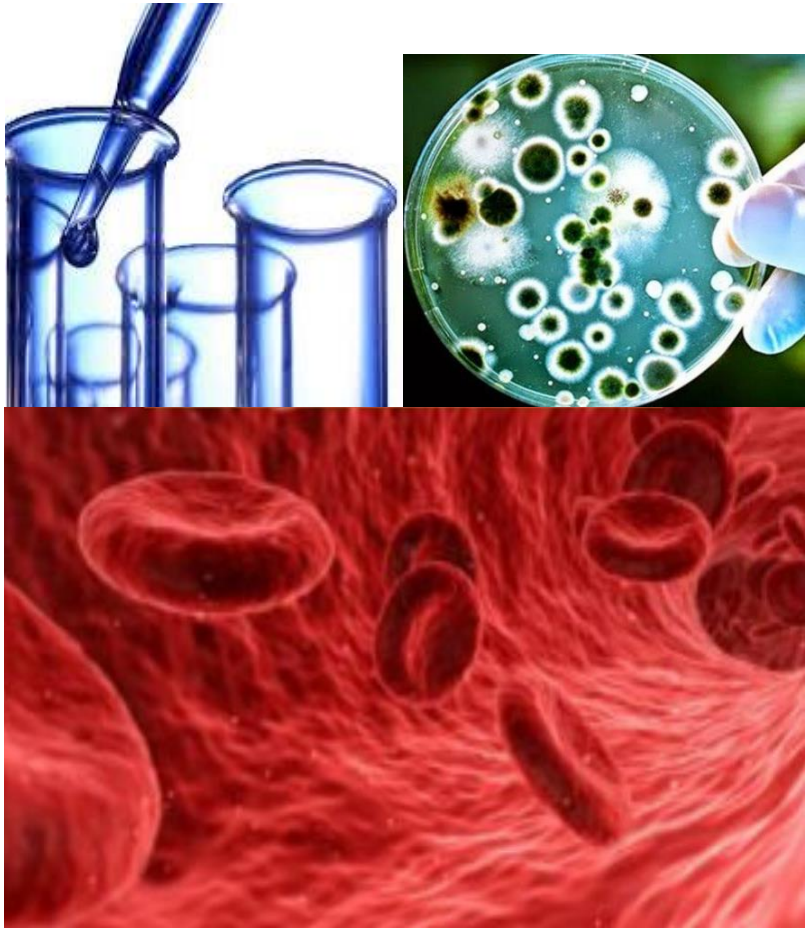

INFECTION AND INFLAMMATION MODULE
3RD YEAR
STUDY GUIDE

3RD YEAR MBBS

Contents

Vision and Mission of KGMC

Khyber Medical University: Vision

Khyber Medical University will be the global leader in health sciences academics and research for efficient and compassionate health care.

Khyber Girls Medical College: Vision

"Excellence in health care, research, teaching and training in the service of Humanity"

Khyber Girls Medical College: Mission

The mission of KGMC is to promote compassionate and professional health care leaders
Who are knowledgeable, skillful, and community oriented lifelong learners serving humanity through evidence based practices.

Curriculum Committee KGMC

Chair:

Professor Dr.Zahid Aman, Dean KGMC.

Co-Chair:

Professor Dr Amin ul HAQ, Associate Dean KGMC.

Clinical Sciences:

- Dr. Mohammad Noor Wazir ,Department of Medicine KGMCHMC
- Dr. Bushra Rauf Department of Gynae KGMCHMC.
- Dr. Sofia Iqbal, Department of Ophthalmology KGMCHMC.
- Dr. Said Amin Department of Medicine KGMCHMC.
- Dr. Ghareeb Nawaz Department of ENT KGMCHMC.
- Dr. Jamshed Alam Department of Surgery KGMCHMC.
- Dr. Ambreen Ahmad, Department of Pediatrics KGMCHMC.
- Dr. Ain-ul-Hadi Department of Surgery KGMCHMC.
- Dr. Fawad Rahim Department of Medicine KGMCHMC.

Behavioral Sciences:

- Dr. Ameer Abbas Department of Psychiatry KGMCHMC.

Medical Education

- Dr. Naheed Mahsood, Department of Medical Education, KGMC.
- Dr. Naveed Afzal Khan, Department of Medical Education, KGMC.
- Dr. Khurram Naushad , Department of Medical Education, KGMC

Basic Sciences:

- Dr. Amin-ul-Haq Department of Biochemistry, KGMC.
- Dr. Khalid Javed Department of Pathology, KGMC.
- Dr. Raheela Amin Department of Community Medicine, KGMC.
- Dr. Zubia Shah Department of Physiology, KGMC.
- Dr. Naheed Siddique Department of Forensic Medicine, KGMC.
- Dr. Shams Suleman Department of Pharmacology, KGMC.
- Dr. Shahab-ud-Din, Department of Anatomy, KGMC.

Infectious Diseases

- Prof. Dr. Bushra Rauf Department of Gynae…….Member
- Prof. Dr. Samia Tabassum Department of Gynae…….Member
- Dr. Saeed-ur-Rehman Professor Department of Pathology…… Member
- Dr. Shams Suleman Associate Professor Department of Pharmacology…….Member
- Dr. Ayesha Jamil Associate Professor Department of Pharmacology…….Member
- Dr. Anwar-ul-Haq Associate Professor Department of Forensic Medicine…….Member
- Dr. Fawad Rahim Assistant Professor Department of Medicine…….Member
- Dr. Amjad Assistant Professor Department of Surgery B…….Member
- Dr. Ghazala Zarin Afridi Lecturer Department of Pathology…… Member
- Dr. Noreen Shah Senior Lecturer Department of Community…… Member

Integrated curriculum:

An integrated curriculum is all about making connections, whether to real life or across the disciplines, about skills or about knowledge. An integrated curriculum fuses subject areas, experiences, and real-life knowledge together to make a more fulfilling and tangible learning environment for students. Integrated teaching means that subjects are presented as a meaningful whole. Students will be able to have better understanding of basic sciences when they repeatedly learn in relation to clinical examples. Case based discussions, computer-based assignments, early exposure to clinics, wards, and skills acquisition in skills lab are characteristics of integrated teaching program.

