BACHA KHAN MEDICAL COLLEGE, MARDAN

FOUNDATION II MODULE (5 WEEKS)

STUDY GUIDE

3RD YEAR MBBS

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MISSION STATEMENT

BACHA KHAN MEDICAL COLLEGE IS COMMITTED TO TRAIN STUDENTS TO BECOME KNOWLEDGEABLE, SKILLFUL AND EMPATHETIC TO MEET THE NEEDS OF SOCIETY WITH EMPHASIS ON RESEARCH PROFESSIONALISM AND HEALTH ADVOCACY.

VISION STATEMENT

BECOME A PROMINENT REGIONAL HEALTH CARE CENTER FOCUSED ON IMPROVING INDIVIDUAL AND COMMUNITY HEALTH AND ACHIEVING NATIONAL AND INTERNATIONAL STANDARDS OF EXCELLENCE.

BKMC OUTCOMES

At the end of graduation, BKMC graduates should be able to

1. Apply core medical and scientific knowledge to individual patients, populations and health systems
2. Demonstrate a commitment to excellence, evidence-based practice and the generation of new scientific knowledge.
3. Demonstrate by listening, sharing and responding, the ability to communicate clearly, sensitively and effectively with patients, their family, doctors and other health professionals.
4. Elicit an accurate, organized and problem focused medical history, including family and social occupational and lifestyle features, from the patient and other sources.
5. Describe health policy and planning
6. Demonstrate preventing practices related to communicable, non-communicable diseases and injuries.
7. Explain the socio-economic determinants of health-related events.
8. Demonstrate all the attitudes of medical professionalism and bio ethics.

INTRODUCTION TO STUDY GUIDE

This study guide is designed for MBBS undergraduate student of BKMC to provide them a resource material that will highlight the important aspects of curriculum to make them self-regulated lifelong learners.

This study guide will give an overview of course outcomes and objectives in relation to course content.The assessment methodologies along with blue-printsare also provided.

This study guide has been carefully designed, keeping in view PMC and KMU curriculum and guide lines. Dedicated effort by faculty is done to make this guide tailored to student's needs.

INTRODUCTION TO THE MODULE

The Bacha Khan Medical College Foundation II Module is designed to provide both basic and clinical knowledge and skills to the medical students. The module is aligned to the general outcomes required at the exit level, and includes sessions on preventive medicine, medico legal, communication skills, professionalism, self-management, and developing scholarly skills.

This module will be of 5 weeks duration and the assessment will be carried out through MCQs and OSPE.

LIST OF DEPARTMENT FACULTY

PATHOLOGY DEPARTMENT:

S.NO	NAMES	DESIGNATION
1.	DR. Mohtasim Billah	Professor
2.	DR. Nazish Farooq	Professor
3.	DR. Komal	Assistant professor
4.	DR. Zarmina	Assistant professor
5.	DR. Khalida	Assistant professor
6.	DR. Zahir shah	Senior lecturer
7.	DR. Sadia Imad	Senior lecturer
8.	DR. Zainab	Lecturer
9.	DR. Ayesha Gohar	Lecturer
10.	DR. Mashal Riaz	Lecturer
11.	Dr. Jawad Ahmad	Lecturer

MODULAR COMMITTEE FOR FOUNDATION II MODULE

Module Coordinator:	**Dr. Khalida Kousar (Pathology) (0335-9271962)**
Co Coordinators:	**Dr. Abdullah (Forensic Medicine)** **Dr. Fazli Rabbi (Pharmacology)** **Dr. Huma Habib (Community Medicine)** **Mr. Muhammad Arif (J.Clerk Pathology)**
Medical Educationist:	**Dr. Imtiaz ud Din (0332-9485318)**

List of Themes

Total Duration: 5 weeks

Theme	Duration
Molecules and Bacteria	3 weeks
Cell injury, Ageing and Death	2 weeks

General learning Outcomes

By the end of Foundation-2 Module, 3rd year MBBS students will be able to:

1) Define pathology, its different branches and enumerate clinically important bacteria.
2) Describe the structure of bacterial cell and mechanisms by which they cause the disease.
3) Describe methods used to identify different microbes in laboratory and explain the interventions employed to prevent infections including vaccines.
4) Describe cell injury, its different mechanisms and sub cellular responses to cell injury.
5) Describe necrosis, apoptosis and adaptive changes seen in clinical settings and its identification in surgical specimens.
6) Define common terms related to Pharmacology.
7) Describe the basic principles of pharmacokinetics and pharmacodynamics and apply these principles to clinical practice as they relate to drug absorption, distribution, metabolism, excretion, mechanism of action, clinical action and toxicity.
8) Describe the cellular and biochemical sites where drugs bind to act.
9) Describe the general principles of drug interactions in relation to clinical practice.
10) Describe the process of new drug development.
11) Identify different dosage forms of drugs.
12) Demonstrate searching accurate information quickly in a formulary.
13) Demonstrate administration of a drug through intramuscular and intravenous routes.
14) Write down the basic format of drug prescription and describe the general principles of prescribing drugs.
15) Write correctly medical abbreviations used in clinical practice.
16) Identify commonly used equipments in Pharmacy.
17) Describe Forensic medicine, its different branches and importance.
18) Describe law and its various components.
19) Describe autopsy, its protocols and related hazards.
20) Describe different refractive errors and its management.
21) Explain causes of watery eyes in both infants and elders and its management.

22) Describe the basic concept of health, disease and primary health care.
23) Demonstrate different pathological laboratory procedures and identify gross and microscopic features in the given specimens.
24) Demonstrate professionalism, respect, honesty and compassion by behaving in a courteous manner with colleagues and teachers during course activities like long lectures, SGDs and Practicals.
25) Describe the PMDC code of Ethics
26) Describe the steps of process of developing a research protocol

Specific Learning Objectives

Theme-1 (Molecules and Bacteria)			
Subject	**Topic**	**Sr.**	**Learning objectives** **At the end of this module, the students of year-3 will be able to:**
Pharmacology	Introduction to the subject	1	Define basic terms like Pharmacology, Clinical Pharmacology, Therapeutics, drug, medicine, pro-drugs, prototype drugs, Materia medica, pharmacopoeia, poisons, toxins, pharmacokinetics, pharmacodynamics, excipient (vehicle), compounding and dispensing.
		2	Describe the branches of Pharmacology like Pharmacy, Pharmacognosy, pharmacogenetics, pharmacogenomics, toxicology and posology.
		3	Define prescription drugs, OTC drugs, WHO essential drugs and Orphan drugs with examples.
	Nomenclature of drugs	4	Describe how drugs are named, i.e. chemical, generic, approved, official and trade names of drugs with examples.
	Sources of drugs	5	Enlist various sources of drugs.

