The University of Jordan

الجامعة الاردنية

Form: Course Syllabus	Form Number	EXC-01-02-02A
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1.	Course Title	Introduction to Pharmacology
2.	Course Number	0503201
3.	Credit Hours (Theory, Practical)	2 Theory
	Contact Hours (Theory, Practical)	14 weeks, twice per week
4.	Prerequisites/ Corequisites	--
5.	Program Title	Doctor of Medicine
6.	Program Code	05
7.	School/ Center	School of Medicine
8.	Department	Department of Pharmacology
9.	Course Level	Bachelor
10.	Year of Study and Semester (s)	Second year/ first Semester
11.	Program Degree	Bachelor
12.	Other Department(s) Involved in Teaching the Course	-
13.	Learning Language	English
14.	Learning Types	☒Face to face learning ☐Blended ☐Fully online
15.	Online Platforms(s)	☒Moodle ☒Microsoft Teams
16	Issuing Date	20/12/2023
17.	Revision Date	11-5-2025

18. Course Coordinator:

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20. Course Description:

A- Course Description:

The first part of this course explores pharmacodynamics, pharmacokinetics, drug actions and interactions. The second part of the course focuses on the autonomic nervous system and its pharmacology. The third part of the course focuses on fundamental principles in anti-microbial, antiviral and anticancer drugs.

B- Aims:

The aim of this course is to:

1. Explore and understand pharmacodynamics, pharmacokinetics, drug actions and interactions.

2. Understand the importance of patient safety during medication administration.

3. Describe the actual and potential effects of commonly used medications that may be important in rehabilitation

4. Understand the ethical and legal issues related to dentists' roles and responsibilities in medication administration.

21. Program Intended Learning Outcomes: (To be used in designing the matrix linking the intended learning outcomes of the course with the intended learning outcomes of the program)

PLO's	*National Qualifications Framework Descriptors*		
	Competency (C)	Skills (B)	Knowledge (A)
1.	☐	☐	☒
2.	☐	☒	☐
3.	☒	☐	☐
4.	☐	☐	☒
5.	☐	☒	☐
6	☒	☐	☐
7	☐	☐	☒
8	☒	☐	☐

* Choose only one descriptor for each learning outcome of the program, whether knowledge, skill, or competency.

Program Intended Learning Outcomes:

1. **Demonstrate basic knowledge of normal human structure and function at molecular, genetic, cellular, tissue, organ, system and whole-body levels in terms of growth, development, and health maintenance. Analyze the basic molecular and cellular mechanisms involved in the causation and treatment of human disease and their influence on clinical presentation and therapy.**

2. **Collect, interpret, document, and communicate accurately a comprehensive medical history, including the psychological and behavioral factors, and a thorough organ-system-specific physical examination inclusive of the mental status of the patient.**

3. **Integrate and communicate collected clinical information in the construction of appropriate diagnostic and therapeutic management strategies to identify life-threatening conditions ensuring prompt therapy, referral, and consultation with relevant disciplines and skillfully perform basic medical procedures for general practice on patients with common illness, acute and chronic, taking into account environmental, social, cultural and psychological factors.**

4. **Demonstrate in-depth knowledge of the epidemiology and biostatistics of common diseases, and analyze the impact of ethnicity, culture, socioeconomic factors and other social factors on health, disease and individual patient's health care.**

5. **Communicate effectively and professionally, both orally and in writing, with patients, their families, and with other healthcare providers utilizing information technology resources in his/her scholarly activities and professional development with the ability to teach others, and to understand and respect other healthcare professionals 'roles, and apply the principles of multidisciplinary teamwork dynamics and collaboration.**

6. **Apply scientific methods including evidence –based approach to the medical practice including problem identification, data collection, hypothesis formulation, etc., and apply inductive reasoning to problem solving and ensure that clinical reasoning and decision making are guided by sound ethical principles.**

7. **Demonstrate knowledge of scientific research methods and ethical principles of clinical research and be able to write research proposals or research papers.**

   Demonstrate professionally the skills needed for Quality improvement, lifelong learning, and continuous medical education including the ability to identify and address personal strength and weakness, self-assess knowledge and performance, and develop a self-improvement plan

22. Course Intended Learning Outcomes: (Upon completion of the course, the student will be able to achieve the following intended learning outcomes)