Outcomes of the curriculum:

The Curricular Outcomes of the MBBS Program for a Graduating Doctor according to the PMDC are as follows:

1. **Knowledgeable**

Knowledgeable about the diseases and health conditions prevalent in the population of Pakistan and use Evidence-based medicine to provide best possible cost-effective care.

2. **Skillful**

Skillful in History taking and Physical examination to compassionately deal with a patient.

3. **Community health promoter**

Take appropriate decisions and actions for protecting and promoting the health of their community.

4. Critical Thinker

Evaluate critically the patient data to effectively deal with complexity of medical decisions for the best possible outcomes using evidence-based practices in service of humanity.

5. Professional

Display professional values (honesty, accountability, cultural and religious sensitivity), attitudes and behaviors (empathy, ethics, good communication skills and lifelong learner) that embody good medical practice.

6. Researcher

Exhibit a spirit of inquisitiveness, inventiveness, and ethical conduct while carrying out research in accordance with the prescribed guidelines.

7. Leader and role Model

Demonstrate exemplary conduct and leadership in Advancing healthcare, enhancing medical education, and Enhancing the trust of the public in the medical profession by being exceptional role models.

KNOWLEDGE

By the end of five year MBBS program the KGMC student should be able to;

1. Acquire a high level of clinical proficiency in history taking, physical examination, differential diagnosis, and the effective use of medicine's evolving diagnostic and procedural capabilities including therapeutic and palliative modalities
2. Manage the common prevalent diseases in community
3. Identify the common medical emergencies
4. Develop plan for prevention of common community diseases
5. Formulate a referral plan
6. Compose a prescription plan

PSYCHOMOTOR

By the end of five year MBBS program the KGMC student should be able to;

1. Demonstrate the ability to perform the disease specific relevant examination
2. Respond to common medical emergencies
3. Master the skill of first aid
4. Perform BLS
5. Apply the best evidenced practices for local health problems

AFFECTIVE

By the end of five year MBBS program the KGMC student should be able to

1. Relate to patient and careers vulnerability
2. Demonstrate ethical self-management
3. Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making.
4. Display compassion with patient and colleagues
5. Demonstrate in clinical care an understanding of the impact of psychological, social, and economic factors on human health and disease

Teaching Hours Allocation

Table 1: Hours Allocation

S. No	Subjects	Hours
1	Pharmacology	35
2	Pathology	46
3	Forensic medicine	12
4	Community medicine	15
5	Family medicine	2
6	Medicine	1
7	Surgery	3
8	Pediatrics	2
9	Gynaecology	2
10	ENT	5
11	EYE	3
12	PRIME	2
13	Research	5
	Total hours	133

Learning Objectives

At the end of this module, the 3rd year students would be able to:

1. Describe the process of acute & chronic inflammation with their outcomes
2. Relate different aspects of healing and repair
3. Differentiate common pathogenic bacteria based on morphology, pathogenesis & lab diagnosis.
4. Relate bacterial pathogenic factors to clinical manifestations of common infectious diseases.
5. Describe the pharmacological details of anti-inflammatory drugs
6. Apply/relate the pharmacokinetics & pharmacodynamics of chemotherapeutic agents to their use in infectious diseases
7. Construct / Write prescriptions for various inflammatory and infectious diseases
8. Describe medico legal aspects of HIV patient.
9. Describe mechanism of wound causation.
10. Describe medico legal aspects of parameters used for personal identification in real life situation
11. Apply parameters of a person's identification in a simulated environment
12. Describe the epidemiology of common infectious diseases.
13. Explain the preventive and control measures for infectious diseases.
14. Explain the control & preventive measures for nosocomial infections.
15. Describe the risks associated with hospital waste and its management.

Theme-1 (Pain and Fatigue)			
Subject	**Topic**	**Hours**	**Learning objectives**
Pharmacology	Overview to anti-inflammatory drugs	1	-Classify anti-inflammatory drugs -Describe the role of DMARDs and glucocorticoids as anti-inflammatory agents
	NSAIDs (Non-selective cox inhibitors: Aspirin & other commonly used NSAIDs)		-Classify NSAIDS -Differentiate between non-selective COXinhibitors and selective COX-2 inhibitors based on
			mechanism of action.
			-Name the prototype non-selective COX inhibitor.
			-Describe the pharmacokinetics of Aspirin
			-Describe the mechanism of action of aspirin as
			anti-platelet, analgesic, antipyretic and anti-
			inflammatory agent.
			-Give the dose of Aspirin as anti-platelet,
			analgesic/antipyretic and as anti-inflammatory
			drug.
			-Describe clinical uses of NSAIDs.
			-Describe the adverse effects of NSAIDs. -Describe the drug treatment of Aspirin poisoning