		6	Give examples of drugs obtained from plants, animals, mineral and synthetic sources.
		7	Describe the genetic engineering source of drugs with examples.
	Active principles of crude drugs	8	Enlist important principles of crude drugs with examples.
	Routes of drug administration	9	Enlist various routes of drug administration.
		10	Describe the merits and demerits of oral, sublingual, rectal, intramuscular, subcutaneous, intravenous, intra-arterial, inhalational, spinal, topical and transdermal routes of drug administration.
		11	Give examples of drugs given through oral, sublingual, rectal, intramuscular, subcutaneous, intradermal, intravenous, intra- arterial, inhalational, spinal, topical and transdermal routes of drug administration.
		12	Describe the difference between topical and transdermal routes of drug administration.
		13	Describe the difference between subcutaneous and intradermal routes of drug administration.
	Absorption of drugs	14	Define drug absorption.
		15	Describe various mechanisms of drug absorption like simple

			diffusion, facilitated diffusion, active transport, ion-pair transport, endocytosis and filtration with examples.
		16	Describe the concept of ionization of drug molecules and clinical significance of ion trapping.
		17	Describe factors affecting drug absorption.
	Bioavailability and Bioequivalence	18	Define bioavailability, bioequivalence and pharmaceutical equivalence.
		19	Explain Time-Concentration curve.
		20	Describe AUC (Area Under the Curve).
		21	Describe the factors affecting bioavailability.
	Hepatic first- pass effect (Pre-systemic elimination)	22	Describe hepatic first-pass effect (Pre-systemic elimination) and its clinical significance.
	Enterohepatic circulation	23	Define enterohepatic circulation.
		24	Describe enterohepatic circulation with examples and its clinical significance.
	Distribution of drugs	25	Define distribution of drugs.
		26	Define redistribution of drugs with example.

		27	Describe plasma protein binding and its clinical significance in diseased conditions.
		28	Describe factors affecting drug distribution.
	Volume of distribution	29	Define volume of distribution.
		30	Enlist drugs with small volume of distribution.
		31	Enlist drugs with large volume of distribution.
		32	Apply formula for calculating volume of distribution.
		33	Describe volume of distribution with reference to its clinical significance.
	Loading dose	34	Define loading dose of a drug.
		35	Enlist some drugs whereby loading dose is administered.
		36	Apply formula for calculating loading dose.
	Physiological barriers to Transport of drugs	37	Enlist important physiological barriers to transport of drugs.
		38	Describe important physiological barriers to transport of drugs like blood-brain barrier and placental barrier with reference to their clinical significance.
	Biotransformation	39	Define biotransformation.

	(metabolism) of drugs		
		40	Define xenobiotics.
		41	Describe the objectives of biotransformation and fate of drugs after biotransformation.
		42	Name major sites of biotransformation.
		43	Describe major drug metabolizing enzymes i.e. microsomal (P450) and non-microsomal enzymes.
		44	Describe the phases and reactions of biotransformation.
		45	Describe the factors affecting drug Biotransformation.
	Genetic influence on biotransformation of drugs	46	Define pharmacogenetics and pharmacogenomics.
		47	Define idiosyncrasy with examples.
		48	Describe the genetic factors influencing biotransformation of drugs with examples.
	Enzyme induction	49	Define enzyme induction.
		50	Enlist enzyme inducers.
		51	Describe enzyme induction and its clinical significance.
	Enzyme inhibition	52	Define enzyme inhibition.
		53	Enlist enzyme inhibitors.

		54	Describe enzyme inhibition and its clinical significance.
		55	Describe suicide inhibition (mechanism-based inhibition) with examples of drugs.
	Excretion of drugs and drug clearance	56	Define drug excretion and drug clearance.
		57	Enlist major and minor routes of drug excretion.
		58	Differentiate between excretion, elimination and clearance.
		59	Apply the formula for calculating drug clearance.
	Maintenance dose	60	Define maintenance dose of a drug.
		61	Apply the formula for calculating the maintenance dose.
		62	Apply Young's formula, Dilling's formula and Clark's formula for calculating doses of drugs.
	Plasma half life	63	Define plasma half-life.
		64	Enlist drugs with short half-life.
		65	Enlist drugs with long half-life.
		66	Apply the formula for calculating plasma half-life.
		67	Explain the clinical significance of half-life.
	Steady-state concentration of drugs	68	Define steady-state concentration of drugs.

		69	Describe the time to reach steady-state concentration of drugs.
		70	Describes the importance of steady-state concentration in clinical practice.
	First- and zero-order kinetics	71	Define first- and zero-order kinetics.
		72	Differentiate between first- and zero-order kinetics with examples.
		73	Explain the clinical significance of first- and zero-order kinetics
	Bioassay and standardization	74	Define bioassay and standardization.
		75	Describe the relative importance of bioassay compared with physical or chemical assays.
		76	Describe the most common type of bioassay, i.e. three-point assay.
Pathology	Introduction to the subject	77	Define pathology, microbiology and list its major branches
		78	Describe essential characteristics of five major groups of microorganisms
		79	Differentiate between prokaryotes and eukaryotic cells based on their structure and complexity of their organization
	Introduction to cell	80	Define cell
		81	Describe structure of cell membrane
		82	Describe cell organelles

