



# INFECTION AND INFLAMMATION MODULE

## 3<sup>RD</sup> YEAR MBBS

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**Khyber Medical University (KMU) Vision:**

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

**Khyber Medical University (KMU) Mission:**

Khyber Medical University aims to promote professional competence through learning and innovation for providing comprehensive quality health care to the nation.

**Institute of Health Professions Education & Research (IHPER) Mission:**

To produce leaders, innovators and researchers in health professions education who can apply global knowledge to resolve local issues.

# 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 3<sup>rd</sup> 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	
<b>Pharmacology</b>	Overview to anti-inflammatory drugs	1	<ul style="list-style-type: none"> <li>-Classify anti-inflammatory drugs</li> <li>-Describe the role of DMARDs and glucocorticoids as anti-inflammatory agents</li> </ul>	
	NSAIDs (Non-selective COX inhibitors: Aspirin & other commonly used NSAIDs)			-Classify NSAIDs
				-Differentiate between non-selective COX inhibitors 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

			<ul style="list-style-type: none"> <li>-Describe the pharmacokinetics with emphasis on dosage, duration of action and elimination of Diclofenac, Ibuprofen, Indomethacin, Mefanamic acid and Piroxicam in contrast to Aspirin</li> <li>-Relate pharmacokinetics and pharmacodynamics of NSAIDs to their clinical applications</li> </ul>
	Selective COX-2 inhibitors	1	<ul style="list-style-type: none"> <li>-Describe the mechanism of action of selective COX-2 inhibitors.</li> <li>-Describe the clinical uses of selective COX-2 inhibitors</li> <li>-Describe the adverse effects of selective COX-2 inhibitors</li> <li>-Describe the merits and demerits of selective COX-2 inhibitors and non-selective COXinhibitors.</li> </ul>
	Paracetamol (Acetaminophen)		<ul style="list-style-type: none"> <li>-Describe the pharmacokinetics of Paracetamol</li> <li>-Describe the mechanism of action of Paracetamol.</li> <li>-Describe the clinical uses of Paracetamol.</li> <li>-Describe the adverse effects of Paracetamol.</li> <li>-Give therapeutic and fatal doses of Paracetamol.</li> <li>-Describe the drug treatment of Paracetamol poisoning</li> </ul>



<b>Pathology</b>	Cells of Inflammation	1	<ul style="list-style-type: none"> <li>-Describe different cells of inflammation</li> <li>-Describe the functions of various cells of inflammation</li> <li>- Enumerate different causes of leukopenia and leucocytosis(each neutrophil, lymphocyte, monocyte, eosinophil, basophil seperately)</li> </ul>
	Overview to Acute Inflammation and vascular phase	1	<ul style="list-style-type: none"> <li>-Define acute inflammation</li> <li>-Describe causes of acute inflammation</li> <li>-Describe the vascular events of acute inflammation</li> </ul>
	Recognition of microbes	1	<ul style="list-style-type: none"> <li>-Describe various molecular patterns and appropriate receptors used by the inflammatory cells to identify microbes</li> <li>-Relate the recognition of microbes to the initiation of inflammation</li> </ul>
	Cellular phase of acute inflammation	1	<ul style="list-style-type: none"> <li>-Describe the sequence of events and cellular changes involved in cellular phase of acute inflammation</li> </ul>
	Plasma Derived Mediators	1	<ul style="list-style-type: none"> <li>-Enumerate plasma derived mediators</li> <li>-Enlist the functions of each mediator</li> <li>-Describe the different cascades involved in the generation of mediators</li> </ul>
	Cell Derived Mediators		<ul style="list-style-type: none"> <li>-Enumerate cell derived mediators</li> <li>-Enlist the functions of each mediator</li> </ul>

**Theme (Pain and Fatigue)**

Subjects	Topics	Hours	Los
Pharmacology	Anti-histamines	1	<ul style="list-style-type: none"> <li>-Classify anti-histamines</li> <li>-Differentiate between first and second generation anti-histamines</li> <li>-Describe the pharmacologic effects of H1-receptor antagonists.</li> <li>-Describe the clinical uses of H1-receptor antagonists.</li> <li>-Enlist the adverse effects of H1-receptor antagonists.</li> <li>-Describe the drug interactions of H1-receptor antagonists.</li> </ul>
	Serotonin agonist and antagonist	1	<ul style="list-style-type: none"> <li>- Enlist serotonin agonists</li> <li>- Classify serotonin antagonists</li> <li>- Describe the mechanism of action of serotonin</li> <li>- Describe the organ system effects of serotonin.</li> <li>- Describe the clinical uses of serotonin agonists and antagonists</li> <li>- Describe the pharmacological basis of ondansetron in chemotherapy induced vomiting</li> </ul>