			-Describe the pharmacokinetics with emphasis on
			dosage, duration of action and elimination of
			Diclofenac, Ibuprofen, Indomethacin, Mefanamic
			acid and Piroxicam in contrast to Aspirin
			-Relate pharmacokinetics and pharmacodynamics of NSAIDs to their clinical applications
	Selective COX-2 inhibitors	1	-Describe the mechanism of action of selective
			COX-2 inhibitors.
			-Describe the clinical uses of selective COX-2
			inhibitors
			-Describe the adverse effects of selective COX-2
			inhibitors
			-Describe the merits and demerits of selective COX-2 inhibitors and non-selective COXinhibitors.
	Paracetamol (Acetaminophen)		-Describe the pharmacokinetics of Paracetamol -Describe the mechanism of action of Paracetamol. -Describe the clinical uses of Paracetamol. -Describe the adverse effects of Paracetamol. -Give therapeutic and fatal doses of Paracetamol. -Describe the drug treatment of Paracetamolpoisoning

Pathology	Cells of Inflammation	1	-Describe different cells of inflammation -Describe the functions of various cells ofinflammation - Enumerate different causes of leukopenia and leucocytosis(each neutrophil, lymphocyte, monocyte, eosinophil, basophil seperately)
	Overview to Acute Inflammation and vascular phase	1	-Define acute inflammation -Describe causes of acute inflammation -Describe the vascular events of acuteinflammation
	Recognition ofmicrobes	1	-Describe various molecular patterns and appropriate receptors used by the inflammatorycells to identify microbes -Relate the recognition of microbes to the initiation of inflammation
	Cellular phase of acute inflammation	1	-Describe the sequence of events and cellular changes involved in cellular phase of acuteinflammation
	Plasma DerivedMediators	1	-Enumerate plasma derived mediators -Enlist the functions of each mediator -Describe the different cascades involved in thegeneration of mediators
	Cell Derived Mediators		-Enumerate cell derived mediators -Enlist the functions of each mediator

Theme (Pain and Fatigue)			
Subjects	**Topics**	**Hours**	**Los**
Pharmacology	Anti-histamines	1	-Classify anti-histamines -Differentiate between first and second generationanti-histamines -Describe the pharmacologic effects of H1-receptor antagonists. -Describe the clinical uses of H1-receptorantagonists. -Enlist the adverse effects of H1-receptorantagonists. -Describe the drug interactions of H1-receptorantagonists.
	Serotonin agonistand antagonist	1	- Enlist serotonin agonists - Classify serotonin antagonists - Describe the mechanism of action of serotonin - Describe the organ system effects of serotonin. - Describe the clinical uses of serotonin agonistsand antagonists - Describe the pharmacological basis ofondansetron in chemotherapy induced vomiting

Pathology	Morphological patterns, outcomes, defects of inflammation	1	-Enumerate the different morphological patternsof inflammation -Describe the histological changes in each pattern - Enlist the outcomes of inflammation -Enumerate the various defects of inflammation -Describe the consequences of the defects ofinflammation
	Overview to chronic inflammation	1	-Define chronic inflammation -Differentiate chronic from acute inflammation -Describe the causes and morphological featuresof chronic inflammation
	Granulomatous inflammation	1	Define granulomatous inflammation -Describe the morphological features and mediators involved in granulomatousinflammation
	Cells and mediators of chronic inflammation	1	-Enlist the cells of chronic inflammation -Enumerate the mediators of chronicinflammation -Describe the function of the mediators -Relate the functions of mediators to themorphological changes seen in chronic inflammation
	Systemic effects of inflammation	1	-Enumerate the systemic effects of inflammation -Describe the pathophysiology of the systemiceffects of inflammation

Forensic Medicine	Antidotes	1	Define and classify antidotes Describe the mechanism of action of different antidotes
	Steps of management in a case of poisoning	1	Describe general steps of management in a case of poisoning
Community Medicine	Infectious disease epidemiology	1	• Define incubation period • Explain the principles of disease eradication and control • Define serial intervals • Define infectivity period
	Infection control	2	• Define the basic definition related to infectious disease epidemiology • Review the role of susceptible host for successful parasitism, modes of transmission and the host defense system • List and explain the various classifications of communicable diseases with special reference to the scope and purpose of the International classification of Disease (ICD -10). • Enlist the common infectious diseases affecting the population of Pakistan as per National institute of Health Pakistan. • Explain the effect of climate change and seasonal variation on specific diseases globally and in Pakistan. • Explain the role of personal hygiene & PPE in infection control.

	• Disease careers • Reservoirs of infection • Disinfection • Communicable disease control measure (aimed at agent, host, others, administrative measures and vector control measures	1	• Define disease careers • Explain the reservoirs of infection • Differentiate between sterilization and disinfection • Explain the types and procedures of disinfection • Discuss Communicable disease control measure (aimed at agent, host, others, administrative measures and vector control measures

Theme (Trauma and repair)			
Subjects	**Topics**	**Hours**	**LOs**
Pathology	Prostaglandins	1	- Enlist various prostaglandins- - Describe the mechanism of action ofProstaglandins. - Describe the organ system effects ofProstaglandins. - Describe the clinical uses of Prostaglandins.
	Overview to tissuehealing and repair	1	-Differentiate between regeneration and repair -Describe various steps involved in the process oftissue healing and repair
	Tissue regeneration		-Define regeneration -Enlist organs capable of regeneration -Describe the process and mediators involved in regeneration
	Cell Cycle and itsrole in repair		-Define cell cycle -Describe the initiation, various phases andproteins involved in the cell cycle -Discuss cells capable of entering the cell cycle -Describe proliferative capabilities of various cells

