of topical agents in treating skin and mucosal conditions.	Topical agents		
11	2	1. Define what dental agents are and their general purpose. 2. Identify common types of dental agents (e.g.,	Dental agents		

		fluoride, antiseptics, desensitizing agents). 3. Explain how dental agents help in preventing and treating oral diseases. 4. Describe the role of fluoride in protecting teeth from decay. 5. Recognize the clinical uses of dental agents in oral hygiene and dental procedures.			
12	2	1. Define organometallic chemistry and explain what metallocenes are. 2. Describe the structure and properties of ferrocene and its medical potential. 3. Explain how ferrocene derivatives may be used to treat malaria and breast cancer. 4. Identify the role of titanocenes as titanium-based anticancer agents. 5. Describe the use of vanadocene dichloride and other vanadium-based drugs in cancer therapy. 6. Understand how some vanadium compounds act	Organometallic Chemistry: What is organometallic chemistry and metallocenes? Ferrocene derivatives as potential antimalarial agent and antibreast cancer, Titanocenes in titanium-based anticancer agents and Vanadocene dichloride as anticancer agents, Further vanadium-based drugs: insulin mimetics.		

		as insulin mimetics in diabetes research.			
13,14	4	1. Define radioactive compounds and their role in medicine. 2. Explain the basic principles of radiopharmacy and safe handling of radiopharmaceuticals. 3. Identify common therapeutic uses of radiopharmaceuticals (e.g., cancer treatment, thyroid disorders). 4. Describe the procedures for dispensing radioactive drugs safely. 5. Understand the importance of radiation protection for patients and healthcare workers.	Radioactive Compounds and Their Clinical Application, Radiopharmacy: dispensing and protection, Therapeutic use of radiopharmaceuticals.		
15	2	1. Define radiopharmaceuticals and their role in medical imaging. 2. Identify common imaging techniques that use radiopharmaceuticals (e.g., PET, SPECT). 3. Explain how radiopharmaceuticals help visualize organs and detect	Radiopharmaceuticals for imaging		

		diseases. 4. List examples of radiotracers used in diagnostic imaging (e.g., technetium-99m, fluorodeoxyglucose). 5. Understand the safety and handling considerations for imaging radiopharmaceuticals.			
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11. Course Evaluation

Written exam 60 marks
 Midterm 15 marks
 Practical exam 10 marks
 Collective Theo practical exam 5 marks
 Course work 10 marks
 Total =100 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Inorganic Medicinal and Pharmaceutical Chemistry by Block, Roche Soine and Wilson, latest edition
Main references (sources)	Essentials of Inorganic Chemistry For Students of Pharmacy, Pharmaceutical Sciences and Medicinal Chemistry by KATJA A. STROHFELDT, School of Pharmacy, University of Reading, UK
Recommended books and references (scientific journals, reports...)	Inorganic chemical acta and Coordinat Chemistry Reviews
Electronic References, Websites	Inorganic Chemistry Research (Inorg. Chem. Res.)

Course Description Form

1. Course Name:	
Organic pharmaceutical chemistry I	
2. Course Code:	
PH3201	
3. Semester / Year:	
Second semester / third level	
4. Description Preparation Date:	
2025-2026	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3x15= 45 hrs (theoretical) 2x15=30 hrs (practical) /number of units = 4	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ranza Ahmed Abdo Hassan Elrayess Email: Ranza.Ahmed@alayen.edu.iq	
8. Course Objectives	
Course Objectives	• This course aims to provide students with a comprehensive understanding of the principles governing drug distribution, acid-base properties, and drug-receptor interactions. • It focuses on the application of QSAR models, molecular modeling, and statistical methods to predict pharmacological activity and analyze structure-activity relationships. Additionally, the course covers drug metabolism pathways and the factors affecting them to support rational drug design and optimization.
9. Teaching and Learning Strategies	

Strategy		1–lectures included multimedia lectures 2– power point presentation 3– practical work 4– open discussion 5– class activity 6–Self learning			
10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Students will be able to explain the factors influencing drug distribution and their impact on drug efficacy and safety	Drug distribution.	1–lectures included multimedia lectures 2– power point presentation 3– open discussion 5– class activity 6–Self learning	1–written exam 2– Quiz 3–midterm exam 4– final exam
2.	3	Students will be able to analyze the acid–base properties of drugs and their role in drug absorption and distribution	Acid– base properties.		
3.	3	Students will be able to apply basic statistical methods to predict pharmacological activity of drug molecules.	Statistical prediction of pharmacological activity.		
4	3	students will be able to interpret and construct QSAR models to correlate	QSAR models.		

		chemical structure with biological activity			
5.	3	Students will be able to use molecular modeling techniques to support computer-aided drug design and optimization.	Molecular modeling (Computer aided drug design.)		
6	3	Students will be able to describe the types of forces involved in drug-receptor interactions.	Drug receptor interaction: force involved.		
7	3	students will be able to evaluate the effect of steric features on drug-receptor binding and biological activity.	Steric features of drugs.		
8	3	students will be able to assess the influence of optical isomerism and molecular conformation on biological activity	Optical isomerism and biological activity. Calculated conformation.		
9	3	Students will be able to apply 3D-QSAR techniques and utilize databases in drug design studies.	Three- dimensional quantitative structure activity relationships and databases.		