Course ILOs #	The learning levels to be achieved						Competencies
	Remember	Understand	Apply	Analyse	Evaluate	Create	
1.	✓	✓					Describe and explain the fundamental concepts of pharmacotherapeutics, pharmacokinetics, pharmacodynamics, and pharmacogenetics/genomics.
2.		✓	✓	✓	✓	✓	Describe principles of safe administration of medications.
3.		✓	✓	✓	✓	✓	Recognize the basics for proper choice of drug/s in proper dose in relation to age, sex,

							genetic variation and concomitant disorders.
4.		✓	✓	✓	✓	✓	Describe the pharmacological actions and uses of drugs acting on the autonomic nervous system.
5.		✓	✓	✓	✓	✓	Explain the mechanisms of action and side effects of the autonomic nervous system.
6		✓	✓	✓	✓	✓	Explain the principles of antimicrobial and antiviral drugs and antiviral drugs, selective toxicity and clinical application.
7		✓	✓	✓	✓	✓	Demonstrate knowledge and understanding of the mechanisms of drug action and drug resistance for both antimicrobial and antiviral drugs and antiviral drugs
8		✓	✓	✓	✓	✓	Describe and explain major methods used in the treatment of cancer.
9		✓	✓	✓	✓	✓	Appraise the range of chemotherapeutic agents and have an understanding of their modes of action

23. The matrix linking the intended learning outcomes of the course -CLO's with the intended learning outcomes of the program -PLOs:

PLO's * / CLO's	1	2	3	4	5	6	7	8	9	Descriptors**		
										A	B	C
1	✓	✓	✓	✓			✓	✓		✓		
2											✓	
3					✓	✓			✓			✓
4										✓		
5											✓	
6												✓
7										✓		
8												✓

***Linking each course learning outcome (CLO) to only one program outcome (PLO) as specified in the course matrix.**

****Descriptors are determined according to the program learning outcome (PLO) that was chosen and according to what was specified in the program learning outcomes matrix in clause (21).**

24. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome (SLO)	Descriptors **	Learning Types (Face to Face/Blended/ Fully Online)	Platform Used	Synchronous / Asynchronous Lecturing	Evaluation Methods	Learning Resources
1	1.1	**Definitions& General principles**	State the different types of drug formulations, their advantages and disadvantages, and their routes of administration. Understand that the beneficial clinical effects of drugs may also lead to adverse side effects	K	Face to face		Synchronous Lecturing	Written exam	A
	1.2	**Pharmacokinetics 1**	Define pharmacokinetics according to the acronym ADME and describe the mechanism of drug absorption	K	Face to face		Synchronous Lecturing	Written exam	A

2	2.1	**Pharmacokinetics 2**	Explain the concepts of drug distribution and elimination Understand the concept of volume of distribution, plasma protein binding, steady state plasma drug concentrations Differentiate between first-order and zero-order kinetics of drug elimination	K	Face to face		Synchronous Lecturing	Written exam	A
	2.2	**Pharmacokinetics 3**			Face to face		Synchronous Lecturing	Written exam	A
3	3.1	**Pharmacodynamics 1**	Describe the role of receptors as targets for drug action, the difference between an agonist and antagonist.	K	Face to face		Synchronous Lecturing	Written exam	A
	3.2	**Pharmacodynamics 2**	Define the concepts of drug selectivity, potency, efficacy, full and partial agonism and antagonism	K	Face to face		Synchronous Lecturing	Written exam	B
4	4.1	**Pharmacodynamics 3**	Explain the relationship between drug dose (or concentration), receptor occupation and biologic response	K	Face to face		Synchronous Lecturing	Written exam	A
	4.2	**Pharmacodynamics 4**	Differentiate between the major types of receptor signaling mechanisms and their signal transduction pathways.	K	Face to face		Synchronous Lecturing	Written exam	B

5	5.1	**Drug Interactions and Adverse Drug Effects**	Combine their pharmacokinetic and pharmacodynamics knowledge to grasp the dose- effect relationship between a beneficial or toxic effect of a drug and the concentration of the drug Understand the mechanisms of drug-drug interactions and provide examples Acknowledge the role of genetics in the variations in drug metabolism and drug response in a population	K,S	Face to face		Synchronous Lecturing	Written exam	A
	5.2	**Autonomic Nervous System (ANS) Pharmacology**	Explain the structure and function of the autonomic nervous system in terms of drug actions Identify the visceral organs that are innervated by the sympathetic and parasympathetic systems and the functional responses of the organs to activation of either system.	K,S	Face to face		Synchronous Lecturing	Written exam	A
6	6.1	**ANS Pharmacology**	List the classifications and actions of autonomic nervous system drugs	K,S	Face to face		Synchronous Lecturing	Written exam	B
	6.2	**ANS Pharmacology**	Describe the most important therapeutic uses for the endogenous and synthetic adrenergic agonists List the most important toxic side effects and therapeutic uses of adrenergic agonists.	K,S	Face to face		Synchronous Lecturing	Written exam	A, B