	Repair by scarring	1	-Describe the various steps involved in process ofrepair by scarring -Describe the various mediators involved in thesteps of scarring
	Growth factors and receptors	1	-enumerate various growth factors and theirreceptors -Describe the most common pathways by whichgrowth factors affect tissue repair and regeneration
	ECM		-Classify various components of ECM -Describe the role and importance of ECM in tissue repair
	Factors affecting wound healing/abnormalscarring	1	-Enlist the various factors that influence woundhealing -Describe the mechanism by which these factorsaffect wound healing -Describe the abnormalities of repair and their consequences
Forensic Medicine	Overview to medico-legal aspects of trauma (Wound causation)	1	Describe mechanism of wound causation
	Toxicity by analgesics	1	Describe the medico legal aspects of toxicity byaspirin and paracetamol

Community Medicine	Nosocomial infection & its control	1	• Describe the prevalence of the nosocomial infections globally and Specifically in Pakistan. • Identify the cause of nosocomial infections in Pakistan. • Enlist common nosocomial infections. • Describe the importance of different modes of transmission for causation of the nosocomial infections. • Explain the control & preventive measures for nosocomial infections

Theme (Fever and Infection)			
Subjects	**Topics**	**Hours**	**Los**
Pharmacology	Introduction to Chemotherapy	2	1. Define basic terms like chemotherapy, antibiotic, antimicrobial, MIC, MBC, chemoprophylaxis, empirical therapy and post-antibiotic effect, bacteriostatic and bactericidal antimicrobials. 2. Explain advantages of drug combinations. 3. Describe various mechanisms of bacterial resistance against antibiotics. 4. Differentiate between concentration and time dependent killing with examples. 5. Classify antimicrobials on the basis of mechanism of action (MOA)
	Penicillins	2	1. Classify beta-lactam antibiotics 2. Enlist narrow and broad spectrum Penicillins. 3. Enlist anti-pseudomonal, anti- staphylococcal/ beta lactamase resistant Penicillin. 4. Enlist long- and short-acting Penicillins 5. Describe anti-bacterial spectrum of Penicillins. 6. Describe pharmacokinetics in respect of emphasis on route of administration and excretion of Penicillins
			7. Describe mechanism of action of Penicillins 8. Describe clinical uses of Penecillins 9. Describe adverse effects of Penicillins,

			10. Describe contraindications of Penicillins. 11. Describe principal mechanism of bacterialresistance to Penicillins 12. Describe drug interactions of Penicillins 13. Apply formula for interconversion of milligrams and units of Penicillin G. 14. Relate pharmacokinetics and pharmacodynamics of Penicillin with their clinical applications / uses.
	Cephalosporins	1	1. Classify Cephalosporins 2. Describe anti-bacterial spectrum ofCephalosporins. 3. Describe pharmacokinetics of Cephalosporins with special emphasis onroute of administration and excretion. 4. Describe clinical uses of Cephalosporins 5. Describe the adverse effects ofCephalosporins. 6. Describe drug interactions of Cephalosporins with Ethanol. 7. Describe the principal bacterialmechanism of resistance to Cephalosporins. 8. Relate pharmacokinetics and pharmacodynamics of Cephalosporin withtheir clinical applications / uses.
	Beta lactamaseinhibitors	1	1. Enlist beta-lactamase inhibitors 2. Explain the rationale for using beta lactamase inhibitors in combination withß-lactam antibiotics.

	Monobactams &Carbapanem,	1	1. Describe the antibacterial spectrum of Monobactams and Carbapanem 2. Describe the clinical uses of Monobactams and Carbapanem
	Vancomycin	1	1. Describe the MOA of Vancomycin. 2. Describe clinical uses of Vancomycin 3. Describe the use of vancomycin in MRSA(Methicillin-resistant Staph aureus). 4. Describe adverse effects of Vancomycin 5. Describe “Red man/Red neck” syndrome.
	Fosfomycin Bacitracin & Cycloserine	1	1. Enlist clinical uses of Fosfomycin,Bacitracin & Cycloserine
	Protein synthesisinhibitors:	1	Classify bacterial protein synthesis inhibitors
	Tetracyclines	1	• Classify Tetracyclines. • Describe anti-bacterial spectrum of Tetracyclines. • Describe the pharmacokinetics of Tetracycline with special emphasis onabsorption of Tetracyclines. • Describe mechanism of action ofTetracyclines. • Describe the principal mechanism ofresistance to Tetracyclines. • Describe clinical uses of Tetracyclines. • Describe adverse effects of Tetracyclines • Describe Black Bone disease.

			• Describe the teratogenic effects ofTetracyclines. • Describe drug interactions ofTetracyclines. • Describe the adverse effect related to theuse of outdated (expired) Tetracycline products. • Relate pharmacokinetics and • pharmacodynamics of Tetracycline withtheir clinical applications / uses.
Pathology	Bacteria: Pyrogenic Bacteria	1	-Define boil and furuncle -Enlist organisms responsible for pyrogenicinfections -Describe important properties, pathophysiology, lab diagnosis of GPC &GNC
	Bacteria: Rickettsia	1	-Define Rickettsia -Describe the important properties, pathophysiology, lab diagnosis of diseases caused by Rickettsia
	Spore forming GProds	1	-Enumerate spore forming GP rods - Describe the important properties, pathophysiology, clinical features and labdiagnosis of spore forming GP rods
	Non Spore formingGP rods		Enumerate non spore forming GP rods