	Classification of Bacteria	83	Describe classification of bacteria based on oxygen requirement as aerobes and anaerobes with examples.
		84	Describe classification of bacteria based on staining characteristics, nature of cell wall, ability to grow in the presence of oxygen and ability to form spores.
	Structure of bacterial cell	85	Describe structure and function of each of various parts of the bacterial cell including cell wall, cytoplasmic membrane, Mesosome, ribosomes, granules and nucleoid
		86	Describe specialized structures outside the cell wall including capsule, flagella, pilli and glycocalyx
		87	List the differences between cell wall characteristics of Gram Positive and Gram Negative Bacteria
		88	Describe classification and important functions of plasmids.
		89	Describe functions and arrangement of transposons.
		90	Describe structure, functions and medical importance of bacterial spores with examples.
	Bacterial growth curve	91	Describe various phases of bacterial growth curve
	Normal Flora	92	Describe medically important members of normal flora and their anatomic location

	Bacterial genetics	93	Define mutation
		94	Describe the classification of various types of mutations and their common causes.
		95	Describe methods of transfer of DNA within bacterial cells including process of conjugation, transduction, recombination and transformation.
	Lab diagnosis of bacterial infections	96	Describe the bacteriologic approach to diagnosis of bacterial infections including blood, throat, stool, sputum, spinal fluid, urine, genital tract and wound cultures.
		97	Describe general principals of various immunologic and nucleic acid based methods for identification of an organism.
	Bacterial pathogenesis	98	Define the term pathogen, infection, virulence, communicable, endemic, epidemic and pandemic diseases, carrier, pathogens, opportunists, commensals and colonizers.
		99	Describe stages/determinants of bacterial pathogenesis.
		100	Describe colonization, invasion, toxins, immune-pathogenesis.
		101	Differentiate between exotoxins and endotoxins.
		102	Describe the various modes of action of endotoxins and endotoxins

			produced by gram positive and gram-negative bacteria.
		103	Describe the four stages of a typical infectious disease and Koch's postulates for establishing the causal role of an organism in the disease.
	Antibacterial Vaccines	104	Define immunization and vaccination.
		105	Describe role of immunization in inducing active and passive acquired immunity.
		106	Enlist the current bacterial vaccines and their indications.
		107	Describe various types of bacterial vaccines in terms of composition, preparation, indications, route of administration and common side effects.
Forensic medicine	Introduction to the subject of Forensic Medicine	108	Describe forensic medicine and its various branches
		109	Describe pillars of forensic medicine
	Introduction to Law	110	Define law.
	Introduction to medicolegal system	111	Describe code of medical ethics
		112	Describe the terminology in forensic medicine

		111	Discuss different prevailing medicolegal systems in the world
		114	Describe its various types.
		115	Describe the relevant sections of Pakistan penal code and CrPC
		116	Describe court procedures
	Chain of evidence	117	Describe evidence, its types and recording of evidence.
	Medical jurisprudence	118	Describe laws in relation to medical practice
		119	Describe the components of medical jurisprudence (consent, negligence, secrecy, professional misconduct and privileged communication)
ENT	Introduction to the subject	120	Describe common ENT symptoms.
		121	Name common diseases of ENT.
		122	Name recommended books that students must read.
Ophthalmology	Introduction to the subject; Career in Ophthalmology	123	Define Ophthalmology and its branches
		124	Highlight the scope of field of Ophthalmology as a future career
	Refractory errors	125	Describe refractive error and its effect on vision.
		126	Describe the concept of myopia and its correction.

		127	Describe the concept of hypermetropia and its correction.
		128	Describe the concept of astigmatism & cylindrical lens.
		129	Describe the concept of presbyopia, it's possible causes and correction.
		130	Describe aphakia and possible methods of its correction.
	Watery Eyes	131	Explain the structural details, development and functions of lacrimal system.
		132	Correlate the clinical presentation of watery eye with anatomical structures.
		133	Correlate the clinical features with a disease entity.
		134	Describe the causes, clinical features and treatment of congenital nasolacrimal duct obstruction.
		135	Assess the time of probing.
		136	Describe the causes, clinical presentation and treatment modalities.
		137	Differentiate between acute and chronic dacryocystitis.
Community Medicine	Introduction to the subject	138	Define Community medicine and Public health
		139	Describe the role of teaching of public health in prevention of diseases

	Health and disease	140	Define community medicine, public health and preventive medicine.
		141	Discuss the history and philosophy of public health as well as its concepts and functions regionally & globally.
		142	Describe the stages in the natural history of a disease.
		143	Describe epidemiological triad, web of causation and multifactorial causation
		144	Describe the dimensions and determinants of health
		145	Describe the indicators of health and its characteristics
		146	Discuss the concept of disease control
		147	Discuss the different levels of prevention and their modes of interventions.
		148	Explain the natural history of disease.
		149	Describe the iceberg phenomenon
		150	Describe mode of intervention of diseases with emphasis on health education.
	Primary Health Care	151	Define Primary health care (PHC).
		152	Describe the elements of PHC, its principles and strategies for implementation of PHC.

		153	Describe Health for all by the year 2000.
		154	Enumerate the MDGS & SDGS related to health.
PRIME	Code of ethics	155	Describe PMC`s code of ethics
		156	Compare PMC code of ethics with international code of medical ethics
		157	Describe the composition and functions of PMC
		158	Describe duties of a registered medical practitioner
	Personal identity	159	Describe the parameters and methods of personal identity
	Professional identity	160	Describe professional identity
Theme-2 (Cell injury, Ageing and Death)			
Subject	**Topic**	Sr.	**Learning objectives** **At the end of this module,** **the students of year-3 will be able to:**
Pharmacology	Pharmacodynamics	161	Define pharmacodynamics.
		162	Define agonist, antagonist, partial agonist and inverse agonist with examples.
		163	Describe receptors.
		164	Define orphan receptors, serpentine receptors and spare receptors.
		165	Describe the biochemical and cellular sites of drug targets.

		166	Describe intracellular Second-messenger system and enlist some important Second-messengers.
		167	Describe up regulation and down regulation of receptors with examples.
		168	Define drug selectivity and specificity.
	Dose-response curves (Graded and Quantal)	169	Define dose response curve, graded dose-response curve and quantal dose-response curve.
		170	Describe graded dose-response curve and quantal dose-response curve.
		171	Describe the limitations of graded dose-response curve and its remedy in a quantal dose-response curve.
		172	Describe the significance of constructing dose-response curves.
		173	Explain the advantages of taking log dose values on the dose axis.
	Therapeutic index	174	Define therapeutic index.
		175	Describe therapeutic index with reference to its clinical importance.
		176	Apply formula for calculating therapeutic index.
		177	Define median lethal dose, median toxic dose and median effective dose.
		178	Enlist some drugs with narrow therapeutic index.