7	7.1	**ANS Pharmacology**	Describe the major α-adrenergic receptor antagonists currently used in clinical practice and their principal indications Understand the differences between the different α-adrenergic receptor antagonists with regard to their selectivity List the most serious side effects caused by α-adrenergic receptor antagonists	K,S	Face to face		Synchronous Lecturing	Written exam	A
	7.2	**ANS Pharmacology**	Describe the major β-adrenergic receptor antagonists that are most commonly used in clinical practice and their principal indications Understand the differences between the different β-adrenergic receptor antagonists with regard to their selectivity and duration of action. List the most serious side effects caused by β-adrenergic receptor antagonists	K,S	Face to face		Synchronous Lecturing	Written exam	B
8	**Midterm exam**								
9	9.1	**ANS Pharmacology**	Describe the main structural and functional differences between nicotinic and muscarinic receptors, their mechanisms of action, and their location in the body. Identify the differences between parasympathetic and nicotinic effects on the body.	K,S	Face to face		Synchronous Lecturing	Written exam	A

	9.2	**ANS Pharmacology**	Describe the mechanisms of action of directly and indirectly acting cholinergic agonists, and their therapeutic effects	K,S	Face to face		Synchronous Lecturing	Written exam	A
10	10.1	**ANS Pharmacology**	Describe the mechanism of action of reversible and irreversible cholinesterase inhibitors, and their therapeutic effects List antidotes to counteract their effetcs	K,S	Face to face		Synchronous Lecturing	Written exam	A
	10.2	**ANS Pharmacology**	Identify the difference in the mechanism of action between depolarizing and non-depolarizing neuromuscular blockers List the prominent side effects of each class of skeletal muscle relaxant and the antidote for either class of neuromuscular blockers.	K,	Face to face		Synchronous Lecturing	Written exam	B

11	11.1	**Chemotherapeutics Drugs**	Define the terms MIC, MBC, and MIC susceptibility breakpoints and the differences between the antimicrobial susceptibility testing methods. Define the common pharmacodynamic terminology used to describe the effects of antimicrobial therapy such as bacteriostatic, bactericidal, concentration-dependent, and time-dependent bactericidal activity. Know examples of antibiotics that display each of these properties. Understand the factors that should be considered in the antibiotic selection process for each patient in the treatment of infection.	K,S	Face to face		Synchronous Lecturing	Written exam	A
	11.2	**Chemotherapeutics Drugs**	Describe the general characteristics of cell wall inhibitors including the β-lactam antibiotics Understand the indications, mechanism of action, adverse effects and contraindications of cell wall inhibitors along with the mechanisms by which bacteria develop resistance to the them	K,S	Face to face		Synchronous Lecturing	Written exam	B
12	12.1	Chemotherapeutics Drugs	Describe the general characteristics of protein synthesis inhibitors Understand the indications, mechanism of action, adverse effects and contraindications of protein synthesis inhibitors along with the mechanisms by which bacteria develop resistance to the them	K,S	Face to face		Synchronous Lecturing	Written exam	A

	12.2	Chemotherapeutics Drugs	Describe the general characteristics of fluoroquinolones, sulfonamides, metronidazole, and other antibiotic therapy Understand their indications, mechanism of action, adverse effects and contraindications	K,S	Face to face		Synchronous Lecturing	Written exam	A
13	13.1	Chemotherapeutics Drugs	Understand the mechanism of action of the major nucleoside and non-nucleoside analogs List viruses targeted by each group and the mechanisms leading to the development of antiviral resistance	K,S	Face to face		Synchronous Lecturing	Written exam	A
	13.2	Chemotherapeutics Drugs	Understand the principles of chemotherapy, patient management, toxicity of cancer chemotherapy and the rationale for the administration of adjuvant chemotherapy Describe the characteristic indications for the alkylating agents and plant alkaloids commonly used in chemotherapy, their mechanism of action and mechanisms of resistance, and their principle adverse effects	K,S	Face to face		Synchronous Lecturing	Written exam	B