			- Describe the important properties, pathophysiology, clinical features and lab diagnosis of non-spore forming GP rods
	Chlamydia	1	Describe the important properties, pathophysiology, clinical features and lab diagnosis of chlamydia.
	Miscellaneous: Sepsis and Septic Shock	1	-Define sepsis and septic shock -Enlist organisms capable of causing sepsis and inducing septic shock -Describe the pathophysiology and clinical features of septic shock
	Zoonotic Infections	1	-Enlist organisms causing zoonotic infections -Describe the important properties, pathophysiology, clinical features and lab diagnosis of different zoonotic diseases
	General outlines of identification	2	Describe methods and parameters of identification
	Fetal age determination		Write important physical developmental stages of fetus for age estimation
	Age determination by skeletal study		Write important skeletal points of age estimation
	Age estimation by dental study		Write important dental points for age estimation
	Ages of medico legal significance		Enlist important ages of legal significance

Theme (Fever and Infection)			
Subjects	**Topics**	**Hours**	**Los**
Pharmacology	Aminoglycosides	1	• Enlist Aminoglycosides. • Describe anti-bacterial spectrum ofAminoglycosides. • Describe the pharmacokinetics of Aminoglycosides with special emphasis on route of administration, concentration- dependent killing and post-antibiotic effect. • Describe mechanism of action ofAminoglycosides. • Describe the principal mechanism ofresistance to Aminoglycosides. • Describe clinical uses of • Aminoglycosides. • Describe adverse effects ofAminoglycosides. • Describe the drug interactions ofAminoglycosides. • Relate pharmacokinetics and pharmacodynamics of Aminoglycosides with their clinicalapplications / uses.

	Macrolides & other related drugs	2	• Enlist Macrolides. • Describe anti-microbial spectrum ofMacrolides • Describe pharmacokinetics of Macrolides • Describe the mechanism of action ofMacrolides • Describe the principal mechanism ofresistance to Macrolides • Describe clinical uses of Macrolides • Describe adverse effects of Macrolides. • Describe drug interactions of Macrolides • Differentiate the salient features of Erythromycin, Clarithromycin and Azithromycin in respect of dosing andclinical use. • Relate pharmacokinetics and pharmacodynamics of Macrolides with their clinical applications / uses.
	Linezolid	1	• Describe mechanism of action ofLinezolid • Describe clinical uses of Linezolid with special emphasis on methicillin-resistant staphylococci and vancomycin-resistant enterococci
	Clindamycin		• Describe mechanism of action ofClindamycin. • Enumerate clinical uses of Clindamycin. • Describe antibiotic-associated(pseudomembranous) colitis.
	Streptogramins		• Enumerate Streptogramins. • Describe clinical use of Quinupristin- • Dalfopristin in VRE (Vancomycin-resistant enterococci).

	Chloramphenicol	1	• Describe anti-microbial spectrum ofChloramphenicol • Describe mechanism of action ofChloramphenicol • Enlist clinical uses of Chloramphenicol • Describe the reason for obsoleting thesystemic use of Chloramphenicol • Enlist adverse effects of Chloramphenicol
	Quinolones	1	• Describe Gray baby syndrome. • Classify Quinolones. • Describe the pharmacokinetics of Fluroquinolones with special emphasis onhalf-life of Moxifloxacin • Enlist respiratory Quinolones. • Describe anti-microbial spectrum ofFluoroquinolones. • Describe mechanism of action ofFluoroquinolones. • Describe the principal mechanism ofresistance to Fluroquinolones, • Describe clinical uses of Fluroquinolones • Describe adverse effects ofFluroquinolones • Describe drug interactions ofFluroquinolones • Relate pharmacokinetics and pharmacodynamics of Fluoroquinolones with their clinical applications / use.

	Sulfonamides and Trimethoprim	2	• Classify Sulfonamides • Describe anti-microbial spectrum ofSulfonamides • Describe mechanism of action ofSulfonamides and Trimethoprim • Describe mechanism of resistance toSulfonamides • Describe clinical uses of Sulfonamidesand Trimethoprim • Describe adverse effects of Sulfonamidesand Trimethoprim • Describe the advantages of combining sulfamethoxazole with trimethoprim (Co-Trimoxazole) • Describe the drug interaction of • Sulphonamides with Phenytoin.
	Parasites: HydatidCyst	1	• Describe the life cycle and important propertiesof Echinococcus • Relate the pathogenesis to the clinical featuresand lab work up of Echinococcus • Identify cysts of Echinococcus in the lab
	Leishmania		• Describe the life cycle, and important propertiesof Leishmania • Relate the pathogenesis to the clinical featuresand lab work up of Leishmania

Pathology	Toxoplasma	2	• Describe the life cycle and important propertiesof Toxoplasma • Relate the pathogenesis to the clinical features and lab work up of Toxoplasma
	Malaria		• Describe the life cycle and important propertiesof Malarial parasite • Relate the pathogenesis to the clinical features and lab work up of Malaria
	Tenia		• Describe the life cycle, important properties, ofTenia saginata and solium • Relate pathogenesis to the clinical features andlab work up of Tenia saginata and solium
Forensic Medicine	Sex determination	2	Describe parameters of sex determination
	Race determination		Describe parameters of race determination
	Examination ofhair		Describe medico legal aspects of hair
	Forensic odontology		Write the application of odontology in forensicmedicine
	Forensic Anthropometry		Describe medico legal aspects of forensicanthropometry

