

Planning and Quality Assurance Affairs

Form (A)

Course Specifications

General Information

Course name	General pharmacology
Course number	MDCN2313
Faculty	
Department	
Course type	Major Needs
Course level	2
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

- 1 - Understand the Principles of Pharmacology: Students should develop a solid understanding of the fundamental principles of pharmacology, including drug classification, mechanisms of drug action, pharmacokinetics, pharmacodynamics, and drug interactions
- 2 - Learn Drug Administration and Dosage Forms: Students should gain knowledge of different routes of drug administration and dosage forms, including oral, parenteral, topical, and inhalation routes. They should understand the factors affecting drug absorption, distribution, metabolism, and excretion
- 3 - Identify and Classify Drugs: Students should be able to identify and classify commonly used drugs based on their pharmacological properties, therapeutic uses, and adverse effects. They should understand the rationale behind drug classification systems
- 4 - Understand Drug-Receptor Interactions: Students should learn about drug-receptor interactions, including receptor binding, agonists, antagonists, and the concept of drug affinity and efficacy. They should be able to explain the mechanism of drug action at the molecular level
- 5 - Recognize Pharmacokinetic Parameters: Students should develop an understanding of pharmacokinetic parameters, including drug absorption, distribution, metabolism, and excretion. They should be able to calculate and interpret pharmacokinetic parameters such as half-life, clearance, and volume of distribution
- 6 - Understand Adverse Drug Reactions and Drug Safety: Students should learn about adverse drug reactions, including toxicities, allergies, idiosyncratic reactions, and drug-drug interactions. They should understand the importance of drug safety, adverse event reporting, and pharmacovigilance
- 7 - Pharmacotherapy and Therapeutic Decision-Making: Students should acquire skills in pharmacotherapy, including selecting appropriate drugs for specific disease states, individualizing drug therapy based on patient factors, and considering evidence-based guidelines and principles of rational drug use
- 8 - Evaluate Drug Literature and Clinical Trials: Students should develop skills in critically evaluating drug literature, including clinical trials, systematic reviews, and meta-analyses. They should understand the principles of evidence-based medicine and its application to pharmacological decision-making
- 9 - Ethical and Legal Considerations: Students should understand the ethical and legal aspects of pharmacology, including informed consent, off-label drug use, medication errors, drug marketing, and regulations governing drug development and approval

Intended Learning Outcomes

Knowledge and Understanding

- * Students should be able to classify drugs based on their pharmacological properties, such as mechanism of action, therapeutic uses, chemical structure, and pharmacokinetic profiles
- * Students should demonstrate an understanding of drug absorption, distribution, metabolism, and excretion. They should be able to explain factors influencing these processes and calculate pharmacokinetic parameters
- * Students should acquire knowledge of the mechanisms of drug action, including drug-receptor interactions, enzyme inhibition, and modulation of cellular signaling pathways. They should understand the relationship between drug concentration and pharmacological response
- * Students should learn about drug-drug interactions, drug-food interactions, and drug interactions with other substances. They should be able to identify potential interactions and their implications for drug therapy
- * Students should gain knowledge of pharmacogenetic principles, including genetic variations affecting drug metabolism, individualized drug therapy, and the impact of genetic testing on treatment decisions

Intellectual Skills

- * Students should acquire problem-solving skills in pharmacology, allowing them to identify and resolve medication-related problems, such as drug interactions, adverse drug reactions, and individualized therapy considerations. They should apply their knowledge to develop appropriate strategies for optimal drug therapy
- * Students should be able to interpret pharmacological data, including drug concentration-time profiles, pharmacokinetic parameters, and dose-response relationships. They should analyze and synthesize data to make informed decisions regarding drug dosing, regimen adjustments, and therapeutic monitoring
- * Students should develop skills in critically evaluating pharmacological literature, including research articles, systematic reviews, and drug monographs. They should assess the quality and relevance of the literature, identify biases, and draw valid conclusions based on the available evidence
- * Students should demonstrate clinical reasoning skills in pharmacology, integrating knowledge from pharmacokinetics, pharmacodynamics, and patient factors to make sound therapeutic decisions. They should be able to analyze patient-specific information and develop individualized drug therapy plans
- * Students should develop skills in identifying and managing medication-related risks, including adverse drug reactions, medication errors, and drug interactions. They should be able to contribute to pharmacovigilance efforts and promote patient safety in pharmacological practice

