



Institute of Dentistry,
CMH Lahore Medical College

Study Guide

Department of Pharmacology
2nd Year BDS 2023

MISSION STATEMENT NUMS

The University will endeavor to improve existing knowledge, and practices in the fields of medical and allied life sciences; both pure and applied, including fields of biomedical engineering and technologies, veterinary, biogenetic, social and behavioral sciences through innovative and creative approaches in order to offer best possible services to the society and humanity at large.

VISION STATEMENT NUMS

The vision of National University of Medical Sciences is to improve the quality of life through education, research, innovation, and healthcare, thereby, contributing to endeavors to make Pakistan and this world better place to live in.

CMH LMC & IOD Vision statement :

The CMH Lahore Medical College and Institute of Dentistry aims to provide a highly conducive environment to train a new generation of technology savvy and socially responsible healthcare providers who are well-versed with their role within a healthcare team and while serving the community, demonstrate abilities to practice requisite communication skills, empathy, lifelong learning, critical thinking and decision making at a national or an international facility.

CMH LMC & IOD Mission Statement:

The mission of CMH Lahore Medical College and Institute of Dentistry is to undertake following steps to materialize their vision:

1. Ensure provision of a conducive educational environment where students feel well-supported through implementation of learner-centered teaching approaches, inbuilt strong feedback loops and physically comfortable learning environment.
2. Sensitization of students about their role in the society as socially responsible professionals through participation in extracurricular activities like community-based programs, patient welfare societies, blood donors' society, and productive contribution to combat local and national calamities.
3. Students' exposure to the healthcare community, where sympathy and empathy are the cornerstones of our practice. Students commit to understanding their patients not only through their medical conditions but also through their emotions, fears, and unique life experiences by

fostering a culture of compassion, students aim to provide not just medical care but genuine understanding and support to enhance the well-being of those we serve.

4. Students' exposure to cutting-edge technology through campus learning management system and development of their e-portfolios.
5. Leadership and Smart Learning Strategies through implementation of inter-professional curriculum for undergraduate health professions' education students enrolled in medical, dental, allied health sciences, and nursing programs.
6. Provision of opportunities to undergraduate and post-graduate students to have practical experience of leading, working as a team member, critical thinking, problem solving, and decision making.
7. Formal teaching and training of professionalism for students to develop their full potential including communication, and lifelong learning skills through portfolio development among undergraduate and postgraduate students.
8. Implementation of a task-based and outcome oriented longitudinal module on 'Research' for undergraduate students, leading to publication of research article/s and for cultivation of evidence-based practices.

Introduction to Pharmacology Department

The department is headed by Dr. Waqar Ahmed Siddiqui for Institute of Dentistry. The team of qualified and experienced faculty members is dedicated to provide excellent learning experience for undergraduate students. Members of the department have a number of national and international research publications. This course will provide students with an understanding of the scientific foundations of the study of pharmacology. This includes the basic principles of drug action and a deeper insight of autonomic nervous system, special Pharmacology comprising of drugs therapy of diseases of cardiovascular system, nervous system, gastrointestinal system, respiratory systems, chemotherapy, endocrinology, anesthetics and analgesics. There is a fully functional and state of the art laboratory to enhance skills of undergraduates in subject of Pharmacology.

This course will comprise three core teaching blocks and a self-directed learning block involving independent and group work.

Aims:

- To expedite the academic growth and development of the undergraduate students.
- To enhance the culture of research in both under and post graduate students.
- Development of trained medical faculty in basic sciences

Curricular map of Pharmacology

By the end of 2nd year, BDS students should be able to co-relate basic concepts of Pharmacology with practical work/clinical skill

Institute of Dentistry &
CMH Lahore Medical
College

Learning
location

Learning
outcomes

Student
assessment

- Cognition: MCQs, SEQs, SAQs, VIVA
- Psychomotor: Practical
- Affective: Direct observation

- Lecture halls
- Discussion Rooms
- Library
- E-books

Resources

Pharmacology

Content

NUMS/PMC guidelines for
Pharmacology

Educational
strategies

Staff

Time table

- Lectures
- Practicals
- Small group discussions
- Self-study
- Assignments

- Faculty: Professor, Demonstrators
- Supporting staff: Lab assistant, lecture hall attendant, computer operator

- Course duration: 38 weeks
- Lectures: 4 per week
- Practical: 1 per week

Resources:

- A. Teaching resources
- B. Supporting staff
- C. Infrastructure resources

A. Teaching Resources

(Faculty members designated for BDS)

Sr.No	Name	Designation	Qualification	PMDC Reg No	Teaching Experience	Status P/V/C
BDS Faculty						
1	Dr. Waqr Ahmed Siddiqui	HoD (IOD)	MBBS,M.Phil, Ph.D Scholar	55291-P	9 yrs 7 months	C
2	Dr.Ayesha Aijaz	Demonstrator	BDS, RDS	22101-D	10 months	C
3	Dr. Abdul Mateen	Demonstrator	BDS, RDS, C. ESST & REST. Dent	718030-01-D	10 months	C
4	Dr. Ammar Khalid	Demonstrator	MBBS	747273-01-M	2 months	C

Supporting staff

STATEMENT SHOWING THE QUALIFICATION AND EXPERIENCE OF SUPPORT STAFF

BDS support staff

Sr.No	Name	Designation	Qualification	Experience	Status P /C
1	Muhammad Adnan	Lab Attendant	Matric	4 yrs 2 months	C
2	Mudassar Ali	Computer Operator	B.com	7 yrs	C

Shared support staff with MBBS

Sr.No	Name	Designation	Qualification	Experience	Status P /C
1	Bilal Ashraf	Lab Technician	B.A, B.Ed	10 yrs 5 months	C
2	Muhammad Akbar	Store Keeper	Fsc	10 yrs 6 months	C
3	Jahangir Masih	Office Orderly	Matric	17 yrs 2 months	C

B. Supporting staff Requirements:

Sr. No	Designation	Requirement	Available/Actual	Deficiency
1	HLA/Lab technician	02	01	01
2	Stenographer/computer Operator	01	01	None
3	Lecture hall attendant	01	01	None
4	Store keeper	01	01	None

C. Infrastructure resources

Sr. #	Infrastructure resources	Quantity
1.	Lecture Hall	1
	Seating	80
	Mutimedia	1
	Microphone	1
	Computer system	1
	White board	1
2.	Laboratory	1
	Seating	80
	Multimedia	1
	White board	1
3.	Store	1
4.	Departmental Library	1

Teaching and Learning Strategies:

Multiple educational methods will be used comprising of self-study, interactive lectures, group discussions and practicals.

(i) **Methods for achieving cognitive objectives**

- Interactive lectures using audio visual aids on power point presentation
- Group discussions in form of large group and small group
- Collaborative learning
- Self-study and reading from learning resources

(ii) **Methods for achieving psychomotor objectives**

- Performing practicals of Pharmacy and small projects/assignments

(iii) **Methods for achieving affective objectives**

- Interaction with peers, group members, teachers, support staff etc.
- Group discussions (small and large)
- Oral presentations by student

LEARNING METHODOLOGIES :

The following teaching / learning methods are used to promote better understanding:

- Interactive Lectures/Online Zoom Lectures
- Small Group Discussion (WhatsApp & In-person)
- Tutorials/Case- Based Learning
- Practicals covering skills
- E- Learning
- Self- Directed Study

INTERACTIVE LECTURES

In large group, the lecturer introduces a topic or common clinical conditions and explains the underlying phenomena through Clinical scenarios, MCQs, short questions, pictures, videos of patients, interviews etc. students are actively involved in the learning process.

SMALL GROUP DISCUSSION (SGD)

This format helps students to clarify concepts acquire skills or attitudes. Sessions are structured with the help of specific exercise such as patient case, interviews or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

TUTORIALS/CASE- BASED LEARNING

A small group discussion format where learning is focused around a series of questions based on a clinical scenario. Students' discuss and answer the questions applying relevant knowledge gained in clinical and basic health sciences during the module.

PRACTICAL

Pharmacology practicals are scheduled for student learning & polishing skills.

SELF DIRECTED STUDY

Students' assume responsibilities of their own learning through individual study, sharing and discussing with peer, seeking information from Learning Resource center, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self- study.

E- LEARNING

E-Learning is a strategy by which learning occurs through the utilization of electronic media, typically the Internet. Campus Management System (CMS) is accessible to all students and faculty for E-learning. Assignments, Discussions & Quizzes are assigned to enhance students learning.