10	3	Students will be able to explain the concept of isosterism and its role in modifying drug–receptor interactions	Isosterism, Drug receptor interaction and subsequent		
11	3	Students will be able to describe the basic principles and phases of drug metabolism	Drug Metabolism–I		
12	3	students will be able to explain Phase I metabolic reactions and their effects on drug activity.	Drug Metabolism–II		
13	3	Students will be able to explain Phase II metabolic reactions and their role in drug elimination	Drug Metabolism–III		
14	3	Students will be able to analyze metabolic pathways and their clinical significance	Drug Metabolism–IV		
15	3	Students will be able to identify and discuss the biological and chemical factors affecting drug metabolism	Factor affecting on Drug Metabolism–		
11. Course Evaluation					
Written exam 60 marks					

Midterm 15 marks

Practical 25 marks

Total = 100 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12th ed, 2011.
Main references (sources)	Wilson and Gisvold Textbook of Organic medicinal and Pharmaceutical chemistry, Delgado JN, Remers WA, (Eds); 12th ed, 2011.
Recommended books and references (scientific journals, reports...)	Scientific journals in basic specializations
Electronic References, Websites	Websites of Arab and foreign universities and pharmaceutical companies

Course Description Form

1.Course Name:	
Pathophysiology	
2.Course Code:	
PH3105	
3.Semester / Year:	
First semester /Third year	
4.Description Preparation Date:	
2025-2026	
5.Available Attendance Forms:	
Full-time and official attendance hours	
6.Number of Credit Hours (Total) / Number of Units (Total)	
3x15= 45 hrs (theoretical) 2x15=30 hrs (practical) /number of units = 4	
7.Course administrator's name (mention all, if more than one name)	
Name: Karema mohamed Abuelfotouh soliman Email: Karema.mohammed@alayen.edu.eg	
8.Course Objectives	
Course Objectives	1. Identify the mechanism of disease occurrence from the physiological perspective of the human body. 2. Identify the pathological effects during the occurrence of the disease and after recovery from it. 3. Identify the clinical symptoms of the disease.
9.Teaching and Learning Strategies	
Strategy	- PowerPoint and Multimedia presentation - Class discussion. - Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams

- **PowerPoint Presentations:** Visually rich presentations with diagrams, flowcharts, and clinical correlations.
- **Case Studies and Clinical Scenarios:** Used to integrate theoretical knowledge with clinical applications.
- **Whiteboard and Visual Aids:** For step-by-step explanation of mechanisms and disease pathways.
- **Virtual Simulations:** Digital tools and simulations to demonstrate physiological and pathological changes.
- **Assessment Tools:** MCQs, short answer questions, and assignments aligned with course learning outcomes.
- **Reference Guidelines:** Basic clinical and diagnostic guidelines to support understanding of disease relevance.

10.Course Structure

1. Course Structure (Theory)

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understand the basic concepts and scope of pathophysiology and its relationship to disease development. They will explain how normal physiological processes are altered in disease states.	Introduction to pathophysiology	smartboard/ Presentation slides/ discussion	oral questions and written exams
2	3	Describe the causes and mechanisms of cell injury and cellular adaptation. They will differentiate between reversible degeneration and irreversible cell death (necrosis).	Cell injury and tissue response; Degeneration; Necrosis.	smartboard/ Presentation slides/ discussion	oral questions and written exams
3	3	Explain the mechanisms, mediators, and stages of acute and chronic inflammation. They will correlate inflammatory responses with clinical signs and disease progression.	Inflammation (acute and chronic inflammation)	smartboard/ Presentation slides/ discussion	oral questions and written exams
4	3	Explain the pathophysiology of fluid, electrolyte, and acid-base balance	Syndrome of inappropriate	smartboard/ Presentation	oral questions

		disorders. They will differentiate between metabolic and respiratory disturbances based on underlying mechanisms.	secretion of ADH; Diabetes insipidus; Metabolic acidosis and alkalosis; Respiratory acidosis and alkalosis.	slides/ discussion	and written exams
5	3	Describe the etiopathogenesis and pathophysiological changes in major cardiac diseases. They will relate structural and functional abnormalities of the heart to clinical manifestations.	MI; Rheumatic heart disease; Heart failure.	smartboard/ Presentation slides/ discussion	oral questions and written exams
6	3	Explain the pathophysiology of obstructive and vascular lung diseases. They will correlate pathological changes in the respiratory system with impaired gas exchange.	Emphysema and bronchiectasis; Cystic fibrosis; Pulmonary embolism; Pulmonary hypertension.	smartboard/ Presentation slides/ discussion	oral questions and written exams
7	3	Describe the mechanisms of renal injury and progression of kidney diseases. They will distinguish between acute and chronic renal failure based on pathophysiology and outcomes.	Hypertensive glomerular disease; Pyelonephritis; Drug related nephropathies; Acute renal failure; Chronic renal failure.	smartboard/ Presentation slides/ discussion	oral questions and written exams
8	3	Explain the pathophysiological mechanisms underlying functional and	Irritable bowel syndrome. Crohn's disease; Diarrhea; Celiac disease.	smartboard/ Presentation slides/ discussion	oral questions and written exams