Professional Skills

- * Students should develop skills in effectively managing medications, including accurate and timely prescription writing, medication order review, dosage calculations, and medication administration techniques. They should demonstrate attention to detail and adhere to safe medication practices
- * Students should demonstrate the ability to work collaboratively with other healthcare professionals, such as physicians, nurses, pharmacists, and allied health professionals, in the management of pharmacotherapy. They should effectively communicate and contribute to interprofessional teams to optimize patient outcomes
- * Students should acquire effective communication skills to provide patient-centered counseling on medication use, including proper administration, potential side effects, drug interactions, and adherence strategies. They should be able to educate patients on the appropriate use and potential risks of medications

Professional Skills	* Students should demonstrate knowledge of medication safety principles, including error prevention, adverse event reporting, and risk management strategies. They should identify and mitigate potential medication-related risks and contribute to promoting patient safety in pharmacological practice * Students should develop skills in accurate and comprehensive documentation of medication-related information, including medication histories, medication reconciliations, adverse drug reactions, and therapeutic monitoring. They should adhere to legal and ethical standards in record-keeping
General Skill	* Students should develop effective oral and written communication skills to convey complex pharmacological concepts to patients, healthcare professionals, and other stakeholders. They should be able to explain drug therapy, provide clear instructions, and document medication-related information accurately * Students should acquire numeracy skills necessary for pharmacological calculations, such as dosage calculations, infusion rates, and pharmacokinetic calculations. They should be able to interpret numerical data and perform calculations accurately * Students should demonstrate attention to detail in pharmacological practice, including accurate medication orders, proper dosage calculations, and diligent review of medication-related information. They should be able to identify and prevent potential medication errors * Students should develop effective time management skills to prioritize tasks, meet deadlines, and efficiently manage medication-related responsibilities. They should be able to balance multiple priorities and optimize workflow in pharmacological practice * Students should develop skills in working collaboratively with colleagues, healthcare professionals, and patients to achieve optimal medication-related outcomes. They should be able to contribute effectively to interprofessional teams and respect diverse perspectives

Course Contents

1	-	Introduction to Pharmacology
2	-	Pharmacokinetics
3	-	Pharmacodynamics
4	-	Pharmacogenetics and Personalized Medicine
5	-	Central Nervous System Pharmacology
6	-	Cardiovascular Pharmacology
7	-	Anti-Infective Pharmacology
8	-	Pharmacology of Inflammation and Immune System
9	-	Endocrine Pharmacology
10	-	Gastrointestinal and Renal Pharmacology
11	-	Chemotherapy and Cancer Pharmacology
12	-	Herbal and Alternative Medicines
13	-	Ethical and Legal Considerations in Pharmacology

Teaching and Learning Methods

- 1 - Lectures
- 2 - Small-Group Discussions
- 3 - Case-Based Learning
- 4 - Problem-Based Learning
- 5 - Laboratory Sessions
- 6 - Computer-Assisted Learning
- 7 - Clinical Rotations and Observations
- 8 - Medication Case Presentations
- 9 - Guest Lectures and Expert Panels
- 10 - Online Resources and E-Learning

Students Assessment

<u>Assessment Method</u>	<u>TIME</u>	<u>MARKS</u>
First exam	6th week	20
attendance	At the end of the course	10
Research	8th week	20
Final exam	At the end of the course	50

Books and References

Essential books	Lippincott Illustrated Reviews: Pharmacology by Richard A. Harvey, Pamela C. Champe, and Bruce D. Fisher
Recommended books	Basic and Clinical Pharmacology by Bertram G. Katzung, Anthony J. Trevor, and Marieke Knudering-Hall Pharmacology: Principles and Practice by Miles Hacker, William S. Messer Jr., and Kenneth A. Bachmann
Other References (Periodical, web sites, etc.)	National Center for Biotechnology Information (NCBI) https://www.ncbi.nlm.nih.gov Clinical Pharmacology and Therapeutics by Gerard A. McKay, Neil R. A. McIntyre, and Peter J. L. McLachlan