		179	Enlist some drugs with broad therapeutic index.
	Protective index	180	Define protective index.
		181	Differentiate between therapeutic index and protective index.
	Therapeutic window	182	Define therapeutic window.
		183	Describe therapeutic window with reference to its clinical importance.
	Potency and efficacy	184	Define potency and efficacy.
		185	Describe potency and efficacy with examples.
		186	Describe the clinical importance of efficacy compared to potency.
	Drug antagonism	187	Define drug antagonism.
		188	Enlist types of antagonism.
		189	Describe chemical, physiological (functional) and pharmacological (competitive/surmountable and non-competitive) antagonisms with examples.
	Drug interactions	190	Define drug interaction.
		191	Define drug incompatibilities with examples.
		192	Describe pharmacokinetic drug interactions with examples and its clinical significance.
		193	Describe pharmacodynamics drug interactions with examples and its clinical significance.

		194	Describe drug-food interactions and drug-disease interactions with examples.
		195	Define summation, synergism and potentiation with examples.
	Tolerance and Tachyphylaxis	196	Define Tolerance, cross tolerance, reverse tolerance (sensitization), innate tolerance, tachyphylaxis and drug resistance.
		197	Describe the mechanisms of development of tolerance and tachyphylaxis.
		198	Define drug holidays with example.
	Adverse drug reactions	199	Define adverse effects of drugs, secondary effects of drugs and intolerance to drugs.
		200	Classify adverse drug reactions.
		201	Describe dose-related adverse effects (side effects and toxic effects) with examples.
		202	Describe non-dose-related adverse effects (idiosyncrasy and drug allergy) with examples.
		203	Describe causes of adverse drug reactions.
		204	Enlist some drugs causing hepatotoxicity.
		205	Enlist some drugs causing renal toxicity.
		206	Enlist some cardiotoxic drugs.
		207	Enlist some drugs causing adverse effects on reproduction.

	New drug development	208	Describe the processes involved in drug discovery and development.
		209	Define lead compound and drug screening.
		210	Describe pre-clinical and clinical studies.
		211	Define placebo, placebo response and nocebo response.
		212	Define no-effect dose and minimum lethal dose.
		213	Describe phases of clinical trials.
		214	Define post-marketing surveillance.
		215	Define single-blind, double-blind, crossover and ADME studies.
		216	Describe the role of Food and Drug Administration (FDA) in the drug development process.
		217	Differentiate between IND (Investigational New Drug) and NDA (New Drug Application).
Pathology	Cellular injury, cell death	218	Define the following terms: Pathology, disease, etiology, pathogenesis, morphology, cell injury and homeostasis.
		219	Describe the causes of cell injury from gross physical trauma to single gene defect.
		220	Describe the nature and severity of cell injury with cellular responses.
		221	Enumerate different classes of pathology.

		222	Describe the following basic mechanisms of cell injury: General Biochemical mechanisms, Ischemic and hypoxic injury, Ischemic/reperfusion injury, Free radical induced cell injury and chemical injury.
		223	Differentiate between reversible and irreversible cell injury.
		224	Describe the mechanism, morphological and biochemical changes and functional alterations in reversible and irreversible cell injury.
		225	Define phagocytosis, endocytosis, pinocytosis, autophagy and heterophagy.
		226	Describe the subcellular responses to injury including lysosomal catabolism, heterophagy and autophagy.
	Cellular adaptation	227	Describe types of cellular adaptations.
		228	Differentiate between physiologic and pathologic adaptation.
		229	Define hypertrophy, hyperplasia, atrophy and metaplasia.
		230	Describe the causes and mechanism of hypertrophy, hyperplasia, atrophy and metaplasia.
		231	Describe hypertrophy of the smooth endoplasmic reticulum with

			examples and mitochondrial alterations.
		232	Describe cytoskeletal abnormalities in pathological states with examples.
	Necrosis	233	Define necrosis.
		234	Describe types of necrosis with examples.
		235	Describe the mechanism and morphology of necrosis.
	Apoptosis	236	Define apoptosis.
		237	Describe physiological and pathological causes of apoptosis with examples.
		238	Describe morphology with alterations in cell structure.
		239	Describe the biochemical features of apoptosis altering the cell structure.
		240	Describe the intrinsic and extrinsic pathways of apoptosis.
		241	Differentiate between necrosis and apoptosis.
		242	Describe role of apoptosis in health and disease.
		243	Describe the mechanism and causes of cellular ageing including genetic & environmental factors, structural & biochemical changes.
		244	Describe adaptive changes in clinical settings.

	Steatosis	245	Describe causes and mechanism of steatosis.
		246	Explain the morphology and consequences of steatosis.
	Intracellular accumulations	247	Describe three general pathways for abnormal intracellular accumulations.
		248	Define steatosis.
		249	Describe causes, mechanism, morphology and consequences of lipid accumulation.
		250	Describe causes, mechanism, morphology, consequences of protein and glycogen accumulation
		251	Describe types of pigments
		252	Differentiate between endogenous and exogenous pigments.
	Pathologic calcification	253	Define Pathologic calcification
		254	Describe types, morphology and functional alterations of pathologic calcification with examples.
		255	Differentiate between dystrophic and metastatic calcification.
Forensic Medicine	Introduction to Thanatology; Death	256	Define death and describe its phases.
		257	Describecriteriaofdiagnosisofdeath.
		258	Define cause, mode, manner and mechanism of death
	Death certificate	259	Describe the WHO format of death certificate

