



**Institute of Dentistry,**  
**CMH Lahore Medical College**

***Study Guide***

**Department of Pharmacology**  
**2<sup>nd</sup> Year BDS**  
**2022**

### **Mission Statement**

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 of 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.

## **Introduction to Pharmacology Department**

The department is headed by Prof. Dr. Rabiea Bilal 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.

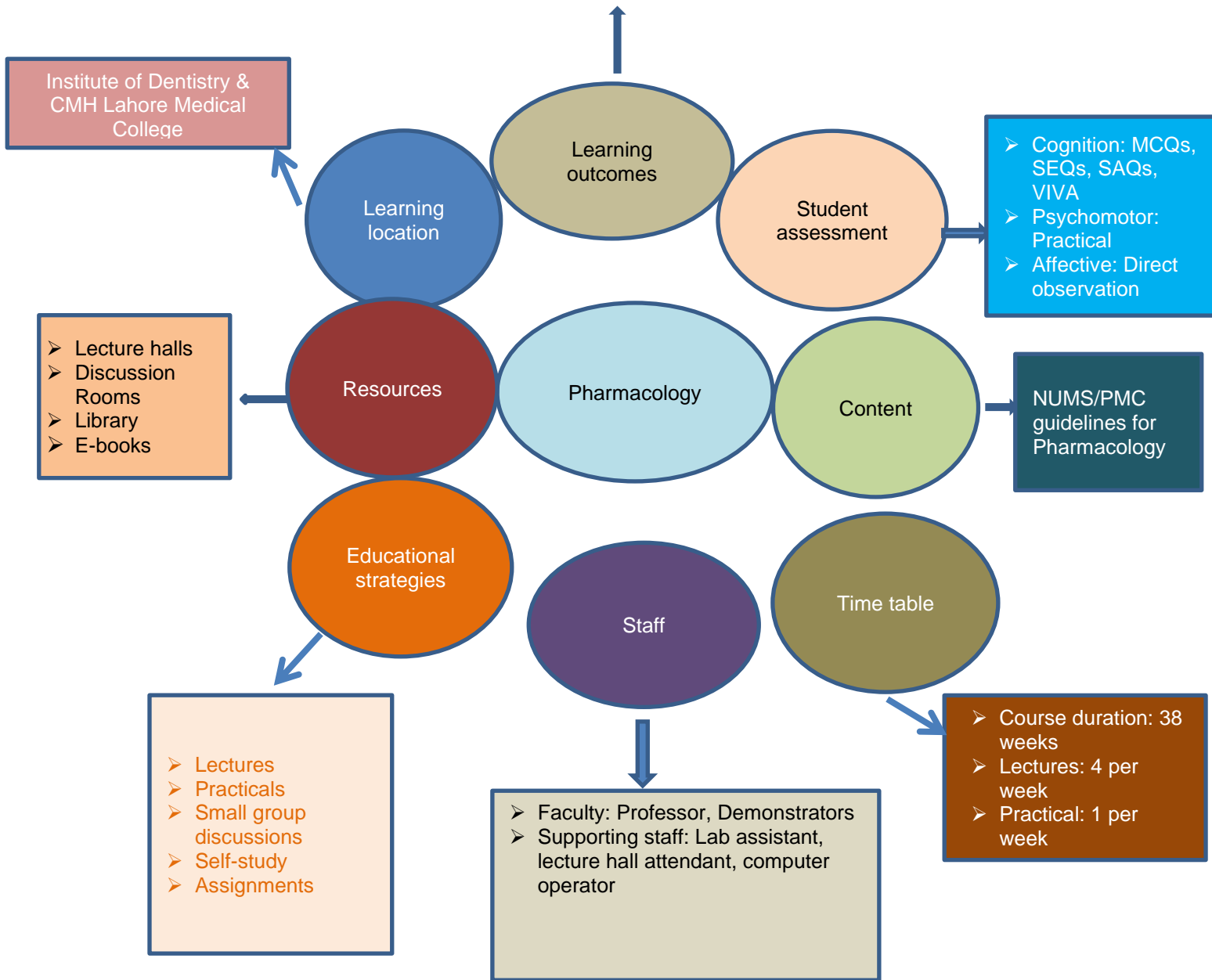
This course will comprise three core teaching blocks and a self-directed learning block involving independent and group work.