		inflammatory gastrointestinal disorders. They will relate intestinal dysfunction to clinical symptoms and complications.			
9	3	Explain the autoimmune basis and pathophysiology of Graves' disease. They will relate excess thyroid hormone production to systemic clinical manifestations.	Graves's disease	smartboard/ Presentation slides/ discussion	oral questions and written exams
10	3	Describe the causes and mechanisms leading to thyrotoxicosis. They will explain the physiological effects of elevated thyroid hormones on body systems.	Thyrotoxicosis	smartboard/ Presentation slides/ discussion	oral questions and written exams
11	3	Explain the pathophysiology of insulin resistance and impaired glucose metabolism. They will relate metabolic abnormalities to long-term complications of diabetes.	Diabetes mellitus and metabolic syndrome	smartboard/ Presentation Slides /discussion	oral questions and written exams
12	3	Describe the metabolic disorders affecting bone density and mineralization. They will differentiate between osteoporosis and osteomalacia/rickets based on underlying mechanisms.	Metabolic and rheumatic disorders of skeletal system: Osteoporosis; Osteomalacia and rickets.	smartboard/ Presentation slides/ discussion	oral questions and written exams
13	3	Explain the inflammatory and degenerative mechanisms involved in common joint disorders. They will relate joint pathology to pain,	Ankylosing spondylitis Gout; Osteoarthritis syndrome.	smartboard/ Presentation Slides /discussion	oral questions and written exams

		stiffness, and loss of mobility.			
14	3	Classify the types of hypersensitivity reactions and explain their mechanisms. They will correlate immune-mediated tissue damage with clinical presentations.	Alteration in immune response: Hypersensitivity disorders.	smartboard/ Presentation slides/ discussion	oral questions and written exams
15	3	Explain the causes and pathophysiology of primary and secondary immunodeficiency disorders. They will relate impaired immune function to increased susceptibility to infections.	Immunodeficiency disorders.	smartboard/ Presentation slides/ discussion	oral questions and written exams

11.Course Evaluation

Midterm Exam 15 marks

Quizzes and activities 5 marks

Practical 20 marks

Final Exam 60 marks

12.Learning and Teaching Resources

Required textbooks (curricular books, if any)	1– Carol M. Porth (2011). Essentials of Pathophysiology: Concepts of Altered Health States. 3 rd Edition. Lippincott Williams & Wilkins.
Main references (sources)	1– Jacquelyn L. Banasik and Lee-ellen C. Copstead (2019). Pathophysiology. 6 th Edition. Elsevier Inc.
Recommended books and references (scientific journals, reports...)	1– Lachel Story (2018). Pathophysiology: a Practical Approach. Jones & Bartlett Learning. 2– Barbara E. Gould and Ruthanna Dyer (2011). Pathophysiology for The Health Professions. 4 th Edition. Elsevier Inc. 3– Julie Munden (2007). Pathophysiology (Lippincott manual of nursing practice series). Lippincott Williams & Wilkins.
Electronic References, Websites	



ALAYEN IRAQI
UNIVERSITY

Course Description Form

1. Course Name:	
Pharmaceutical and Cosmetic Preparations	
2. Course Code:	
PH3203	
3. Semester / Year:	
Second semester/ third year	
4. Description Preparation Date:	
2026-2025	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours/week (theoretical), 2 hours/week (practical), total units = 4	
7. Course administrator's name (mention all, if more than one name)	
Name: Associated prof. Dr. Mohammed Sherif saddik Ibrahim	
Email: Sherif@alayen.edu.iq	
8. Course Objectives	
Course Objectives	1) Understand the principles, preparation, and stability of pharmaceutical emulsions, including surfactant systems and microemulsions. 2) Study the formulation, compounding, and use of semisolid dosage forms such as ointments, creams, gels, and dermatologic preparations. 3) Explore the design and clinical applications of suppositories, vaginal inserts, and medication sticks, including manufacturing and quality control. 4) Learn the physicochemical and therapeutic considerations for selecting appropriate bases and packaging for topical and rectal formulations. 5) Examine the formulation strategies and clinical uses of cosmetic products including sunscreens, exfoliants, and anti-aging preparations. 6) Apply knowledge of formulation science to ensure safety, effectiveness, and patient acceptability of pharmaceutical and cosmetic products
9. Teaching and Learning Strategies	
Strategy	1- Lectures

	2– Class discussion 3– Quizzes 4–Reports				
10. Course Structure (Theory)					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Explain the concept, types and pharmaceutical importance of emulsions. Identify the methods used in preparation of emulsions.	Emulsions: An introduction to emulsions and their preparation methods	smartboard/ Presentation slides/ discussion	oral questions and written exams
2	3	Classify emulsifying agents based on source and mechanism of action. Select suitable emulsifiers for different emulsion systems.	Emulsions: Types of emulsifying agents	smartboard/ Presentation slides/ discussion	oral questions and written exams
3	3	Describe traditional and modern emulsion preparation methods. Apply appropriate techniques to ensure emulsion stability.	Methods of emulsion preparation	smartboard/ Presentation slides/ discussion	oral questions and written exams
4	3	Differentiate between ointments, creams, and pastes. Select suitable semisolid dosage forms for topical use.	Semisolid dosage form: Ointments, creams and pastes	smartboard/ Presentation slides/ discussion	oral questions and written exams
5	3	Classify different types of ointment bases. Choose appropriate bases according to drug and therapeutic needs.	Semisolid dosage form: Types of ointment bases	smartboard/ Presentation slides/ discussion	oral questions and written exams