Curriculum Implementation:

Curriculum implementation refers to putting into practice the official document including course content, objectives, learning and teaching strategies. Implementation process helps the learner to achieve knowledge, skills and attitudes required of the learning tasks. Learners are a pertinent component of the implementation process. Implementation occurs when the learner achieves the intended learning experiences, knowledge, ideas, skills and attitudes which are aimed to make the learner an effective part of the society. Curriculum implementation also refers to the stage at which curriculum is put into effect. There has to be an implementing agent as well. Teacher is an important part of this process and implementation of the curriculum is the way the teacher selects and utilizes various components of the curriculum. Implementation occurs when the teacher's formulated course content, teacher's personality and teaching and learning environment interact with the learners. Therefore, curriculum implementation is how the officially planned course of study is translated and reflected by the teacher into schemes of work, lesson plans, syllabus and resources are effectively transferred to the learners. Curriculum implementation can be affected by certain factors such as teachers, learners, learning environment, resource materials and facilities, culture and ideology, instructional supervision and assessments.

Personnel involved in teaching and facilitation:

Lectures & tutorials conducted by:

Dr. Waqar Ahmed Siddiqui (Associate Professor of Pharmacology-IOD), Dr. Ssehrish Zaffar (Associate Professor of Pharmacology), Dr. Ayela Eman zia (Assistant Professor of Pharmacology), Dr. Usman Aslam (Assistant Professor of Pharmacology-IOD).

Practical demonstrators & tutorials conducted by:

Dr. Ayesha Aijaz, Dr. Abdul Mateen, Dr. Ammar Khalid, Dr. Sidra Ikram, Dr. Sidra Zahid, Dr. Abeerah Idrees, Dr. Maham Dilshad, Dr. Minahil Abid, Dr. Ayera Pervaiz, Dr. Zoya Seher, Dr. Saif-ul-Rehman, Dr. Minahil Mukhtar

Support staff:

Personal assistant, Lab assistant, Store keeper, Lecture hall Attendant, Computer operator.

Time Frame:

Course duration: 38 weeks

Lectures: Monday (08:50 to 09:40am), Tuesday (09:40 to 10:30am), Wednesday (11:50 to 12:40pm), Friday (09:40 to 10:30am & 1:20 to 2:10pm)

Practicals/Tutorials: Tuesday (11:45am to 02:00pm), Wednesday (12:40 to 03:00pm)

Learning Outcomes of Pharmacology for 2nd Year BDS Students:

Demonstrate understanding of brief history of pharmacology, principles of pharmacokinetics, bio-transformation of drugs and its clinical significance, identify synthesis, release and transport of adrenergic and cholinergic neurotransmitters, the basic & clinical pharmacology of catecholamines, non-catecholamines, sympatholytics, cholinergic drugs, cholinesterase inhibitors, organophosphates & oximes, cholinergic blockers, skeletal muscle relaxants, drugs acting on CNS, inflammation & gout, in CVS, diuretics, chemotherapeutics, on endocrine system, for treatment of anemia & coagulation disorders & of gastrointestinal & respiratory disorders.

Curriculum Document BDS 2nd Year
Pharmacology & Therapeutics
Block I 13 weeks, Block II 17 weeks, Block III 15 weeks.
Total =45 weeks
Spring+Summer+Prep leaves=6 weeks

Pharmacology Block I (Duration 13 weeks) spring vacations= 1 week

Sr. no.	Theme	Contents	Learning objectives	Learning outcomes	Domain of Learning	Learning resource	Mode of Information Transfer
1.	General Pharmacology	Pharmacology: Introduction, Historical overview Branches/division of Pharmacology, Sources & active principles of drugs Routes of administration of drugs Pharmacokinetics: Absorption of drugs: processes Factors modifying drug absorption Distribution & plasma protein binding of drugs Metabolism of drugs Factors modifying drug transformation	-To review the pharmacodynamic and pharmacokinetic concepts of drug action. It will examine and interpret modern strategies of drug discovery in the	Interpret the different pharmacokinetic patterns, their clinical significance and factors affecting these parameters. Correlate the concept of molecular mechanistic to the therapeutics. Identify the	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals

		availability: clinical significance & factors affecting half-life of drugs: factors affecting & clinical significance excretion of drugs: Drug clearance Pharmacodynamics: mechanism of drug action factors modifying actions & uses of drugs	pharmaceutic al industry and molecular mechanisms of drug	genetic principles in drug disposition			
2.	Drugs acting on ANS	A N S: Introduction Parasympathomimetics or cholinergic Drugs Anti Cholinesterases, Myasthenia gravis Organophosphate poisoning & Oximes Cholinergic blockers: Natural alkaloids, Comparison between Hyoscine & Atropine Catecholamines: Adrenaline., Nor adrenaline, Dopamine & Dobutamine Non Catecholamines: Ephedrine, Amphetamines α/β 2 receptor agonists etc Adrenergic Blockers: Alpha- receptor Blockers, Beta receptor Blockers Central	-Integrative study of drugs, their mechanism of action, and their side effects after having understanding of drugs acting on autonomic nervous system.	Correlate the physiology of autonomic receptors with the therapeutic application	C1, C2, C3	Multimedia, Textbooks, Library, Recommend ed websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)

		Sympathoplegics Skeletal Muscle Relaxants Drug treatment of glaucoma					
3.	Central Nervous System	Central Neurotransmission Gen Anesthetics Local Anesthetics (LA) Aliphatic Alcohols Sedatives/Anxiolytics & Hypnotics Anti-epilepsy drugs treatment of Migraine Non-Narcotic Analgesics Opioids Drug Dependence Anti- depressant	Clinical Practice Oriented discussion of Neuro-pharmacology .	Correlate the Differentiate between different pharmacological agents (LA, GA, opioids) used in the pain management correlating it to the underlying pathophysiology of the disease Interpret the effects of anti-epileptic drugs in relation to neuro-excitatory illnesses Strategize the management of migraine in accordance with the underlying disease			

				<p>mechanism Correlate the effects of substances of abuse (alcohol, opioids, heroin) on body to its plan for aversion therapy Critique on the pharmacological effects of sedative /hypnotics and Anti-depressants</p>			
<p>Pharmacology & Therapeutics Block II 17 weeks, Summer vacations=4 week</p>							
<p>Pharmacology Block II (Duration 17 weeks)- Summer vacations 4 weeks</p>							
4.	Chemothe rapy-I	<p>Introduction & General Principles of Chemotherapy Mechanism of Resistance Penicillins Cephalosporin Sulfonamides Macrolides Tetracyclines Chloramphenicol Aminoglycosides Quinolones 50 11 Anti-</p>	<p>Integrative study of drugs, their mechanism of action, and their side effects in the treatment of major</p>	<p>Justify the treatment modalities for various microbes (bacteria, viruses) according to mode of action,</p>	C1, C2, C3	<p>Multimedia, Textbooks, Library, Recommended websites</p>	<p>Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)</p>

		tuberculosis drugs Misc Drugs: Clindamycin, Fusidic acids, vancomycin, Nitrofurantoin, Linezolid	diseases and pathologies of infectious diseases & chemotherapy .	resistance patterns and regional current practices Illustrate the principles of cancer chemotherapy in relation to its current therapeutic modalities			
5.	Chemothe rapy-II	Anti fungal drugs Anti viral drugs Anti Malarial Anti Amoebics		Justify the treatment modalities for various microbes according to mode of action, resistance patterns and regional current practices-II	C1, C2, C3	Multimedia, Textbooks, Library, Recommend ed websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)
6.	Drugs acting on CVS	Revisiting physiology of CVS Cardiotonic drugs: Management of cardiotoxicity of cardiac glycosides Antihypertensive drugs Drug Treatment of	This unit aims to extend student's knowledge and understanding	Relate the pathophysiology of heart and vessels to its treatment modalities	C1, C2, C3	Multimedia, Textbooks, Library, Recommend ed websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription

		IHD Anti arrhythmic drugs	of cardiovascular pharmacology Particular emphasis will be placed upon personalising treatments for patients with heart disease.				Writing)
7.	Endocrinology	Antidiabetic drugs Thyroid/Anti-thyroid drugs Adrenal Hormones Sex Hormones: Estrogens & Progestins, Anabolic steroids Drug used in treatment of Infertility Hormonal contraceptives Oxytocic drugs & Uterine Relaxants Drug treatment of osteoporosis		Correlate the pathophysiological basis of pituitary, thyroid and adrenal hormones with their therapeutics. Correlate types of diabetes mellitus to their different treatment modalities Justify the clinical use of	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)