Community Medicine	Epidemiology and control of vector borne diseases • Malaria • Dengue and other Viral haemorrhagic fevers and Arboviral infections • Plague • Filariasis	2	• Describe the epidemiological determinants, frequency and distribution of Malaria • Compare the prevalence/incidence of malaria in different provinces of Pakistan. • Explain the preventive and controlmeasures of Malaria • Describe the scope/function of Malaria control program. • Explain the types, risk factors, complications and control measures of viral hemorrhagic fevers including Dengue fever
	Epidemiology & control of Leishmaniasis	1	• Describe the epidemiological determinants, frequency and distribution of Leishmaniasis • Explain the preventive and controlmeasures of Leishmaniasis
	zoonotic and direct contagious diseases • Rabies • Anthrax • Plague • Brucellosis • Tetanus • Scabies	2	• Explain the pre and post exposure prophylaxis of Rabies • Explain the epidemiology, types of Anthrax and its preventive measures • Discuss the history, types and prevention of Plague • Explain the etiology, risk factors, clinical features and prevention of Brucellosis • Explain the preventive measures of Scabies • Discuss the etiology, risk factors, clinical features and prophylaxis of pre and post exposure of Tetanus

	• Leprosy • Trachoma		• Explain the etiology, risk factors, stages and preventive measures of Leprosy • Explain the etiology, risk factors, complications and preventive measures of Trachoma
Family medicine	Malaria & Hepatitis control program teams	1	• Explain the etiology, clinical features, types, investigations and management of Malaria in family practice
			• Describe the red-flags in a patient with Malaria for referral to specialty care
			• Identify at risk patients of hepatitis and Malaria and offer them screening

Theme (Fever and Infection)			
Subjects	**Topics**	**Hours**	**Los**
Pharmacology	Antimalarials	3	• Describe terms like chemoprophylaxis, causal prophylaxis, terminal prophylaxisand radical cure with examples of drugs. • Classify antimalarial drugs. • Enlist drugs used for chemoprophylaxis ofmalaria.
			• Enlist drugs used for radical cure ofmalaria. • Describe the pharmacokinetics of Chloroquine with special emphasis onvolume of distribution and dosing • Describe mechanism of action of Chloroquine, Quinine, Mefloquine, Halofantrine, Primaquine, Pyrimethamine and Artemisinins. • Describe adverse effects of antimalarialdrugs • Describe Cinchonism and Blackwaterfever. • Enlist the antimalarial drugs relativelysafe in pregnancy. • Describe the antimalarial drugs contraindicated in G6PD deficiency. • Relate pharmacokinetics and pharmacodynamicsof antimalarial drugs with their clinical applications / use.

	Antifungal drugs	2	• Classify Antifungal drugs. • Describe the pharmacokinetics of Amphotericin B and Ketoconazole • Describe the advantages of liposomalpreparation of Amphotericin B • Describe mechanism of action of Azoles, Amphotericin B, Griseofulvin, Turbinafine, and Nystatin. • Describe clinical uses of Azoles, Amphotericin B, Griseofulvin, Turbinafine, and Nystatin. • Describe adverse effects of Azoles, Amphotericin B, Griseofulvin, Turbinafine, and Nystatin. • Describe drug interactions of Ketoconazole and Amphotericin B
	Antivirals	1	• Classify antiviral drugs
	Anti-herpes	1	• Enlist anti- Herpes drugs • Describe the pharmacokinetics ofAcyclovir • Describe mechanism of action ofAcyclovir • Describe clinical uses of Acyclovir. • Describe adverse effects of Acyclovir Describe the role of Ganciclovir in CMV retinitis.
	Anti-HIV drugs	3	• Classify anti-HIV drugs.

			• Describe the role of entry inhibitors, integrase inhibitors, protease inhibitors, NRTIs and NNRTIs in HIV treatment • Describe adverse effects of Zidovudine and Indinavir • Describe the rationale of HAART therapy.
Pathology	Viruses: Corona	1	Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Corona Virus
	Viruses: HIV		Describe the structure, important properties, pathogenesis and clinical features along with labwork up of HIV
	Viruses: Herpesviruses	1	Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Herpesviruses
	Viruses: Tumor Viruses		Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Tumor viruses
	Viruses: MMR		Describe the structure, important properties, pathogenesis and clinical features along with lab work up of MMR viruses
	Fungi: Aspergillus	1	Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Aspergillus
	Fungi: Candida		Describe the structure, important properties, pathogenesis and clinical features along with lab work up of Candida

	Tenia		Describe the structure, important properties, pathogenesis and clinical features along with labwork up of Tenia
Forensic Medicine	Medico legal issues related to HIV patient	1	Describe legal issues related to HIV patient
	Dactylography		Describe medico legal aspects of dactylography
	DNA finger printing		• Define DNA finger printing • Write its application in forensic practice • Write methods of collection of samples anddispatch to laboratory
	Tattoos, scarmarks, Superimposition		• Describe medico legal aspects of tattoo marks,Describe medico legal aspects of scar tissue, • Describe medico legal aspects of superimposition

	and facial reconstruction		Describe medico legal aspects of facialreconstruction
	Polygraph		Describe medico legal aspects of polygraph
	Narcoanalysis		Describe medico legal aspects of narcoanalysis
Family Medicine	TORCH infections	1	Define TORCH infection
			Describe the steps of investigations for TORCH infections
			Describe the preventive strategies for TORCH infections and their complications

Community Medicine	Epidemiology & control of airborne diseases	1	• Describe the epidemiological determinants, frequency and distribution of measles, mumps, chickenpox, rubella, Diphtheria, Pertissus and meningitis
			• Explain the preventive and control measures of measles, mumps & rubella with reference to Pakistani context.