		260	Enlist various methods of disposal of dead body
	Post-mortem changes	261	Enlist immediate, early and late post-mortem changes.
	Death certificate	262	Define cause of death
		263	List the content of international cause of death certificate.
		264	Fill the international cause of death certificate with the help of scenarios.
Ophthalmology	Cataracts	265	Define cataract
		266	Describe the types of cataracts
		267	Describe the pathogenesis and complications of cataracts
		268	Describe the management of cataracts
PRIME	Research Protocol	269	Describe the steps of developing a research protocol
	Health system research	270	Define research and health system research.
		271	List types of research.
		272	Describe characteristics of health system research.
		273	Describe building blocks of health system.
		274	Discuss key areas of concern in health system.
		275	Discuss briefly research methodology.
Practical work			

Pharmacology	Lab protocols; Apparatus used in Pharmacy	276	Describe the general protocols for working safely and efficiently in Pharmacology labs.
		277	Identify common apparatus used in Pharmacy.
	Metrology & Medical abbreviations	278	Define metrology.
		279	Describe Metric and Imperial systems of measurements.
		280	Calculate the equivalency of Metric system with Imperial system.
		281	Describe common medical abbreviations.
		282	Apply these abbreviations correctly in medical documentations.
	Dosage forms of drugs	283	Define dosage form.
		284	Enlist the types of dosage forms.
		285	Describe the characteristic properties of each dosage form.
		286	Identify dosage forms administered through different routes.
	Searching information in a formulary	287	Define formulary.
		288	Describe National Formulary.
		289	Demonstrate searching accurate information quickly in a formulary.
	Demonstration of Intramuscular and Intravenous	290	Describe the general protocols for IM and IV injections of drugs.

	injections of drugs on a dummy (manikin)		
		291	Demonstrate standard protocols during administration of a drug through Intramuscular route.
		292	Demonstrate standard protocols during administration of a drug through Intravenous route.
	Prescription writing	293	Define medical prescription.
		294	Describe the components of a prescription.
		295	Describe how to reduce medication errors.
		296	Define compliance to treatment and describe how to improve it.
		297	Write down the basic format of drug prescription.
Pathology	Biosafety procedures/Precautions in Microbiology Lab	298	Define sterilization and disinfection.
		299	Demonstrate steps of hand washing.
		300	Enlist various physical and chemical methods of sterilization and disinfection.
		301	Define biosafety and biosecurity.
	Tissue processing	302	Describe steps involved in tissue processing.

		303	Identify various tools/instruments involved in tissue processing and their indications.
		304	Demonstrate slide focusing.
	Gram staining	305	Describe principal and significance of Gram staining.
		306	Enlist steps of Gram staining.
		307	Demonstrate Gram staining procedure.
		308	Identify Gram positive and Gram-negative bacteria morphologically under the microscope.
	ZN staining	309	Describe principal and significance of ZN staining.
		310	Enlist steps of ZN staining.
		311	Demonstrate ZN staining procedure.
		312	Identify AFB and inflammatory cells microscopically.
	Culture media	313	Define terms like culture, bacterial colony, media, aerobe, anaerobe, agar, selective and differential.
		314	Describe classification of culture media.
		315	Describe basic and enriched media, transport media, selective media and differential media.
		316	Describe preparation/ inoculation of culture media.
		317	Enlist ingredients, indications, important properties and organisms grown on various culture media.

	Bacterial motility	318	Enumerate motile bacteria
		319	Identify motile bacteria under the microscope
	Hyperplasia (BPH)	320	Define hypertrophy and hyperplasia.
		321	Differentiate between hypertrophy and hyperplasia.
		322	Describe gross and microscopic morphology of BPH.
		323	Identify the slide of BPH.
	Atrophy (Testicular atrophy)	324	Define atrophy
		325	Describe gross and microscopic features of atrophy over a slide of testicular atrophy as an example
	Pathologic calcification	326	Describe causes and various types of calcification.
		327	Identify the slide.
Forensic Medicine	Death certificate	328	Formulate death certificate based on WHO criteria

	Legal procedure	329	Doctor in a witness box- role play
	Recording of evidence	330	Recording of dying declaration
	Consent form	331	Take written informed consent for various procedures

MEDICAL TEACHING INSTITUTION
BACHA KHAN MEDICAL COLLEGE MARDAN

Time Table for 3rd Year MBBS Student (Session 2023—2024)

Foundation II Module **Week 1**

Day/Date	08:00—09:00am	09:00—10:00am	10:00—11:00am	11:00am-01:00pm	01:00pm02:00pm	02:00pm—4:30pm	
Theme 1:Molecules, bacteria & Cell Injury							
Monday 23-01-2023	**Patho** Introduction to subject Dr. Mohtasim Billah LGF	**Pharma** Introduction to subject Dr. S.M Jadoon LGF	**Prime** Professional identity formation Dr. Mehreen	**Hospital Work**	**Prayer Break**	**Pharma:P1, Batch A1, A2, A3** Dr. Waqas, Dr. Fazli Rabbi, Dr. Tauseef **Patho:P1, Batch B1, B2, B3** Dr. Jawad, Dr. Zainab, Dr. Aisha	
Tuesday 24-01-2023	**Patho** Introduction to cell Dr. Mashal LGF	**Pharma** Nomenclature + Sources + Active principles of Drugs Dr. S.M Jadoon LGF	**F. Medicine** Introduction to F. Medicine + Pillars of F. Med Dr. Abdullah			**Pharma:P1Batch B1, B2, B3** Dr. Waqas, Dr. Tauseef, Dr. Fazli Rabbi **Patho:P1Batch A1, A2, A3** Dr. Jawad, Dr. Mashal, Dr. Zainab	
Wednesday 25-01-2023	**Research** Health System research Dr. Naeem LGF	**Patho** Classification of Bacteria Dr. Khalida LGF	**Pharma** Routes of Drugs administration Dr. Somia LGF			**Pharma:SGD1, Batch A1, A2, A3** Dr. Tauseef, Dr. Waqas, Dr. Fazli Rabbi **Patho:P2, Batch B1, B2, B3** Dr. Aisha, Dr. Zainab, Dr. Mashal	
Thursday 26-01-2023	**ENT** Introduction to ENT Dr. M. Said LGF	**Pathology** Structure of bacterial Cell Dr. Aisha + Dr. zainab SGD				**Pharma:SGD1 Batch B1, B2, B3** Dr. Tauseef, Dr. Waqas, Dr. Fazli Rabbi **Patho:P2 Batch A1, A2, A3** Dr. Aisha, Dr. Zainab, Dr. Mashal	
Friday 27-01-2023	**Ophthalmology** Introduction to subject Dr. Bilal	**Pharma** Absorption of Drugs Dr. Halima LGF	**Patho** Bacterial growth curves Dr. Khalida LGF	**11:00am—12:00pm** **Pharma SDL** Dr. Somia Afzal		**12:00—02:00pm** **Friday Prayers**	**02:00pm—4:30pm** **SDL**