6	3	Describe specific requirements of ophthalmic ointments. Explain factors affecting safety effectiveness.	Properties of ophthalmic ointments	smartboard/ Presentation slides/ discussion	oral questions and written exams
7	3	Classify different types of suppository bases. Explain their influence on drug release and stability.	Suppositories base types	smartboard/ Presentation slides/ discussion	oral questions and written exams
8	3	Describe fusion compression methods of suppository preparation. Apply displacement volume calculations accurately.	Preparation of Suppositories	smartboard/ Presentation slides/ discussion	oral questions and written exams
9	3	Explain suitable packaging materials and storage conditions for suppositories. Evaluate factors affecting the physical and chemical stability of suppository formulations.	Packaging and storage & Stability	smartboard/ Presentation slides/ discussion	oral questions and written exams
10	3	Identify physical, chemical, and therapeutic incompatibilities. Propose methods to prevent or resolve incompatibilities	Incompatibilities: Identification of physical, chemical and therapeutic incompatibilities	smartboard/ Presentation slides/ discussion	oral questions and written exams
11	3	Explain principles of cosmetic formulation for skin care products. Identify main ingredients and their functions.	Cosmetic Formulations Introduction & Cosmetic formulation of skin care products	smartboard/ Presentation slides/ discussion	oral questions and written exams

12	3	Describe composition purpose of toners astringents. Differentiate between deodorants antiperspirants.	Toners and astringents & Antiperspirants	smartboard/ Presentation slides/ discussion	oral questions and written exams
13	3	Classify sunscreens explain their mechanism action. Interpret SPF value and photoprotection claim.	Sunscreens	smartboard/ Presentation slides/ discussion	oral questions and written exams
14	3	Identify causes of aging and anti-aging agents. Explain formulation approaches for anti-aging products.	Anti-aging skin care formulations	smartboard/ Presentation slides/ discussion	oral questions and written exams
15	3	Explain clinical effects of topical exfoliation. Identify key formulation considerations for safety and efficacy.	Topical exfoliation— clinical effects and formulating considerations	smartboard/ Presentation slides/ discussion	oral questions and written exams

11. Course Evaluation

Mid term Exam 15 marks
 Quizzes and activities 5 marks
 Practical 20 marks
 Final Exam 60 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)

1-Pharmaceutical dosage forms and drug delivery systems by Haward A. Ansel; 11th edition, 2017. Lippincott Williams & Wilkins, a Wolters Kluwer business

	2. Sprewell's American pharmacy.
Main references (sources)	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3rd ed. Michael E. Aulton (Author) Churchill
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Main references (sources)	1–Indian Pharmacopoeia, Egyptian Pharmacopoeia. 2–De Smet, P.A., Keller, K., Hausel, R. and Chandler, R.F., “Adverse effects of herbal drugs”, Springer Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong, Vol. I (1993). 3–Weiss R.F. and Fintelmann V. “ Herbal Medicine”, Thieme, Stuttgart, New York, 2nd Ed. (2000).
Recommended books and references (scientific journals, reports...)	Scientific journals in basic specializations
Electronic References, Websites	Websites of Arab and foreign universities and pharmaceutical companies

Course Description Form

1. Course Name:	
Pharmaceutical technology I	
2. Course Code:	
PH3103	
3. Semester / Year:	
1 st semester/ 3 rd year	
4. Description Preparation Date:	
2025-2026	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours/week (theoretical), 2 hours/week (practical), total units = 4	
7. Course administrator's name (mention all, if more than one name)	
Name: 1-Associated prof. Dr. Mohammed Sherif saddik Ibrahim 2-Assist. Lecturer Mays Mazin AL-Hamadanl Email: 1-Sherif@alayen.edu.iq 2-Mais.yahya@alayen.edu.iq	
8. Course Objectives	
Course Objectives	The use of pharmacy technology in pharmacy includes methods of preparing and detecting different drug forms, calculations of medicinal preparations in addition to identifying the physiochemical properties of pharmaceutical substances and methods of dealing with them
9. Teaching and Learning Strategies	
Strategy	1- Lectures 2- Class discussion 3- practical work 3- Quizzes 4-Reports
10. Expected learning outcomes	