	Epidemiology & control of Corona virus infection	1	• Describe the epidemiological determinants, frequency and distributionof corona • Compare the prevalence/incidence of corona in different parts of the world. • Describe the preventive and controlmeasures of corona Describe the role of Pakistani government in corona control program.
	Epidemiology and prevention of water borne diseases: • Cholera • Typhoid • Acute Diarrhea and Dysentery • Polio • Hepatitis A and E • Food	2	• Enumerate common water borne diseases • Explain the epidemiology and prevention measures of these diseases • describe the current situation of these diseases on Pakistan and worldwide

	poisoning • Amebiasis and Giardiasis • Brucellosis • Leptospirosis • Worm infestations		

Practical Work

Week 1 Practicals			
Pathology	Cell of inflammation	1.5	Identify Cells of inflammation in the microscope
	Acute Appendicitis	1.5	Identify the histopathological changes in acute appendicitis
Forensic Medicine	Gastric Lavage	1.5	Demonstrate the steps of gastric lavage
Week 2 Practicals			
Pathology	Chronic cholecystitis	1.5	-Identify the morphological changes occurring in chronic cholecystitis
	Granuloma	1.5	- Identify the various cells and their arrangement in a granuloma
Week 3 Practicals			
Pathology	Granulation Tissue	1.5	-Identify the histological features of granulation tissue
Week 4 Practicals			
	Catalase test	1.5	-Perform and interpret the result of catalase test by tube and slide method
	Coagulase test		-Perform and interpret the result of coagulase test by tube method

Pathology	Oxidase test		-Perform and interpret the result of coagulase test
	Culture media		-Identify blood agar, Mannitol salt agar, Chocolate media, Cary Blair transport media in the lab -Identify different types of haemolysis on blood agar
Pharmacology			Prescription Writing
	Acute Tonsillitis	1.5	Construct a prescription for a patient with acute tonsillitis.
Forensic Medicine	Sex determination through bones	1.5	Identify human sex through bones
	Hair, Fibre		Identify human hair through microscopy Differentiate between hair and fibre
Week 5 Practicals			
Pharmacology		Prescription Writing	
	Malaria	1.5	Construct a prescription for a patient with Malaria
Week 6 Practicals			
Pathology	Hydatid Cyst	1.5	Identify cysts and ova of Echinococcus in the lab
	Leishmania		Identify leishmania in slides of bone marrow/ skin biopsies
	Malaria		Identify Malarial parasite trophozoites and gametocytes under microscope

	Taenia saginata/solium		Identify ova of Taenia in the lab
Community medicine	Communicable diseases models	3	Identify the models related to the communicable diseases
			Explain the complication, preventive measures and the identification signs of concerned disease

CLINICAL SUBJECTS							
S#	**MEDCINE**	**SURGERY**	**PAEDS**	**Obs/Gyn**	**ENT**	**EYE**	**PRIME**
1	PUO 1	Surgical infections 1	PUO (better to teach either by Medicine or Paeds if majority content is same/ joint session can be taken) 1	Puerperal pyrexia 1	Acute & chronic Phyrangitis 1	Acute and chronic dacrocystit is 1	Reactionto illness 1
2		Anesthesia & pain relief	Child with Rash 1	Post-operative wound sepsis 1	Acute & chronic Rhinitis 1	Episcleritis 1	Attributes of professionalism-empathy 1
3		Acute abdomen 1			Acute & chronic Sinusitis 2	Infective conjuncti Vitis 1	Steps of research process 1
4					Acute and chronic tonsillitis 1		Identifying study question 2
							Literature review 2

Learning Resources

S.No	Subjects	Textbooks
1.	**Community Medicine**	1.Community Medicine by Parikh 2. Community Medicine by M Illyas 3. Basic Statistics for the Health Sciences by Jan W Kuzma
2.	**Forensic Medicine**	1. Nasib R. Awan. Principles and practice of Forensic Medicine 1st ed. 2002. 2. Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 7th ed.2005. 3.Knight B. Simpson's Forensic Medicine. 11th ed.1993. 4. Knight and Pekka. Principles of forensic medicine. 3rd ed. 2004 5. Krishan VIJ. Text book of forensic medicine and toxicology (principles and practice). 4th ed. 2007 6. Dikshit P.C. Text book of forensic medicine and toxicology. 1st ed. 2010 7. Polson. Polson's Essential of Forensic Medicine. 4th edition. 2010. 8. Rao. Atlas of Forensic Medicine (latest edition). 9. Rao.Practical Forensic Medicine 3rd ed ,2007. 10. Knight: Jimpson's Forensic Medicine 10th 1991,11th ed.1993 11. Taylor's Principles and Practice of Medical Jurisprudence. 15th ed.1999
3.	**Pathology**	1. Robbins & Cotran, Pathologic Basis of Disease, 9th edition. 2. Rapid Review Pathology, 4th edition by Edward F. Goljan MD
4.	**PHARMACOLOGY**	1. Lippincott Illustrated Pharmacology 2. Basic and Clinical Pharmacology by Katzung

Assessment Plan – 3rd Year MBBS

The year-3 will be assessed in 3 blocks

1) Block-1 (Foundation 2 and Infection and Inflammation modules) will be assessed in paper-G
2) Block-2 (Multisystem, blood and MSK modules) will be assessed in paper-H
3) Block-3 (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 below table.
6) In OSPE, each station will be allotted 6 marks, and a total of 120 (+10% marks of internal assessment) marks are allocated for each OSPE/OSCE examination.

Year 3 Professional Exam in System-based Curriculum

Theory paper	Modules	Theory marks	Internal assessment theory (10%)	OSPE/OSPE	Internal assessment OSPE/OSPE (10%)	TOTAL MARKS
Paper G	Foundation-II Inf.&Inflamm.	120	14	120	14	268
Paper H	Multisystem Blood MSK-II	120	13	120	14	267
Paper I	CVS-II Respiratory-II	120	13	120	12	265
TOTAL MARKS		360	40	360	40	800

*Research viva of 20 marks will be conducted in paper-L. However, the rest of 15 marks will be decided by the concerned department internally for the contribution of the students in research project/thesis.