### **Aim**

- 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 2<sup>nd</sup> year, BDS students should be able to co-relate basic concepts of Pharmacology with practical work/clinical skill



## 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
<b>BDS Faculty</b>						
1	Prof. Dr. Rabiea Bilal	HoD (IOD)	MBBS, M.Phil, Ph.D	42001-P	13 yrs	C
2	Dr. Sehrish Zaffar	Assistant Professor	MBBS, M.Phil	63677-P	5 yrs 11 months	C
3	Dr. Isma Ishaq	Demonstrator	BDS	20065-D	2 yrs 4 months	C
4	Dr. Afnan Talat	Demonstrator	MBBS	109479-P	3 months	C
5	Dr. Hira Akbar	Demonstrator	BDS	B-27100-D	3 months	C

## B. 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	Iqbal Shahzad	Head Lab Attendant	Matric	40 yrs	C
2	Bilal Ashraf	Lab Technician	B.A, B.Ed	10 yrs 5 months	C
3	Muhammad Akbar	Store Keeper	Fsc	10 yrs 6 months	C
4	Jahangir Masih	Office Orderly	Matric	17 yrs 2 months	C

B. Supporting staff

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

C. Infrastructure resources

<b>Sr. #</b>	<b>Infrastructure resources</b>	<b>Quantity</b>
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
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### **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:**

Prof. Dr. Rabiea bilal (Professor of Pharmacology-IOD), Prof. Dr. Aisha Talat (Professor of Pharmacology), Dr. Javeria Arshad (Associate Professor of Pharmacology), Dr. waqar Ahmad Saddiqui (Associate Professor of Pharmacology), Dr. Sehrish Zaffar (Assistant Professor of Pharmacology-IOD).

### **Practical demonstrators & tutorials conducted by:**

Dr. Isma Ishaq, Dr. Afnan Talat, Dr. Hira Akbar, Dr. Hira Tanveer, Dr. Omar Asghar, Dr. Osama Ashfaq, Dr. Moaz Bin saeed, Dr. Maryam Shah , Dr. Alishba Kalsoom Rauf, Dr. Nabgha Bukhari, Dr. Syed Imran Haider.

### **Support staff:**

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

### **Time Frame**

*(During lockdown Mar 2021 to May 2021 schedule)*

Course duration: 38 weeks

Lectures Zoom Online: Monday, Tuesday, Wednesday, Friday (12:00 to 12:50) and fortnightly

Small group discussions (15:00 to 17:00 pm)

LMS Quiz & Discussions, WhatsApp small group discussions

Practicals Pharmacy: On college re-opening

## **Time Frame**

*(After lockdown June 2021 onwards schedule)*

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)

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

## **Learning Outcomes of Pharmacology for 2<sup>nd</sup> 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 2<sup>nd</sup> Year  
Pharmacology & Therapeutics**

**Curriculum Document BDS 2<sup>nd</sup> Year  
Pharmacology & Therapeutics  
Term 1 & 2=16 weeks each and pre-annual revisions=6weeks  
Total session=38 weeks**

**Pharmacology First Term (Duration 16 weeks)**

Sr. No.	Theme	Contents	Learning objectives	Learning outcomes	Domain of Learning	Learning resource	Mode of Information Transfer
	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 Biotransformation of drugs Factors modifying biotransformation Bioavailability: 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 & doses of drugs	-To review the pharmacodynamic and pharmacokinetic concepts of drug action. It will examine and interpret modern strategies of drug discovery in the pharmaceutical industry and molecular mechanisms of drug	Interpret the different pharmacokinetic patterns, their clinical significance and factors affecting these parameters. Correlate the concept of molecular mechanistic to the therapeutics. Identify the genetic principles in drug disposition	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals
	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	-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, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)

		<p>Non Catecholamines: Ephedrine, Amphetamines <math>\alpha/\beta</math>2 receptor agonists etc Adrenergic Blockers: Alpha-receptor Blockers, Beta receptor Blockers Central Sympathoplegics Skeletal Muscle Relaxants Drug treatment of glaucoma</p>					
Drugs acting on CVS	<p>Revisiting physiology of CVS Cardiotonic drugs: Management of cardiotoxicity of cardiac glycosides Antihypertensive drugs Drug Treatment of IHD Anti arrhythmic drugs</p>	<p>This unit aims to extend student's knowledge and understanding of cardiovascular pharmacology Particular emphasis will be placed upon personalising treatments for patients with heart disease.</p>	<p>Relate the pathophysiology of heart and vessels to its treatment modalities</p>	C1, C2, C3	<p>Multimedia, Textbooks, Library, Recommended websites</p>	<p>Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)</p>	
Drugs acting on blood	<p>Haematinics Anticoagulants Thrombolytic Anti-platelets Anti-Hyperlipidemics Diuretic</p>				<p>Multimedia, Textbooks, Library, Recommended websites</p>	<p>Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)</p>	

**Pharmacology Second Term (Duration: 16 weeks)**

Central Nervous System	<p>Central Neurotransmission Gen Anesthetics Local Anesthetics (LA) Aliphatic Alcohols Sedatives/ Anxiolytics &amp; Hypnotics Anti-epilepsy drugs Antipsychotic drugs Anti-</p>	<p>Clinical Practice Oriented discussion of Neuro-pharmacology</p>	<p>Correlate the pathophysiology of psychiatric illnesses to their management Differentiate</p>	C1, C2, C3	<p>Multimedia, Textbooks, Library, Recommended websites</p>	<p>Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)</p>
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	depressants Drugs used in Parkinsonism Drug treatment of Migraine Non Narcotic Analgesics a. Non-steroidal Anti-inflammatory drugs (NSAIDs) b. Drugs used in gout. c. DMARDs/Biological Agents Opioids Drug Dependence		between different pharmacological agents (LA, GA, opioids, NSAIDs) used in the pain management Justify the use of antiparkinson drugs 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 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			
Chemotherapy-I	Introduction & General Principles of Chemotherapy Mechanism of Resistance Penicillins Cephalosporin Sulfonamides Macrolides	Integrative study of drugs, their mechanism of action, and	Justify the treatment modalities for various microbes	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals

	Tetracyclines Chloramphenicol Aminoglycosides Quinolones 50 11 Anti-tuberculosis drugs Misc Drugs: Clindamycin, Fusidic acids, vancomycin, Nitrofurantoin, Linezolid	their side effects in the treatment of major diseases and pathologies of infectious diseases & chemotherapy .	(bacteria, viruses) according to mode of action, resistance patterns and regional current practices Illustrate the principles of cancer chemotherapy in relation to its current therapeutic modalities			(Prescription Writing)
Chemotherapy-II	Anti fungal drugs Anti viral drugs Anti Malarial Anti AmoebicsAnthelmintics		Justify the treatment modalities for various microbes (helminths, parasites) according to mode of action, resistance patterns and regional current practices-II	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)
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.			
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 respiratory system	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)	
Drugs acting on GIT	Anti emetics Antidiarrhoeals Purgatives/laxatives Drugs used in Peptic Ulcer	Integrative study of drugs, their mechanism of action, and their side effects in the treatment of major diseases and pathologies of Gastrointestinal system	Develop and illustrate the management plan of common disorders of gastrointestinal tract (peptic ulcer, vomiting, constipation, gastropathies, diarrhea).	C1, C2, C3	Multimedia, Textbooks, Library, Recommended websites	Lectures, Tutorials, Small Group Discussions, Practicals (Prescription Writing)	

## LIST OF PRACTICALS 2<sup>ND</sup> YEAR BDS PHARMACOLOGY

### 1. PHARMACY (COMMON DRUGS PREPARATIONS):-

- Lotion                       $\text{KMnO}_4$
- Emulsion                  castor oil
- Liniment                  turpentine oil
- Ointment                  sulphur
- Solutions                   $\text{KMnO}_4 + 5\%$  dextrose in normal saline
- Powder                    APC (aspirin, paracetamol, caffeine) and ORS
- Mixture                    carminative mixture/ $\text{NaHCO}_3$  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 CALCULATIONS ARE NOT INCLUDED:-

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

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

## Learning Resources

### 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
“	-	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: <a href="https://www.pharmacology2000.com/">https://www.pharmacology2000.com/</a>	
“	<a href="https://alison.com/courses/pharmacology">https://alison.com/courses/pharmacology</a>	
	<a href="https://www.classcentral.com/institution/moodle">https://www.classcentral.com/institution/moodle</a>	

## 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**

<b>Sr.No</b>	<b>Nomenclature</b>
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.	Tyrod 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**

<b><u>Sr.No</u></b>	<b><u>Nomenclature</u></b>
1.	Aspirin
2.	Caffeine
3.	Paracetamol
4.	Thread
5.	Wax
6.	Cotton
7.	Sulphur powder
8.	Vaseline
9.	Spirit ammonia aromatica
10.	Tincture Cardium
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 2022. 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<sup>+</sup>) 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.

**Table of Specification 2021  
Second Professional BDS Examination  
Pharmacology & Therapeutics**

**Theory**  
**Time allowed:** =03 hrs. (including MCQs)  
**Marks of theory Paper** =80  
**Internal Assessment** =20  
**Total Marks** = 100  
**Pass Marks** =50

**Paper 1**  
**40 x MCQs** (40 marks) Time =1 hour

**Paper 2**  
**Q. No. 1.2.3.4.5.6.7.8.9**  
**7 x SAQs/SEQs (Recall)** = 05 marks each  
**1 x SAQs/SEQs (Application)** = 05 marks

**Total Marks** = 40 marks Time = 2 hours

S.No	Topic	Number of MCQs 40 Recall: 35 Application: 05 1 mark each	Number of SAQs/SEQs (08) 05 Marks each
1.	Gen Pharmacology	05	01
2.	ANS	05	01
3.	CNS/Opioids/NSAIDs	08	01
4.	Local anesthetics	04	01
5.	Chemo	05	01
6.	CVS/Diuretics/Blood	05	01
7.	Respiratory /GIT	04	01
8.	Endocrinology	04	01
<b>Total</b>		<b>40 (40 marks)</b>	<b>08 (40 marks)</b>

**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
<b>Total</b>	<b>100%</b>		<b>100%</b>

**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	<b>80 Marks</b>

**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
<b>Total</b>	<b>100%</b>		<b>100%</b>