				sex hormones in relation to reproductive physiology Correlate the patho-physiological basis of osteoporosis to its pharmacological management.			
Pharmacology Block III (Duration 15 weeks)- Prep leaves 1 week							
8.	NSAIDs and Opioids	Non Narcotic Analgesics a. Non-steroidal Anti-inflammatory drugs (NSAIDs) b. Drugs used in gout. c. DMARDs Opioid drugs	Clinical Practice Oriented discussion of Neuro-pharmacology.	Correlate the Differentiate between different pharmacological agents opioids, NSAIDs used in the pain management correlating it to the underlying pathophysiology of the disease	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)
9.	Drugs acting on GIT	Anti emetics Antidiarrhoeals Purgatives/laxatives Drugs used in Peptic Ulcer	Integrative study of drugs, their	Develop and illustrate the management	C1, C2, C3	Multimedia, Textbooks, Library,	Lectures, Tutorials, Small Group

			mechanism of action, and their side effects in the treatment of major diseases and pathologies of Gastrointestinal system	plan of common disorders of gastrointestinal tract (peptic ulcer, vomiting, constipation, gastropathies, diarrhea).		Recommended websites	Discussions, Practicals (Prescription Writing)
10.	Drugs acting on blood	Haematinics Anticoagulants Thrombolytic Anti-platelets Anti-Hyperlipidemics				Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)
11.	Respiratory System	Expectorants & Antitussives Drugs used in Bronchial Asthma Antihistamines (H1 antagonists) Prostaglandins	Integrative study of drugs, their mechanism of action, and their side effects in the treatment of major diseases and pathologies of the	Develop and justify the management plan of obstructive pulmonary disorders (Asthma, COPD).	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)

			respiratory system				
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LIST OF PRACTICALS 2ND YEAR BDS PHARMACOLOGY

1. PHARMACY (COMMON DRUGS PREPARATIONS):-

- Lotion KMnO₄
- Emulsion castor oil
- Liniment turpentine oil
- Ointment sulphur
- Solutions KMnO₄ + 5 % dextrose in normal saline
- Powder APC (aspirin, paracetamol, caffeine) and ORS
- Mixture carminative mixture/NaHCO₃ mixture
- Suspension bismuth chalk suspension

2. MEASUREMENT SYSTEM:-

- a. Definitions + conversions
 - Metric system
 - Imperial system
- b. Identification of apparatus

- Balance, mortars, glass measures, paper folder, pill tile, spatula

3. PRESCRIPTION WRITING/PARTS OF PRESCRIPTION/INTERPRETATION OF GIVEN PRESCRIPTION FROM FOLLOWING TOPICS:-

- Tuberculosis, bacillary dysentery, amoebic dysentery, ascariasis, tapeworm infection, ac.streptococcal infection, pharyngitis, iron deficiency anemia, malaria, cerebral malaria, typhoid fever, bronchial asthma, migraine, scabies, ccf, hypertension, watery diarrhea, allergic rhinitis

4. DEFINITIONS RELATED TO FOLLOWING TOPICS INCLUDED BUT CALCULATIOS ARE NOT INCLUDED:-

- Types of solutions, Stock solution, Percentage & Molar solutions

5. ROUTES OF ADMINISTRATION: Local anesthetics, Opioids/NSAIDs, Adrenaline

DEPARTMENTAL LIBRARY & Websites

Subject:	Reference	Text books
Pharmacology	KATZUNG & TREVORS basic and clinical pharmacology	Pharmacology by Dale
“	Goodman and Gilman’s (The Pharmacology basics of Therapeutics)	Current Medical diagnosis and treatment
“	Desk reference of clinical pharmacology	Essential of medical Pharmacology by Tripathy
“	Basic and clinical Pharmacology, 15 th edition	Disease of liver and biliary treat
“	-	Clinical gynaecology, endocrinology and infertility
“	-	British National formulary 2018
“	-	An Atlas of pediatric dermatology
“	-	Oxford Handbook of Clinical Medicine
“	-	Pharma cards
“	-	Bertram G.Katzung pharmacology review
“	-	K.D Tripathi pharmacology
“	-	Lippincott’s illustrated review pharmacology
“	-	MCQ practice on pharmacology
“	-	Smart study series pharmacology
“	-	Kumar and Clark clinical medicine volume I

“	-	Kumar and clark clinical medicine Volume II
“	-	Oxford handbook of clinical medicine
“	-	Prep. Manual for undergraduates
“	-	Netter’s illustrated pharmacology
“	-	Pharmaguide
“	-	Essentials of medical pharmacology
“	-	Rapid review of pharmacology(K.D Tripathy)
“	-	Brody’s human pharmacology
“	-	Physiology
“	-	Pharmacology and therapeutics
“	-	Classification and doses
“	-	Kaplan notes of pharmacology
“	-	Pharmacology secrets
“	-	Brody’s Human Pharmacology
“	Website: https://www.pharmacology2000.com/	
“	https://alison.com/courses/pharmacology	
	https://www.classcentral.com/institution/moodle	

Other Learning Resources

Online Zoom Lectures: Students login at stipulated lecture time on zoom and power point presentations with interspersed MCQs related to the topic taught are asked to get feedback of learning.