Pathology	Morphological patterns, outcomes, defects of inflammation	1	<ul style="list-style-type: none"> <li>-Enumerate the different morphological patterns of inflammation</li> <li>-Describe the histological changes in each pattern</li> <li>- Enlist the outcomes of inflammation</li> <li>-Enumerate the various defects of inflammation</li> <li>-Describe the consequences of the defects of inflammation</li> </ul>
	Overview to chronic inflammation	1	<ul style="list-style-type: none"> <li>-Define chronic inflammation</li> <li>-Differentiate chronic from acute inflammation</li> <li>-Describe the causes and morphological features of chronic inflammation</li> </ul>
	Granulomatous inflammation	1	Define granulomatous inflammation
			-Describe the morphological features and mediators involved in granulomatous inflammation
	Cells and mediators of chronic inflammation	1	<ul style="list-style-type: none"> <li>-Enlist the cells of chronic inflammation</li> <li>-Enumerate the mediators of chronic inflammation</li> <li>-Describe the function of the mediators</li> <li>-Relate the functions of mediators to the morphological changes seen in chronic inflammation</li> </ul>
Systemic effects of inflammation	1	<ul style="list-style-type: none"> <li>-Enumerate the systemic effects of inflammation</li> <li>-Describe the pathophysiology of the systemic effects of inflammation</li> </ul>	

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	<ul style="list-style-type: none"> <li>• Define incubation period</li> <li>• Explain the principles of disease eradication and control</li> <li>• Define serial intervals</li> <li>• Define infectivity period</li> </ul>
	Infection control	2	<ul style="list-style-type: none"> <li>• Define the basic definition related to infectious disease epidemiology</li> <li>• Review the role of susceptible host for successful parasitism, modes of transmission and the host defense system</li> <li>• 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).</li> <li>• Enlist the common infectious diseases affecting the population of Pakistan as per National institute of Health Pakistan.</li> <li>• Explain the effect of climate change and seasonal variation on specific diseases globally and in Pakistan.</li> <li>• Explain the role of personal hygiene &amp; PPE in infection control.</li> </ul>

	<ul style="list-style-type: none"> <li>• Disease careers</li> <li>• Reservoirs of infection</li> <li>• Disinfection</li> <li>• Communicable disease control measure (aimed at agent, host, others, administrative measures and vector control measures)</li> </ul>	1	<ul style="list-style-type: none"> <li>• Define disease careers</li> <li>• Explain the reservoirs of infection</li> <li>• Differentiate between sterilization and disinfection</li> <li>• Explain the types and procedures of disinfection</li> <li>• Discuss Communicable disease control measure (aimed at agent, host, others, administrative measures and vector control measures)</li> </ul>
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Theme (Trauma and repair)			
Subjects	Topics	Hours	LOs
Pathology	Prostaglandins	1	<ul style="list-style-type: none"> <li>- Enlist various prostaglandins-</li> <li>- Describe the mechanism of action of Prostaglandins.</li> <li>- Describe the organ system effects of Prostaglandins.</li> <li>- Describe the clinical uses of Prostaglandins.</li> </ul>
	Overview to tissue healing and repair	1	<ul style="list-style-type: none"> <li>-Differentiate between regeneration and repair</li> <li>-Describe various steps involved in the process of tissue healing and repair</li> </ul>
	Tissue regeneration		<ul style="list-style-type: none"> <li>-Define regeneration</li> <li>-Enlist organs capable of regeneration</li> <li>-Describe the process and mediators involved in regeneration</li> </ul>
	Cell Cycle and its role in repair		<ul style="list-style-type: none"> <li>-Define cell cycle</li> <li>-Describe the initiation, various phases and proteins involved in the cell cycle</li> <li>-Discuss cells capable of entering the cell cycle</li> <li>-Describe proliferative capabilities of various cells</li> </ul>

	Repair by scarring	1	-Describe the various steps involved in process of repair by scarring -Describe the various mediators involved in the steps of scarring
	Growth factors and receptors	1	-enumerate various growth factors and their receptors -Describe the most common pathways by which growth 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/abnormal scarring	1	-Enlist the various factors that influence wound healing -Describe the mechanism by which these factors affect 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 by aspirin and paracetamol