11. Course Structure (Theory)					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Analyze the physical and chemical properties of active pharmaceutical ingredients (APIs) and their impact on dosage form design and stability	Pharmaceutical preformulation	smartboard/ Presentation slides/ discussion	oral questions and written exams
2	3	Define pharmaceutical solutions and classify them based on the nature of solutes, solvents, and concentration.	Official solutions; classification of official solutions; preparation and uses	smartboard/ Presentation slides/ discussion	oral questions and written exams
3	3	Explain factors affecting solubility, differentiate between solubility and rate of solution,	Aqueous solutions containing aromatic principles; aromatic waters;	smartboard/ Presentation slides/ discussion	oral questions and written exams

		and master the preparation of solutions containing non-volatile substances.	methods of preparations; stability		
4	3	Compare sugar-based syrups and non-sugar alternatives (e.g., Sorbitol), while evaluating their preparation techniques and physicochemical stability	Syrups: sugar based syrups; artificial and sorbitol based syrups; stability of syrups	smartboard/ Presentation slides/ discussion	oral questions and written exams
5	3	Spirits and Elixirs): Comprehend the mechanisms of preparing Spirits and Elixirs using mixed solvent systems.	Preparation of solutions using mixed solvent systems; spirits, and elixirs	smartboard/ Presentation slides/ discussion	oral questions and written exams
6	3	Differentiate between various extraction methods,	Extraction; maceration and percolation.	smartboard/ Presentation slides/ discussion	oral questions and written exams

		specifically Maceration and Percolation.			
7	3	Describe the characteristics of tinctures, fluid extracts, solid extracts, and resins, understanding their scientific differences.	Tinctures; fluid extracts; extracts of resins and oleoresins.	smartboard/ Presentation slides/ discussion	oral questions and written exams
8	3	Describe the characteristics of tinctures, fluid extracts, solid extracts, and resins, understanding their scientific differences.	Identification of the constituents of Tinctures dosage form and its methods of preparation.	smartboard/ Presentation slides/ discussion	oral questions and written exams
9	3	Identify the components of pharmaceutical suspensions and understand the physical balance required for the stability of dispersed solid particles.	Coarse dispersion. suspensions.	smartboard/ Presentation slides/ discussion	oral questions and written exams

10	3	Identify the components of pharmaceutical suspensions and understand the physical balance required for the stability of dispersed solid particles.	Coarse dispersion.	smartboard/ Presentation slides/ discussion	oral questions and written exams
11	3	Identify the constituents of pharmaceutical suspensions and the methods used for their preparation.	Suspension: Identification of the constituents of suspension dosage form and its methods of preparation	smartboard/ Presentation Slides /discussion	oral questions and written exams
12	3	Classify types of sprays and understand their mechanisms of action and benefits for respiratory or topical drug delivery	Aerosol systems Aerosol container and valve assembly Metered-dose inhalers	smartboard/ Presentation slides/ discussion	oral questions and written exams
13	3	Explain the scientific principles of foam	Types of aerosols Advantages of the aerosol dosage form	smartboard/ Presentation Slides /discussion	oral questions and written

		preparation and their therapeutic advantages compared to conventional dosage forms.	The aerosol principle		exams
14	3	Distinguish between primary and secondary parenteral products and understand the rigorous manufacturing requirements, such as sterility and pyrogen-free standards	Parenterals dosage form Parenteral routes of administration Official types of injections Solvents vehicles for injections	smartboard/ Presentation slides/ discussion	oral questions and written exams
15	3	Distinguish between small and large volume parenterals and understand the requirements for pyrogen-free and sterile manufacturing	Small volume parenterals Large volume parenterals	smartboard/ Presentation slides/ discussion	oral questions and written exams
12. Course Evaluation					
Mid term Exam 15 marks					

Quizzes and activities 5 marks

Practical 20 marks

Final Exam 60 marks

13. Learning and Teaching Resources

Required textbooks (curricular books, if any)	1–Pharmaceutical dosage forms and drug delivery systems by Haward A. Ansel; 10th edition, 2015.Lippincott Williams & Wilkins, a Wolters Kluwer business 2. Sprowels American pharmacy.
Main references (sources)	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, 3rd ed. Michael E. Aulton (Author) Churchill
Recommended books and references (scientific journals, reports...)	
Electronic References, Websites	

Course Description Form

1. Course Name:	
Pharmacognosy II	
2. Course Code:	
PH3210	
3. Semester / Year:	
Third year / First semester	
4. Description Preparation Date:	
2026-2025	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours/week (theoretical), 2 hours/week (practical), total units = 3	
7. Course administrator's name (mention all, if more than one name)	
Name: Hussein hamed hayal Email: hussein.hamed@alayen.edu.iq	
8. Course Objectives	
Course Objectives	1- Understanding the scientific foundations and basic concepts of botany and plant application to pharmaceutical compounds. 2- Explaining the importance of studying the phytochemical reactions of chemical compounds in designing and developing drugs. 3- Introducing students to biological functional groups and analyzing their impact on the biological activity of drugs. 4- Providing students with the knowledge necessary to understand the Extraction methods.
9. Teaching and Learning Strategies	
Strategy	1-lectures included multimedia lectures 2- power point presentation 3- practical work 4- open discussion 5- class activity 6-Self learning