WhatsApp & Zoom: Online Small Group Discussions (10 students in each group) with videos related to the topics are shown for better understanding.

LMS Quiz, Discussions & assignments: For formative assessments of students
Feedback from students on google forms for online teaching & assessments.

Hands-on activities: Students will be involved in practical session and hands-on activities to enhance learning.

Labs: Utilize the lab to perform Pharmacy practicals, weights and measures and dose calculations.

Videos: Videos of Pharmacy practicals and drugs mechanism of action to clear the concepts of the students shown during interactive lecture sessions.

Computer lab/CDs/DVDs/Internet resources: To increase the knowledge, students should utilize the available internet resources and CDs/DVDs in main IT lab/personal laptops.

Self-study: Self-study is incorporated to help the student in managing individual tasks/assignments. Student will search for information through available resources

TECHNICAL EQUIPMENT PHARMACOLOGY DEPARTMENT

Sr.No	Nomenclature
1.	Blood Pressure apparatus
2.	Stethoscope
3.	Electronic balance
4.	Power lab
5.	Torch
6.	Balance
7.	Weight box
8.	Spatulas
9.	Ointment box
10.	Scissor 6"
11.	Scissor 8"
12.	Funnel

13.	Beaker 250 ml
14.	Graduated cylinders
15.	Graduated cylinders 10 ml
16.	Bottle white 8 oz
17.	Bottle brown
18.	Surgical instrument trolley
19.	Reservoir bottle 2.5 L
20.	Reservoir bottle 5 L
21.	Test tube rack
22.	Forceps
23.	Scissors
24.	Probe
25.	Stop watch
26.	Sphygmomanometers
27.	Iron stands with clamp
28.	Weight box
29.	Thermometer
30.	Beakers 50 ml
31.	Beaker 1000 ml

32.	Graduated cylinder 1000 ml
33.	Volumetric flask
34.	Conical flask with jet
35.	Analytic balance
36.	Kymograph
37.	Organ bath
38.	Oxygen gas regulator
39.	Animal boards
40.	Dissection trays
41.	Glass canola
42.	Reagent bottle 100 ml
43.	Reagent bottle 250 ml
44.	Reagent bottles 1000 ml
45.	Bottles 2 oz
46.	Bottles 8 oz
47.	Artery forceps
48.	Digital balance
49.	Beaker 1000 ml
50.	Pipettes 1 ml

51.	Pipettes 2 ml
52.	Pipettes 10 ml
53.	Plastic cane
54.	Petri dishes
55.	Tissue bath
56.	Knife
57.	Pestle mortar
58.	T. Joint
59.	Oxygen tube catcher
60.	Tyrode tube catcher
61.	Distillation plant
62.	Paper folder
63.	Pinch cork
64.	Water bath digital
65.	Stethoscope
66.	Pill tiles
67.	Measuring glass plastic
68.	Measuring glass 2 oz
69.	Measuring glass 10 ml

70.	Measuring glass 250 ml
71.	Glass rod
72.	Gas cylinders
73.	Glass box
74.	Revolving stools
75.	Frog heart clip
76.	Curve needle
77.	Refrigerator
78.	Fire extinguisher

LIST OF CHEMICALS PHARMACOLOGY DEPARTMENT

<u>Sr.No</u>	<u>Nomenclature</u>
1.	Aspirin
2.	Caffeine
3.	Paracetamol
4.	Thread
5.	Wax
6.	Cotton
7.	Sulphur powder

8.	Vaseline
9.	Spirit ammonia aromatica
10.	Tincture Cardimum
11.	Chloroform
12.	Sodium bicarbonate
13.	Potassium permanganate
14.	Sodium chloride
15.	Dextrose
16.	Kymograph papers
17.	Plasticine
18.	Barium chloride
19.	Potassium chloride
20.	Calcium chloride
21.	Drip sets
22.	Kymograph pen
23.	Atropine
24.	Syringes 3 ml
25.	Syringes 5 ml
26.	Acetylcholine