Community Medicine	Nosocomial infection & its control	1	<ul style="list-style-type: none"> <li>• Describe the prevalence of the nosocomial infections globally and Specifically in Pakistan.</li> <li>• Identify the cause of nosocomial infections in Pakistan.</li> <li>• Enlist common nosocomial infections.</li> <li>• Describe the importance of different modes of transmission for causation of the nosocomial infections.</li> <li>• Explain the control &amp; preventive measures for nosocomial infections</li> </ul>
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Theme (Fever and Infection)			
Subjects	Topics	Hours	Los
Pharmacology	Introduction to Chemotherapy	2	<ol style="list-style-type: none"> <li>1. Define basic terms like chemotherapy, antibiotic, antimicrobial, MIC, MBC, chemoprophylaxis, empirical therapy and post-antibiotic effect, bacteriostatic and bactericidal antimicrobials.</li> <li>2. Explain advantages of drug combinations.</li> <li>3. Describe various mechanisms of bacterial resistance against antibiotics.</li> <li>4. Differentiate between concentration and time dependent killing with examples.</li> <li>5. Classify antimicrobials on the basis of mechanism of action (MOA)</li> </ol>
	Penicillins	2	<ol style="list-style-type: none"> <li>1. Classify beta-lactam antibiotics</li> <li>2. Enlist narrow and broad spectrum Penicillins.</li> <li>3. Enlist anti-pseudomonal, anti-staphylococcal/ beta lactamase resistant Penicillin.</li> <li>4. Enlist long- and short-acting Penicillins</li> <li>5. Describe anti-bacterial spectrum of Penicillins.</li> <li>6. Describe pharmacokinetics in respect of emphasis on route of administration and excretion of Penicillins</li> </ol>

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

	Monobactams & Carbapenem,	1	<ol style="list-style-type: none"> <li>1. Describe the antibacterial spectrum of Monobactams and Carbapenem</li> <li>2. Describe the clinical uses of Monobactams and Carbapenem</li> </ol>
	Vancomycin	1	<ol style="list-style-type: none"> <li>1. Describe the MOA of Vancomycin.</li> <li>2. Describe clinical uses of Vancomycin</li> <li>3. Describe the use of vancomycin in MRSA (Methicillin-resistant Staph aureus).</li> <li>4. Describe adverse effects of Vancomycin</li> <li>5. Describe “Red man/Red neck” syndrome.</li> </ol>
	Fosfomycin Bacitracin & Cycloserine	1	<ol style="list-style-type: none"> <li>1. Enlist clinical uses of Fosfomycin, Bacitracin &amp; Cycloserine</li> </ol>
	Protein synthesis inhibitors:	1	Classify bacterial protein synthesis inhibitors
	Tetracyclines	1	<ul style="list-style-type: none"> <li>• Classify Tetracyclines.</li> <li>• Describe anti-bacterial spectrum of Tetracyclines.</li> <li>• Describe the pharmacokinetics of Tetracycline with special emphasis on absorption of Tetracyclines.</li> <li>• Describe mechanism of action of Tetracyclines.</li> <li>• Describe the principal mechanism of resistance to Tetracyclines.</li> <li>• Describe clinical uses of Tetracyclines.</li> <li>• Describe adverse effects of Tetracyclines</li> <li>• Describe Black Bone disease.</li> </ul>

			<ul style="list-style-type: none"> <li>• Describe the teratogenic effects of Tetracyclines.</li> <li>• Describe drug interactions of Tetracyclines.</li> <li>• Describe the adverse effect related to the use of outdated (expired) Tetracycline products.</li> <li>• Relate pharmacokinetics and</li> <li>• pharmacodynamics of Tetracycline with their clinical applications / uses.</li> </ul>
<b>Pathology</b>	Bacteria: Pyrogenic Bacteria	1	<ul style="list-style-type: none"> <li>-Define boil and furuncle</li> <li>-Enlist organisms responsible for pyrogenic infections</li> <li>-Describe important properties, pathophysiology, lab diagnosis of GPC &amp; GNC</li> </ul>
	Bacteria: Rickettsia	1	<ul style="list-style-type: none"> <li>-Define Rickettsia</li> <li>-Describe the important properties, pathophysiology, lab diagnosis of diseases caused by Rickettsia</li> </ul>
	Spore forming GProds	1	<ul style="list-style-type: none"> <li>-Enumerate spore forming GP rods</li> <li>- Describe the important properties, pathophysiology, clinical features and lab diagnosis of spore forming GP rods</li> </ul>
	Non Spore forming GP 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	<ul style="list-style-type: none"> <li>• Enlist Aminoglycosides.</li> <li>• Describe anti-bacterial spectrum of Aminoglycosides.</li> <li>• Describe the pharmacokinetics of Aminoglycosides with special emphasis on route of administration, concentration-dependent killing and post-antibiotic effect.</li> <li>• Describe mechanism of action of Aminoglycosides.</li> <li>• Describe the principal mechanism of resistance to Aminoglycosides.</li> <li>• Describe clinical uses of Aminoglycosides.</li> <li>• Describe adverse effects of Aminoglycosides.</li> <li>• Describe the drug interactions of Aminoglycosides.</li> <li>• Relate pharmacokinetics and pharmacodynamics of Aminoglycosides with their clinical applications / uses.</li> </ul>