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understand the general biosynthetic pathways of secondary metabolites and recognize their types and significance in medicinal plants	Introduction: General biosynthesis pathways of secondary metabolites.	1–lectures included multimedia lectures 2– power point presentation	1–written exam 2– Quiz 3–midterm exam 4– final exam
2	3	Explain the biosynthesis of glycosides and their physical and chemical properties, including solubility, stability, and reactivity. Distinguish between major types of glycosides—cardiac, saponin, anthraquinone, flavonoid, and cyanophore glycosides—describing their chemical structures, biological activities, and therapeutic uses.	Glycosides: Biosynthesis, physical and chemical properties; cardiac glycosides; saponin glycosides; anthraquinone glycosides; flavonoid glycosides; cyanophore glycosides.	3– open discussion 5– class activity 6–Self learning	
3	3	Identify and describe different types of glycosides—isothiocyanate, aldehyde, alcoholic, phenolic, lactone, coumarins, and chromones—explaining their chemical structures, biosynthesis, properties, and pharmacological significance	Glycosides: Isothiocyanate glycosides; aldehyde glycosides; alcoholic glycosides; phenolic glycosides; lactone glycosides; coumarins and chromones		
4	3	Explain the chemical composition, classification,	Resins and resin combination; tannins		

		and properties of resins, resin combinations, and tannins, and describe their therapeutic uses and pharmacological effects			
5	3	Describe the composition, physical and chemical properties of lipids, including fixed oils and waxes, and explain their sources, extraction methods, and pharmaceutical or therapeutic applications.	Lipids: fixed oils and waxes.		
6	3	Understand the basic concepts and chemistry of volatile oils, including their composition, extraction methods, and pharmacological properties	Volatile oils: Introduction; chemistry of volatile oils;		
7	3	Explain the occurrence, chemical structure, and properties of ketones as components of volatile oils, and describe their biological activities and therapeutic applications	Ketones as volatile oils;		
8	3	Identify common non-medical toxic plants, describe their toxic constituents, mechanisms of toxicity, and potential health hazards, and understand basic safety and preventive measures.	Non- medicinal toxic plants.		
9	3	Describe the classification, chemical properties, sources, and physiological	Vitamins		

		roles of vitamins, and explain the consequences of their deficiency or excess on human health.			
10	3	Explain the occurrence, chemical structures, and properties of oxides and esters as components of volatile oils, and describe their pharmacological activities and therapeutic uses	Oxides as volatile oils; Ester as volatile oils;		
11	3	Describe the occurrence, chemical structures, and properties of hydrocarbons and alcohols as components of volatile oils, and explain their pharmacological activities and therapeutic applications.	hydrocarbons as volatile oils; alcohols as volatile oils		
12	3	Explain the occurrence, chemical structure, and properties of aldehydes as components of volatile oils, and describe their pharmacological activities and therapeutic uses	biosynthesis of volatile oils;; Aldehydes as volatile oils.		
13	3	Describe the occurrence, chemical structure, and properties of phenols in volatile oils, and explain their pharmacological effects and therapeutic applications.	Phenols as volatile oils;		
14	3	Explain the occurrence, chemical structure, and properties of phenolic	Phenolic ethers as volatile oils.		

		ethers in volatile oils, and describe their pharmacological activities and therapeutic uses.			
15	3	describe the structure, classification, and chemical properties of amino acids, and explain their biological roles, including protein synthesis and metabolic functions.	Amino acids		

11. Course Evaluation

Written exam 60 marks

Midterm 15 marks

Practical 25 marks

Total = 100 marks

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	Essential Books (Text Books) 1–Trease, G.E. and Evans, W.C. “Trease and Evans’ Pharmacognosy” WB Saunders Co. Ltd., London, Philadelphia, Toronto, Sydney, Tokyo (1994, 2005). 2– Wallis, T.A. “Textbook in Pharmacognosy” CBS publisher & Distributers, First Indian edition (1985). 3– Mahran, G.H., “Medicinal Plants” 1st Ed.(1967). 4–Saber, A.H., “Practical Pharmacognosy” El–Shaab Printing House, 4th Ed. (1966). 5–Jackson, B.P. and Snowdon D.W., “Atlas of microscopy of medicinal plants, herbs and spices” Belhaven Press, Printer Publishers, London. (1990).
Main references (sources)	1–Indian Pharmacopoeia, Egyptian Pharmacopoeia. 2–De Smet, P.A., Keller, K., Hausel, R. and Chandler, R.F., “Adverse effects of herbal drugs”, Springer Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong, Vol. I (1993).

	3-Weiss R.F. and Fintelmann V. “ Herbal Medicine”, Thieme, Stuttgart, New York, 2nd Ed. (2000).
Recommended books and references (scientific journals, reports...)	Scientific journals in basic specializations
Electronic References, Websites	Websites of Arab and foreign universities and pharmaceutical companies

Course Description Form

1. Course Name:	
Pharmacognosy III	
2. Course Code:	
PH3210	
3. Semester / Year:	
Third year / second semester	
4. Description Preparation Date:	
2025-2026	
5. Available Attendance Forms:	
Full-time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
2 hours/week (theoretical), 2 hours/week (practical), total units = 3	
7. Course administrator's name (mention all, if more than one name)	
Name: Hussein hamed hayal Email: hussein.hamed@alayen.edu.iq	
8. Course Objectives	
Course Objectives	1- Understanding the scientific foundations and basic concepts of botany and plant application to pharmaceutical compounds. 2- Explaining the importance of studying the phytochemical reactions of chemical compounds in designing and developing drugs. 3- Introducing students to biological functional groups and analyzing their impact on the biological activity of drugs. 4- Providing students with the knowledge necessary to understand the Extraction methods.
9. Teaching and Learning Strategies	
Strategy	1-lectures included multimedia lectures 2- power point presentation 3- practical work 4- open discussion 5- class activity 6-Self learning