27.	Sodium dihydrogen phosphate
28.	Magnesium chloride
29.	Oxalic acid
30.	Lignocaine injection
31.	Rubber tube
32.	Polythene bags
33.	Methylated spirit
34.	Graph papers
35.	Castor oil
36.	Bismuth carbonate
37.	Gum acacia
38.	Gum tregacanth
39.	Pulv create aromatic
40.	Turpentine oil
41.	Camphor
42.	Soft soap
43.	Spirit chloroform
44.	Ammonium bicarbonate
45.	Tincture ipecac

46.	Extract of liquorices
47.	Sodium citrate
48.	Hydrochloric acid
49.	Hard soap
50.	Surgical gloves
51.	Face mask
52.	Syrup zingibarus

SUMMATIVE ASSESSMENT METHODS & POLICIES

Internal Assessment

- a. Students will be assessed at the end of each block. The weighting of internal assessment is 20% in 2nd professional BDS Examination.
- b. The Internal Assessment shall comprise of results of block exams, Send-up exam and monthly tests taken.
- c. The Internal Assessment record shall be kept in the respective department of the College / Institute and after approval of Principal, a summary as per university registration number shall be furnished to the Controller of Examinations, at least two weeks before the commencement of final examination.
- d. The result of all the class tests / tools which contribute towards IA will be displayed to the students during an academic year.
- e. The same internal assessment shall be counted both for annual and supplementary examinations. The students who are relegated, however, can improve the internal assessment during subsequent year
- f. Internal assessment tools of any subject may be changed after the approval of respective FBS

Annual Examination

- a. The weightage of Annual Examination shall be 80%, each for theory and practical, in BDS.
- b. The examination comprises of a theory paper and practical examinations as per PM&DC regulations and the Table of Specifications (TOS) of the University.
- c. The gap between two consecutive theory papers shall not be more than two days.

The Theory Paper shall be of 3-hours duration, held under the arrangements of the university. It shall have two parts; MCQs (50%) and SAQs/SEQs (50 %) for the year 2023. It may be changed after the approval of Academic Council

Multiple Choice Question (MCQs)

- A multiple choice question (MCQ) consist of a stem that states the question or problem followed by a set of possible answers that contain an option that is best answer to the question.
- After reading the questions students should select the appropriate option from the given possible answers.
- The correct answer carries one mark and incorrect carries zero. There is no negative marking.

Sample MCQ

Which one of the following beta blockers has non-selective action on heart?

- a) Acebutolol
- b) Atenolol
- c) Metoprolol
- d) Propranolol

key: d

Short essay question (SEQs)

- Short essay questions require students to present written answers that are used to asses basic knowledge of key facts and provide students with an opportunity to demonstrate reasoning and explain their understanding of the subject.

Sample SEQ

A hypertensive patient is prescribed Angiotensin receptor blocker (ARB) for managing blood pressure. It remains uncontrolled even after two weeks and the physician decides to add a Thiazide diuretic for combination therapy.

- a. What were the possible side effects if the physician had decided to increase the dose of ARB keeping patient on monotherapy? (3 marks)
- b. What is the mechanism of action of Thiazide diuretics to control blood pressure? (4 marks)

Key:

a) **Side effects of ARB:**

Dizziness, headache, weakness, muscle cramps, insomnia, nausea , vomiting, diarrhea, low potassium level, low blood pressure

b) **Mechanism of action of Thiazide diuretics:**

It reduces blood pressure by acting on the kidneys to reduce sodium (Na^+) reabsorption in the distal convoluted tubule, thereby leading to natriuresis and decreasing blood volume. It also reduces peripheral vascular resistance.

Internal Examiner

He/she shall be Professor and Head of Department who has been involved in teaching of the class being examined for at least six months. Second preference shall be Associate/Assistant Professor who is involved in teaching of the class and posted there for one year. Third preference shall be a recognized Professor of the subject.

External Examiner

He/she shall be a Professor/Associate Professor of a recognized Medical/Dental College or at least an Assistant Professor with three years teaching experience in the relevant subject.