Abbreviations:

Patho P1: Bio Safety Procedures…… Venue: Patho Lab: 02 **LGF Venue:** 3rd Year Lecture Hall **Patho P2:** Gram staining…… venue: Patho Lab: 02

Pharma P01: Lab protocols, apparatus in pharmacy….. Venue: Pharma Lab **Pharma SGD 01:** Sources of Drugs… Venue: Pharma Lab

MEDICAL TEACHING INSTITUTION
BACHA KHAN MEDICAL COLLEGE MARDAN

Time Table for 3rd Year MBBS Student (Session 2023—2024)

Foundation II Module **Week 2**

Day/Date	08:00—09:00am	09:00—10:00am	10:00—11:00am	11:00am—01:00pm	01:00pm—02:00pm	02:00pm—4:30pm	
Theme : Molecules, bacteria & Cell Injury							
Monday 30-01-2023	**Pathology** Normal Flora Dr. Sadia LGF	**Pharma** Bioavailability+bioequailence +hepatic first pass effect+interohepatic circulation Dr. Halima LGF	**F. Medicine** Medical ethics Dr. Zaheer LGF	**Hospital Work**	**Prayer Break**	**Pharma:SGD2, Batch A1, A2, A3** Dr. Fazl e Rabbi, Dr. Tauseef, Dr. Waqas **Patho:P3, Batch B1, B2, B3** Dr. Jawad, Dr. Zainab, Dr. Aisha	
Tuesday 31-01-2023	**Ophthalmology** Refractory errors Dr. Bilal LGF	**Pharma** Distribution of Drugs+volume of distribution Dr. Halima LGF	**Patho** Bacterial Genetics Dr. Zainab LGF			**Pharma:SGD2, Batch B1, B2, B3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:P3, Batch A1, A2, A3** Dr. Jawad, Dr.Zainab, Dr. Aisha	
Wednesday 01-02-2023	**Pharma** Physiological barriers to transport of drugs Dr. Halima LGF	**Patho** Conjugation, Transduction & transformation Dr. Mashal LGF	**Pharma** Biotranformation of Drugs Dr. Fazli Rabbi LGF			**Pharma:P2, Batch A1, A2, A3** Dr. Waqas, Dr. Fazl e Rabbi, Dr. Tauseef **Patho:P4, Batch B1, B2, B3** Dr. Mashal, Dr. Aisha, Dr. Jawad	
Thursday 02-02-2023	**Ophthalmology** Astigmatism + Presbiopia + Aphakia Dr. Hamza LGF	**Pharma** Genetic influence on biotransformation of drugs Dr. Somia LGF	**F. Medicine** Terminology+Medicolegal system in world Dr. Khalid Khan LGF			**Pharma:P2, Batch B1, B2, B3** Dr. Waqas, Dr. Fazl e Rabbi, Dr. Tauseef **Patho:P4, Batch A1, A2, A3** Dr. Mashal, Dr. Zainab, Dr. Jawad	
Friday 03-02-2023	**F. Medicine** Types of Law+court procedures Dr. Shahid LGF	**Pharma** Enzyme induction & inhibition Dr. Halima LGF	**Patho** Lab Diagnosis of Bacterial infection Dr. Zahir Shah LGF	**11:00am—1:00pm** **Hospital Work**		**1:00—02:00pm Friday Prayers**	**02:00pm—4:30pm** **SDL**

Abbreviations:

Patho P3: ZN staining…….. Venue: Patho Lab 02 **Patho P4:** Bacterial Motility……. Venue; Patho Lab 02 **Pharma P02:** Metrology and Medical Abbreviation…… Venue: Pharma Lab **Pharma SGD 02:** Merits & Demerits of various routs of drugs administration…… Venue: Pharma Lab

MEDICAL TEACHING INSTITUTION
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Time Table for 3rd Year MBBS Student (Session 2023-2024)

Foundation II Module **Week 3**

Day/Date	08:00—09:00am	09:00—10:00am	10:00—11:00am	11:00am—01:00pm	01:00pm—02:00pm	02:00pm—4:30pm	
Theme :Molecules, Bacteria & Cell injury							
Monday 06-02-2023	**Pharma** Excretion of Drugs & clearance Dr. Halima LGF	**Patho** Colonization, Invasion, Exotoxin, Endotoxin & their mode of action Dr. Komal + Dr. Zarmina SGD		**Hospital Work**	**Prayer Break**	**Pharma:SGD3, Batch A1, A2, A3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:P5, Batch B1, B2, B3** Dr. Zainab + Dr. Aisha + Dr. Jawad	
Tuesday 07-02-2023	**Patho** Bacterial Pathogenisis Dr. Khalida LGF	**Pharma** Maintenance dose, loading dose+plasma half life Dr. Halima LGF	**F. Medicine** Evidence+recording of evidence Dr. Abdullah LGF			**Pharma:SGD3,Batch B1, B2, B3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:P5,Batch A1, A2, A3** Dr. Zainab + Dr. Aisha + Dr. Jawad	
Wednesday 08-02-2023	**Pharma** Steady state conc of drugs + half life Dr. Halima LGF	**Patho** Stages of typical infection + immunization & vaccination Dr. Zahir Shah LGF	**F. Medicine** Laws related to Medical Jurisprudence Dr. Zaheer LGF			**Pharma:P03, Batch A1, A2, A3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:SGD1, Batch B1, B2, B3** Dr. Zainab + Dr. Aisha + Dr. Jawad	
Thursday 09-02-2023	**Pharma** Bio assay & standardization Dr. S.M jadoon LGF	**Ophthalmology** Watery Eye Dr. Hamza LGF	**Pharma** Pharmacodynamics Dr. S.M Jadoon LGF			**Pharma:P 03, Batch B1, B2, B3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:SGD1, Batch A1, A2, A3** Dr. Zainab + Dr. Aisha + Dr. Jawad	
Friday 10-02-2023	**F. Medicne** Professional misconduct & privileged communication Dr. Abdullah LGF	**Pharma** Molecular Mechanism of Receptors Dr. S.M Jadoon LGF	**Pharma** Drug Antagonism Dr. S.M Jadoon LGF	**11:00am—1:00pm** **Hospital Work**		**1:00—02:00pm** **Friday Prayers**	**02:00pm—4:30pm** **SDL**