14	14.1	Chemotherapeutics Drugs	Describe the characteristic indications, mechanism of action, mechanism of resistance and adverse effects of doxorubicin and other commonly used antibiotic and anti-tumor agents. Understand the characteristic indications for the use of antimetabolites commonly used in the treatment of cancer, their mechanism of action, mechanism of resistance and the major adverse effects associated with their use.	K,S	Face to face		Synchronous Lecturing	Written exam	A
	14.2	Chemotherapeutics Drugs	Describe the concept of "targeted cancer therapy" and the role of tyrosine kinases as targets for cancer therapy	K	Face to face		Synchronous Lecturing	Written exam	B
** K: Knowledge, S: Skills, C: Competency									

25. Evaluation Methods:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

Evaluation Activity	Mark	Topic(s)	CLOs	Descriptors**	Period (Week)	Platform
Midterm exam	40	All blended topics	1,2,3,4,5,6,7,8,9	K S	8th week	Paper-based exam
Evaluation	10	All blended topics	1,2,3,4,5,6,7,8,9	K S	1st-14th week	
Final exam	50	All blended topics	1,2,3,4,5,6,7,8,9	K S	15th -16th week	Paper-based exam
** K: Knowledge, S: Skills, C: Competency						

*** According to the instructions for granting a Bachelor's degree.**

****According to the principles of organizing semester work, tests, examinations, and grades for the bachelor's degree.**

Mid-term exam specifications table*

(Tables below are completed on separate forms by course coordinators prior to conduction of each exam according to Accreditation and Quality Assurance Centre procedures and forms)

No. of questions/ cognitive level						No. of questions per CLO	Total exam mark	Total no. of questions	CLO/ Weight	CLO no.
Create %10	Evaluate %10	analyse %10	Apply %20	Understand %20	Remember %30					
1	1	1	4	2	1	10	100	100	10%	1

Final exam specifications table

No. of questions/ cognitive level				CLO	

Create %10	Evaluate %10	analyse %10	Apply %20	Understand %20	Remember %30	No. of questions per CLO	Total exam mark	Total no. of questions	Weight	CLO no.
										1
										2
										3
										4
										5

26. Course Requirements:

- ✓ **Class room Lectures**
- ✓ **Internet connection**

Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- ✓ **Classroom Lectures**
- ✓ **PowerPoint presentations**
- ✓ **Discussion sessions and forums**

27. Course Policies:

A- Attendance policies:

Attendance will be monitored by the course coordinator. Attendance policies will be announced at the beginning of the course.

B- Absences from exams and handing in assignments on time:

Will be managed according to the University of Jordan regulations. Refer to http://registration.ju.edu.jo/Documents/daleel.pdf

C- Health and safety procedures:

Faculty Members and students must at all times, conform to Health and Safety rules and procedures.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

As a student in this course (and at this university) you are expected to maintain high degrees of professionalism, commitment to active learning and participation in this course and also integrity in your behavior in and out of the

classroom. Students violate this policy would be subjected to disciplinary action according to University of Jordan disciplinary policies

E- Grading policy:

Grade-point average, Rules are preset by the Faculty and Department Councils

F- **Available university services that support achievement in the course:**

Availability of comfortable lecture halls, data show, internet service and E learning website https://elearning.ju.edu.jo/ .

28. References:

A. Required book (s), assigned reading and audio-visuals:
   - **Basic and Clinical Pharmacology; B. G Katzung; 14th Edition 2007**

B. Recommended books, materials, and media:
   - **Pharmacology, Lippincott's Illustrated Reviews; Howland RD and Mycek MJ; 3rd edition 2006; Lippincott Williams and Wilkins**
   - **Modern Pharmacology with Clinical Applications; Craig & Stitzel; 6th Edition 2004 (or a newer edition)**
   - **Goodman and Gilman's; The Pharmacological Basis of Therapeutics; Brunton, Lazo, Parker**

Name of the Instructor or the Course Coordinator: Professor Malik Zihlif	Signature:	Date: 9-7-2025
Name of the Head of Department Professor Malik Zihlif	Signature:	Date: 9-7-2025
Name of the Head of Quality Assurance Committee/ Department D.r Enas Al-Zayadneh	Signature:	Date: 11/5/2025
Name of the Head of Quality Assurance Committee/ School or Center Professor 'Ayman Wahbeh	Signature:	Date: .....
Name of the Dean or the Director Professor Ayman Wahbeh	Signature:	Date: 10/7/2025

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