Conflict of Interest

No person shall serve as an examiner whose close relative (wife, husband, son, daughter, adopted son, adopted daughter, grand-son, grand-daughter, brother, sister, niece /nephew, son and daughter- in-law brother and sister- in-law, parental and maternal uncle and aunt etc) is

appearing in the examination. All examiners likely to serve as an examiner shall render a certificate in compliance to this para.

Paper Setting

- a. Each College / Institute shall forward a set of two question papers as per TOS along with the key for each subject to the Controller of Examinations, at least three months in advance of the annual examination. The question paper as a whole / a question without a comprehensive key shall not be considered towards final paper setting.
- b. The set of question papers shall be prepared by the respective Head of Department (HoD) and furnished to Controller of Examinations through Head of Institution (HoI)
- c. The Controller of Examinations shall approve the faculty for the final paper setting having fair representation of each college / institute.

Paper Assessment

- a. The Controller of Examinations shall approve the faculty for the theory paper marking, to be undertaken in the manner as deemed appropriate.
- b. The Examination Directorate shall coordinate directly with the faculty, earmarked for the paper marking
- c. A student who scores 85% and above marks in any subject shall qualify for distinction in that particular subject.
- d. A fraction in aggregate marks of a subject shall be rounded off to whole number. If it is less than 0.5 then it will be rounded off to the previous whole number while 0.5 or more will be rounded off to the next whole number.

Practical / Clinical Examinations

- a. The Controller of Examiners shall approve the faculty to serve as the internal & external examiners.
- b. The number of external and internal examiners shall be equal.
- c. One external & internal examiner each shall be marked for a group of 100 students.
- d. Candidates may be divided into groups in the clinical and practical examinations and be standardized by incorporating clinical exam
- e. Practical/clinical examination shall be held after the theory examination of the subject but in special cases, it may be held before the theory examination with the approval of the Controller of Examinations. For the purpose of practical/clinical examination, the candidates may be divided into sub groups by the examiners.
- f. The assessment of the practical / clinical examination duly signed by internal & external examiner shall be furnished to the Controller of Examinations within one week of the conclusion of examination

Pass Marks

- a. Pass marks for all subjects less Islamic / Pakistan Studies, shall be 50 % in theory and practical, separately.
- b. Pass marks for Islamic / Pakistan Studies shall be 33 % which, however shall not be counted towards final scoring of the professional examination.
- c. No grace marks shall be allowed to any student in any examination.

Declaration of Result.

Every effort shall be made to declare the result of each examination within one month of the last practical examination or earlier.

Promotion.

No student shall be promoted to the higher classes unless he/she passes all the subjects of the previous class

Re-Totaling.

Any student may apply to the Controller of Examinations on a prescribed form along with the specified fee.

Supplementary Examination.

The interval between a supplementary examination and the previous professional examination shall not be more than two months. There shall be no special supplementary examination.

Second Professional BDS Examination 2023

Pharmacology & Therapeutics

Theory:

Marks of theory paper = 80

Time Allowed = 03 hrs

Internal assessment (20%) = 20

Total Marks (MCQs:40%+SEQs:40%+IA:20%) = 100

Pass Marks = 50

Paper-1: (*Marks of MCQ component shall be rationalized to 40% weightage)

60 x MCQs (1 mark each) (60 Marks) Time =60 min

Paper-2:

8x SEQs/SAQs (05 Marks Each) (40 Marks) Time = 120 min

*If a candidate obtains 50 marks in MCQs it will be rationalized as: $(50/60 \times 40 = 33.33)$

Internal Assessment Calculation (Theory Annual)

Exams	Weightings	Exams	Percentage
End of Block & Pre-annual Exams	80%	End of Block Exam - I	20
		End of Block Exam - II	20
		End of Block Exam- III	20
		Pre-Annual Exam	20
Modular/ Class Performance	20%	Class Tests	20
Total	100%		100%

Table of Specifications for Annual Professional Exam: Practical

VIVA 50 marks		Practical (OSPE + Practical Note Book) 40 marks		Total
Examiner 1	Examiner 2	OSPE	Practical Notebook	
20 Marks	20 Marks	35Marks	05 Marks	80 Marks

Internal Assessment Calculation (Practical)

Exams	Weightings	Exams	Percentage
End of Block & Pre-annual Exams	80%	OSPE/ PPT/ Assignments	60
		Pre-Annual Practical	20
Class Performance	20%	SGD/ CBL/ PBL/ Practical	20
Total	100%		100%