Abbreviations:

Patho P5: Hyperplasia (BPH)……. Venue; Patho Lab 02

Pharma P03: Dosage forms of Drugs…… Venue: Pharma Lab

Patho SGD1: Tissue Processing…… Venue: Patho Lab 02

Pharma SGD 03: Tolerance & Tachyphylaxis ….. Venue: Pharma Lab

MEDICAL TEACHING INSTITUTION
BACHA KHAN MEDICAL COLLEGE MARDAN

Time Table for 3rd Year MBBS Student (Session 2023—2024)

Foundation II Module **Week 4**

Day/Date	08:00—09:00am	09:00—10:00am	10:00—11:00am	11:00am—01:00pm	01:00pm—02:00pm	02:00pm—4:30pm
Theme : Aging & Death						
Monday 13-02-2023	**Ophthalmology** Naso Lacrimal duct obstruction Dr. Bilal LGF	**Pharma** Dose response curve+ receptors regulations Dr. S.M Jadoon LGF	**F. Medicine** Death & its Phases. Dr. Shahid LGF	**Hospital Work**	**Prayer Break**	**Pharma:P 4, Batch A1, A2, A3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:P6, Batch B1, B2, B3** Dr: Jawad + Dr. Aisha + Dr. Zainab
Tuesday 14-02-2023	**F. Medicine** Mechanism of Death Dr. Shahid LGF	**Ophthalmology** Dacryocystitis Dr. Bilal LGF	**F. Medicine** Diagnosis + cause of death Dr. Zaheer LGF			**Pharma:P 4, Batch B1, B2, B3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:P6, Batch A1, A2, A3** Dr: Jawad + Dr. Aisha + Dr. Zainab
Wednesday 15-02-2023	**F. Medicine** Death Certificate + Death body disposal Dr. Zaheer LGF	**Pathology** Cell Injury & types Dr. Mohtasim Billah LGF	**Research** Research Protocols Dr. Iftikhar LGF			**Pharma:DSL01, Batch A1, A2, A3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:SGD,2 Batch B1, B2, B3** Dr. Zahir Shah + Dr. Aisha + Dr. Zainab
Thursday 16-02-2023	**F. Medicine** Early postmortem Changes Dr. Abdullah LGF	**Pathology** Reversible & irreversible Cell Injury Dr. Nazish LGF	**F. Medicine** Late Postmortem Changes Dr. Khalid LGF			**Pharma:DSL 01, Batch B1, B2, B3** Dr. Fazl eRabbi, Dr. Tauseef, Dr. Waqas **Patho:SGD,2 Batch A1, A2, A3** Dr. Zahir Shah + Dr. Zainab + Dr. Jawad
Friday 17-02-2023	**Ophthalmology** Cataract Dr. Hamza	**PRIME** Professionalism Dr. Muslim	**Patho** Cellular Adoptation Dr. Zarmina LGF	**11:00am—1:00pm** **Hospital Work**		**1:00—02:00pm** **Friday Prayers** **02:00pm—4:30pm** **SDL**

Abbreviations:

Patho P 6: Testicular Atrophy…… Venue: Patho Lab 02

Patho SGD 2: Immunity + bacterial vaccines…. Venue: Patho Lab 02 **Pharma P04:** Demonstration of Intramuscular & Intravenous injections on a dummy…… Venue: Pharma Lab **Pharma DSL 01**: Clinical Trials…… Venue: Pharma Lab

MEDICAL TEACHING INSTITUTION
BACHA KHAN MEDICAL COLLEGE MARDAN
Time Table for 3rd Year MBBS Student (Session 2023—2024)

Foundation II Module **Week 5**

Day/Date	08:00—09:00am	09:00—10:00am	10:00—11:00am	11:00am—01:00pm	01:00pm—02:00pm	02:00pm—4:30pm
Theme : Aging & Death						
Monday 20-02-2023	**Patho** Pathological Calcification Dr. Jawad LGF	**Pharma** Drug interaction Dr. Halima LGF	**Pathology** Apoptosis Dr. Nazish LGF	**Hospital Work**	**Prayer Break**	**Pharma: P 05, Batch A1 + A2 + A3** Dr. Tauseef, Dr. Fali Rabbi, Dr. Waqas **Patho:P7, Batch B1+B2+B3** Dr: Jawad + Dr. Zainab + Dr. Ayesh
Tuesday 21-02-2023	**Patho** Necrosis Dr. Zahir Shah LGF	**C. Medicine** Introduction to c. Medicine + Concept of disease Dr. Huma LGF	**Pharma** Adverse Drug reactions Dr. Halima LGF			**Pharma: P 05, Batch B1+B2+B3** Dr. Tauseef, Dr. Fali Rabbi, Dr. Waqas **Patho:P7, Batch A1 + A2 + A3** **Dr: Jawad + Dr. Zainab + Dr. Ayesha**
Wednesday 22-02-2023	**F. Medicine** Death Certificate Dr. Abdullah LGF	**PRIME** Orientation to Clinical rotation **Dr. Imtiaz Ud Din**	**C. Medicine** Healthn Determinants, Dimention and indicators + SDGs **Dr. Huma LGF**			**Forensic:SGD01, Batch A1+A2+A3** Dr. Abdullah+Dr. zaheer+Dr. Shahid Iqbal **Patho: P8, Batch B1+B2+B3** Dr.Mashal + Dr. Zainab + Dr. Ayesha
Thursday 23-02-2023	**Pharma** New Drug developments Dr. Halima Saadia LGF	**Pathology** Steatosis Dr. Komal LGF	**Community Medicine** Primary Health Care Dr. Huma LGF			**Forensic:SGD01, Batch B1+B2+B3** Dr. Abdullah+Dr. zaheer+Dr. Shahid Iqbal **Patho: P8, Batch A1 + A2 + A3** Dr. Mashal + Dr. Zainab + Dr. Ayesha
Friday 24-02-2023	**PRIME** Patient safety **Dr. Imtiaz ud Din** LGF	**Pharma** Therapeutic Index + Therapeutic Window Dr. S.M Jadoon LGF	**Research** Process of Health research Dr. Naeem LGF	**11:00 am to 01:00 pm** **Hospital Work**		**1:00—02:00pm** **Friday Prayers** / **2:00pm-4:30pm** **SDL**