10. Course Structure					
Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Understand the definition, general characteristics, classification, and biological significance of alkaloids, and recognize their therapeutic and toxicological importance	Alkaloids: Introduction	1–lectures included multimedia lectures 2– power point presentation 3– open discussion 5– class activity 6–Self learning	1–written exam 2– Quiz 3–midterm exam 4– final exam
2	3	Describe the physical and chemical properties of alkaloids, focusing on isoquinoline alkaloids, and explain their structural features, biosynthesis, and pharmacological activities	Physical and chemical properties of Alkaloids: iso-quinoline alkaloids;		
3	3	Describe the physical and chemical properties of quinoline, tropane, and pyridine alkaloids, and explain their structures, biosynthesis, pharmacological activities, and therapeutic applications	Quinoline tropan alkaloids pyridine,		
4	3	Explain the structure, chemical properties, biosynthesis, and pharmacological activities of indole alkaloids, highlighting their therapeutic uses and biological significance	Indole alkaloids.		
5	3	Describe the structure, chemical properties, biosynthesis, and biological activities of imidazole alkaloids, and explain their therapeutic applications and pharmacological significance.	imidazole alkaloids;		

6	3	Explain the structure, chemical properties, biosynthesis, and pharmacological activities of piperidine alkaloids, and describe their therapeutic uses and biological significance	piperidine alkaloids;		
7	3	Describe the structure, chemical properties, biosynthesis, and pharmacological activities of steroidal alkaloids, and explain their therapeutic applications and biological significance.	Alkaloids: Steroidal alkaloids;		
8	3	Explain the structure, chemical properties, biosynthesis, and pharmacological activities of amine and purine alkaloids, highlighting their therapeutic uses and biological significance.	alkaloidal amines; purine alkaloids.		
9	3	Describe the structure, chemical properties, biosynthesis, and pharmacological activities of lupinane alkaloids, and explain their therapeutic applications and biological significance.	lupinane alkaloids;		
10	3	Explain the structure, chemical properties, biosynthesis, and pharmacological activities of tropane alkaloids, and describe their therapeutic	tropane alkaloids		

		uses and biological significance.			
11	3	Identify the botanical characteristics, chemical constituents, and therapeutic uses of basil and peppermint, and explain their pharmacological activities and applications in medicine and aromatherapy.	basil, Peppermint,		
12	3	Understand the fundamentals and principles of phytotherapy, including the use of plant-based medicines, their mechanisms of action, therapeutic applications, and role in modern healthcare	phytotherapy :Introduction , principles,		
13	3	Describe the role and use of medicinal plants in selected healthcare systems, including their therapeutic applications, cultural significance, and integration into modern medicine	medicinal plants in selected health care systems		
14	3	Explain the importance of natural products in medicine and pharmacy, including their roles as therapeutic agents, sources of bioactive compounds, and contributions to drug discovery and development	Importance of natural products		
15	3	Describe the use of phytomedicines in pharmacy and medicine, including their therapeutic applications, active constituents,	phytomedicines used in pharmacy & medicine		

	mechanisms of action, and role in modern healthcare			
11. Course Evaluation Written exam 60 marks Midterm 15 marks Practical 25 marks Total = 100 marks				
12. Learning and Teaching Resources				
Required textbooks (curricular books, if any)	Essential Books (Text Books) 1–Trease, G.E. and Evans, W.C. “Trease and Evans’ Pharmacognosy” WB Saunders Co. Ltd., London, Philadelphia, Toronto, Sydney, Tokyo (1994, 2005). 2– Wallis, T.A. “Textbook in Pharmacognosy” CBS publisher & Distributers, First Indian edition (1985). 3– Mahran, G.H., “Medicinal Plants” 1st Ed.(1967). 4–Saber, A.H., “Practical Pharmacognosy” El-Shaab Printing House, 4th Ed. (1966). 5–Jackson, B.P. and Snowdon D.W., “Atlas of microscopy of medicinal plants, herbs and spices” Belhaven Press, Printer Publishers, London. (1990).			
Main references (sources)	1–Indian Pharmacopoeia, Egyptian Pharmacopoeia. 2–De Smet, P.A., Keller, K., Hausel, R. and Chandler, R.F., “Adverse effects of herbal drugs”, Springer Verlag, Berlin, Heidelberg, New York, London, Paris, Tokyo, Hong Kong, Vol. I (1993). 3–Weiss R.F. and Fintelmann V. “ Herbal Medicine”, Thieme, Stuttgart, New York, 2nd Ed. (2000).			