Assessment Blueprints

Table 2: Paper G (Foundation II and Infection & Inflammation)

Subjects	Total MCQs
Infection & Inflammation	54
Foundation - II	66
Total	**120**

Table 3: Paper G OSCEs

Subject	Total OSCE stations
Infection & Inflammation	10
Foundation – II	10
Total	**20**

A minimum of 20 stations will be used in final exams. Total marks will be 120 (6 marks for each station).

Teaching and learning strategies:

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

- Interactive Lectures
- Hospital Clinic visits
- Small Group Discussion
- Skills session
- Self-Directed Study

Interactive lectures:

An interactive lecture is an easy way for instructors to intellectually engage and involve students as active participants in a lecture-based class of any size. Interactive lectures are classes in which the instructor breaks the lecture at least once per class to have students participate in an activity that lets them work directly with the material.

- The instructor might begin the interactive segment with an engagement trigger that captures and maintains student attention.
- Then the instructor incorporates an activity that allows students to apply what they have learned or give them a context for upcoming lecture material.
- As the instructor feels more comfortable using interactive techniques he or she might begin to call upon a blend of various interactive techniques all in one class period.

Hospital/Clinic Visits:

In small groups, students observe patients with signs and symptoms in hospital or clinical settings. This helps students to relate knowledge of basic and clinical sciences of the relevant module.

Small Group Discussion (SGD):

The shy and less articulate are more able to contribute. Students learn from each other. Everyone gets more practice at expressing their ideas. A two way discussion is almost always more creative than individual thoughts. Social skills are practiced in a 'safe' environment e.g. tolerance, cooperation. This format helps students to clarify concepts acquire skills or attitudes. 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.

Skills Practical Session:

Skills relevant to respective module are observed and practiced where applicable in skills laboratory or Laboratories of various departments.

Self-Directed Learning (SDL):

Self-directed learning, which involves studying without direct supervision in a classroomLibrary, is a valuable way to learn and is quickly growing in popularity among parents and students. Students' assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from Learning Resource Centre, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self-study.

Time Table:

The timetables for the module will be shared via Edmodo and the notice boards in advance.

1. Assessment Tools:

Theoretical knowledge is tested by a written examination system constituted by multiple choice questions (MCQs). The assessment of practical knowledge involves oral, spot, or objective structured practical examinations (OSPE).

Multiple Choice Questions (MCQs):

- Multiple choice questions (MCQs) are a form of assessment for which students are asked to select the best choice from a list of answers.
- MCQ consists of a stem and a set of options. The stem is usually the first part of the assessment that presents the question as a problem to be solved; the question can be an incomplete statement which requires to be completed and can include a graph, a picture or any other relevant information. The options are the possible answers that the student can choose from, with the correct answer called the key and the incorrect answers called distractors.
- Correct answer carries one mark, and incorrect 'zero mark'. There is NO negative marking.
- Students mark their responses on specified computer-based sheet designed for the college.
- The block exam will comprise of 120 MCQs and will be compiled according to the shared blueprint.

Objective Structured Practical Examination (OSPE)

- The content may assess application of knowledge, or practical skills.
- Student will complete task in define time at one given station.
- All the students are assessed on the same content by the same examiner in the same allocated time.

- A structured examination will have observed, unobserved, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Unobserved will be static stations in which students will have to answer the questions related to the given pictures, models or specimens the provided response sheet.
- Rest station is a station where there is no task given, and in this time student can organize higher thoughts.
- The Block OSPE will be comprise of 20 examined station and 5 rest stations. The stations will be assigned according to the shred blueprint. There will be 8 stations for viva of core subjects like Pathology, Pharmacology, Forensic Medicine and Community Medicine (2 station for viva of each core subject) and 2 clinical station and rest of 10 out of 20 stations will be assigned according to shared blue prints.

Internal Evaluation:

Internal evaluation is a process of quality review undertaken within an institution for its own ends. 10% marks of internal evaluation will be added to final marks. This 10% will be based on

Marks obtained	**14 out of total 40 marks of internal assessment in block H Paper**

Marks obtained	**14 out of total 40 marks of internal assessment in block H OSPE**

2. Attendance Requirement:

More than 75% attendance is mandatory to sit for the examinations.

Learning Resources for Students

Physiology

- Guyton nd Hall physiology
- Ganong physiology
- Human Physiology from cells to system by lauralee sherwood
- BRS Physiology
- Neuroscience by Dale Purves

Biochemistry

- Chatterjee text book of Biochemistry
- Harpers Biochemistry
- Lippincotts Biochemistry
- Satya Narayan biochemistry

PATHOLOGY

- Robbins textbook of pathology
- Harsh mohan text book of pathology
- Levison text book of microbiology
- Paniker parasitology
- Chatterjee book of parasitology

PHARMACOLOGY

- Basic & Clinical Pharmacology, 14edition
- Katzung & Trevor's Pharmacology: Examination & Board Review, 10edition
- Lippincott Illustrated Reviews: Pharmacology, 8th edition
- Pharmacology for Medical Graduates by Tara V. Shanbhag

FORENSIC MEDICINE

- Parikh’s textbook of Medical Jurisprudence and Toxicology.
- Principles and Practice of Forensic Medicine by Nasir R Awan
- Forensic medicine and toxicology principals and practice by Krishan Vij
- Knights forensic pathology by Bernard knight, Pekka saukko
- Forensic medicine and toxicology Nagesh Kumar G rao

Apart from this resource learning, students can consult books available in library or recommended by the specialty experts.