Abbreviations: Patho P7: Pathological calcification……. Venue: Patho Lab 02 **Patho P08:** Necrosis…….. Venue: Patho Lab 02 **F. Medicine SGD01:** Death certificate, Legal Procedure, Recording of evidence, consent **F. Med SGD-1:** Death Certificate, Legal Procedure, Recording of evidence, consent For

Contact Hours Foundation II Module.

3rd Professional MBBS, 2023													
			1st Week		2nd Week		3rd Week		4th Week		5th Week		
	S.No	Subjects	LGF	P/SGD	LGF	P/SGD	LGF	P/SGD	LGF	P/SGD	LGF	P/SGD	Total Hours
Foundation II	1	ENT	1										1
	2	Ophthalmology	1		2		1		3				7
	3	Pathology	6	8	4	8	4	8	3	8	4	8	61
	4	Pharma	4	8	6	8	7	8	1	8	4	4	58
	5	C. Medicine									3		3
	6	F. Medicine	1		3		3		6		1	4	18
	7	Research	1						1		1		3
	8	Prime	1						1		2		4
	9	SDL	2		2		2		2		2		10
	TOTAL												165

LEARNING METHODOLOGIES:

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

- Lectures (Large group format)
- Small group discussions
- Lab practical.
- Case based learning
- Tutorials

LEARNING SITES

- Lectures Halls
- Practical Lab
- Hospital Wards
- Hospital OPD
- Library
- SLRC

LEARNING RESOURCES

RECOMMENDED BOOKS

Pharmacology

1. Basic and Clinical Pharmacology by Katzung, 10th Ed., McGraw-Hill.
2. Pharmacology by Champe and Harvey, 2nd Ed., Lippincott Williams &Wilkins.

Pathology

1. Pathological Basis of Disease by Kumar, Cortan and Robbins, 7thEd., W.B. Saunders.
2. Medical Microbiology and Immunology by Levinson and Jawetz,9th Ed., McGraw-Hill.
3. Medical Genetics by Jorde, 3rd Ed., Mosby.
4. Clinical Pathology Interpretations by A. H. Nagi
5. Review of Medical Microbiology by Jawetz

Forensic Medicine

1. Simpson's Forensic Medicine by Barnard Knight, 11th Ed.Edward Arnold,London.
2. Parikh's Text book of Medical Jurisprudence, Forensic Medicine andToxicology by C.K. Parikh 6th Ed., CBS Publisher.
3. Buchanan"s Text book of Forensic Medicine and Toxicology byBuchanan, 9th ed., Livingstone.
4. G. Principles and Practice of Forensic Medicine by Prof. Nasib R. Awan.
5. Medical Jurisprudence and Toxicology by Dr. SiddiqueHussain.
6. Textbook of Forensic Medicine & Toxicology KrishanVij (4th Edition)

Research and biostatistics

1: Park's text book of preventive and social medicine
2: A synopsis of epidemiology and basic statistics (Ali Muhammad Mir)
3: Statistics at square one (TDVS winscow)
4: Essentials of research design and methodology. (GeoferryMarczyk)
5. Text book by Illyas Ansari.
6. The essentials of clinical epidemiology (Robert H)

MEDICINE

1. Kumar and Clark for Medicine 8th edition 2012
2. Davidson

ASSESSMENT BLUE PRINT

Introduction

The year-3 will be assessed in 3 blocks

1) Block-G (Foundation 2 and Infection and Inflammation modules) will be assessed in paper-G

2) Block-H (Multisystem, blood and MSK modules) will be assessed in paper-H

3) Block-I (CVS and Respiratory module) will be assessed in paper-I

4) Each written paper consists of 120 MCQs and

5) Internal assessment will be added to final marks in KMU as shown in table below.

6) In OSPE, each station will be allotted 6 marks, and a total of 120 (plus 10% marks of internal assessment) marks are allocated for each OSPE/OSCE examination Practical assessment will be in the form of OSPE/OSCE which will also include embedded viva stations. The details of each section are given in the tables given below.

Paper-G (Foundation 2 and Infection &Inflammation)

Table-1: MCQs

Subject	Foundation 2 module	Infection and Inflammation module	Total MCQs
Pharmacology	22	20	42
Pathology	15	23	38
Forensic medicine	7	08	15
Community medicine	3	05	08
ENT	1	03	04
Eye	3	02	05
PRIME including Research	1+2(3)	0	03
Medicine	0	01	01
Surgery	0	02	02
Gynecology	0	01	01
Pediatrics	0	01	01
Total	**54**	**66**	**120**

Table-2: OSPE/OSCE

Subject	Foundation 2 module	Viva stations	Infection and Inflammation module	Viva stations	Total OSPE/OSCE stations (for final exam*)
Pharmacology	6	1	01	1	2
Pathology	9	1	13	1	6
Forensic medicine	4	1	03	1	2
Community medicine		1	1		2
Medicine	OSCE station for history and physical examination				1
Surgery	OSCE station for history and physical examination				1
Total	**19**	**3**	**17**	**3**	**12+8 (viva) = 20**

*out of total of 36 OSPE/OSCE stations, 12 will be allocated for final exam, plus 6 vivastations and 2 OSCE stations. A minimum of 20 stations will be used in final exams.Total marks will be 120 (6 marks for each station).