Recommended books and references (scientific journals, reports...)	Scientific journals in basic specializations
Electronic References, Websites	Websites of Arab and foreign universities and pharmaceutical companies

Course Description Form

1. Course Name:	
Pharmacology I	
2. Course Code:	
PH3202	
3. Semester / Year:	
Third year second semester 2024–2025	
4. Description Preparation Date:	
2025–2026	
5. Available Attendance Forms:	
Full–time and official attendance hours	
6. Number of Credit Hours (Total) / Number of Units (Total)	
3 hours x 15 weeks = 45 hrs. /3 units	
7. Course administrator's name (mention all, if more than one name)	
Name: Dr. Ahmed Atwa Email: ahmed-atwa@eru.edu.eg	
8. Course Objectives	
Course Objectives	1. The aims of the course are to provide students with general principles of pharmacology presented; such as pharmacokinetics, pharmacodynamics, receptor theory, drug interaction and principle of therapeutics. 2. This course also integrates principles of pharmacology with conceptual knowledge of physiology and pathophysiology to disease processes regarding the drugs acting on the autonomic nervous system as well as neuromuscular system. 3. The current course also enables the students to study principles of pharmacology of chemotherapeutic drugs (antimicrobials) with

	conceptual knowledge of physiology and pathophysiology disease processes regarding the infectious diseases as well as the basic principles of prophylactic use of drugs for the preventive care of both individual and community.
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9. Teaching and Learning Strategies

Strategy	1) Lectures included multimedia lectures 2) White board and Power point presentation 3) Open discussion 4) Class activity 5) Brain storming 6) Inverted class 7) Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams 8) Hybrid education
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3. Enhancing the spirit of cooperation and teamwork among students

4. Applying ethical theories, rules, guidelines and laws governing scientific conducts

10. Course Structure

Week	Hours	Required Learning Outcomes	Unit or subject name	Learning method	Evaluation method
1	3	Identify knowledge about advantages and disadvantages of different routes of administration and pharmacodynamics principles of the drugs.	General introduction to pharmacology	1) Lectures included multimedia lectures 2) White board and Power point presentation	1) Short MCQs 2) Oral exam and direct questions in the class
2	3	Identify basic principles of drug absorption, distribution, metabolism and excretion.	Pharmacokinetics	3) Open discussion	3) Midterm exam
3	3	Identify knowledge about pharmacodynamics	Drug receptor interaction and pharmacodynamics	4) Class activity 5) Brain storming	4) Electronic exams on the electronic platform

		principles of the drugs.		6) Inverted class	5) Final exam
4	3	Describe organization of the autonomic nervous system Differentiate between sympathetic and parasympathetic systems	Autonomic nervous system	7) Visual aids: Utilize visual aids such as pictures, charts, graphs, diagrams	
5	3	Identify drugs acting on the parasympathetic nervous system and their uses in various conditions	Cholinergic system	8) Hybrid education	
6	3	Describe drugs that reduce the parasympathetic nervous system activity in several diseases	Anticholinergic agents		
7	3	Identify drugs acting on the sympathetic nervous system and their uses in various conditions	Adrenergic system		
8	3	Describe mechanisms of action, therapeutic uses, and limitations of anticancer drugs. Recognize adverse effects, dose-limiting toxicities, and supportive care needs for antibiotics.	Principal of antimicrobial therapy		
9	3	Describe therapeutic uses, contraindications, and adverse effects of cell wall inhibitors.	B-lactam and other cell wall synthesis inhibitor antibiotics		
10	3	Describe therapeutic uses, contraindications,	Quinolones, folate antagonists and		

		and adverse effects of quinolones and folate antagonists.	urinary tract antiseptics		
11	3	Describe therapeutic uses, contraindications, and adverse effects of anti-T.B. drugs.	Antimycobacterium drugs		
12	3	Describe therapeutic uses, contraindications, and adverse effects of antifungal drugs.	Antifungal drugs		
13	3	Describe therapeutic uses, contraindications, and adverse effects of antiprotozoal drugs.	Antiprotozoal drugs		
14	3	Describe therapeutic uses, contraindications, and adverse effects of anthelmintic drgs.	Anthelmintic drugs		
15	3	Describe therapeutic uses, contraindications, and adverse effects of antiviral drugs.	Antiviral drugs		

11. Course Evaluation

Distributing the score out of 100 according to the tasks assigned to the student such as daily preparation, daily oral, monthly, or written exams, reports.... etc

12. Learning and Teaching Resources

Required textbooks (curricular books, if any)	○ Lippincott illustrated reviews in pharmacology, Karen Whalen, Wolters Kluwer, 8th edition
Main references (sources)	○ Lippincott illustrated reviews in pharmacology, Karen Whalen, Wolters Kluwer, 8th edition

Recommended books and references (scientific journals, reports...)	○ Katzung BG, Master SB, Trevor AJ: Basic & Clinical Pharmacology (Lange Basic science), McGraw–Hill Medical, London, 12th edition, 2016, 1264 pages. ○ Laurence LB, Bruce AC, Bjorn CK: GOODMAN & GILMAN'S, The Pharmacological Basis of Therapeutics, McGraw–Hill Medical, London, International edition, 2014. ○ Lippincott illustrated reviews in pharmacology, Karen Whalen, Wolters Kluwer ○ Rang and dale's pharmacology, El Sevier
Electronic References, Websites	○ Pubmed (www.ncbi.nlm.nih.gov/pmc/) ○ Sciencedirect (www.sciencedirect.com) ○ EKB (Egyptian knowledge bank) (www.ekb.eg)