	Macrolides & other related drugs	2	<ul style="list-style-type: none"> <li>• Enlist Macrolides.</li> <li>• Describe anti-microbial spectrum of Macrolides</li> <li>• Describe pharmacokinetics of Macrolides</li> <li>• Describe the mechanism of action of Macrolides</li> <li>• Describe the principal mechanism of resistance to Macrolides</li> <li>• Describe clinical uses of Macrolides</li> <li>• Describe adverse effects of Macrolides.</li> <li>• Describe drug interactions of Macrolides</li> <li>• Differentiate the salient features of Erythromycin, Clarithromycin and Azithromycin in respect of dosing and clinical use.</li> <li>• Relate pharmacokinetics and pharmacodynamics of Macrolides with their clinical applications / uses.</li> </ul>
	Linezolid	1	<ul style="list-style-type: none"> <li>• Describe mechanism of action of Linezolid</li> <li>• Describe clinical uses of Linezolid with special emphasis on methicillin-resistant staphylococci and vancomycin-resistant enterococci</li> </ul>
	Clindamycin		<ul style="list-style-type: none"> <li>• Describe mechanism of action of Clindamycin.</li> <li>• Enumerate clinical uses of Clindamycin.</li> <li>• Describe antibiotic-associated (pseudomembranous) colitis.</li> </ul>
	Streptogramins		<ul style="list-style-type: none"> <li>• Enumerate Streptogramins.</li> <li>• Describe clinical use of Quinupristin-Dalfopristin in VRE (Vancomycin-resistant enterococci).</li> </ul>

	Chloramphenicol	1	<ul style="list-style-type: none"> <li>• Describe anti-microbial spectrum of Chloramphenicol</li> <li>• Describe mechanism of action of Chloramphenicol</li> <li>• Enlist clinical uses of Chloramphenicol</li> <li>• Describe the reason for obsoleting the systemic use of Chloramphenicol</li> <li>• Enlist adverse effects of Chloramphenicol</li> </ul>
	Quinolones	1	<ul style="list-style-type: none"> <li>• Describe Gray baby syndrome.</li> <li>• Classify Quinolones.</li> <li>• Describe the pharmacokinetics of Fluroquinolones with special emphasis on half-life of Moxifloxacin</li> <li>• Enlist respiratory Quinolones.</li> <li>• Describe anti-microbial spectrum of Fluoroquinolones.</li> <li>• Describe mechanism of action of Fluoroquinolones.</li> <li>• Describe the principal mechanism of resistance to Fluroquinolones,</li> <li>• Describe clinical uses of Fluroquinolones</li> <li>• Describe adverse effects of Fluroquinolones</li> <li>• Describe drug interactions of Fluroquinolones</li> <li>• Relate pharmacokinetics and pharmacodynamics of Fluoroquinolones with their clinical applications / use.</li> </ul>



	Sulfonamides and Trimethoprim	2	<ul style="list-style-type: none"> <li>• Classify Sulfonamides</li> <li>• Describe anti-microbial spectrum of Sulfonamides</li> <li>• Describe mechanism of action of Sulfonamides and Trimethoprim</li> <li>• Describe mechanism of resistance to Sulfonamides</li> <li>• Describe clinical uses of Sulfonamides and Trimethoprim</li> <li>• Describe adverse effects of Sulfonamides and Trimethoprim</li> <li>• Describe the advantages of combining sulfamethoxazole with trimethoprim (Co-Trimoxazole)</li> <li>• Describe the drug interaction of Sulphonamides with Phenytoin.</li> </ul>
	Parasites: Hydatid Cyst	1	<ul style="list-style-type: none"> <li>• Describe the life cycle and important properties of Echinococcus</li> <li>• Relate the pathogenesis to the clinical features and lab work up of Echinococcus</li> <li>• Identify cysts of Echinococcus in the lab</li> </ul>
	Leishmania		<ul style="list-style-type: none"> <li>• Describe the life cycle, and important properties of Leishmania</li> <li>• Relate the pathogenesis to the clinical features and lab work up of Leishmania</li> </ul>

Pathology	Toxoplasma	2	<ul style="list-style-type: none"> <li>Describe the life cycle and important properties of Toxoplasma</li> <li>Relate the pathogenesis to the clinical features and lab work up of Toxoplasma</li> </ul>
	Malaria		<ul style="list-style-type: none"> <li>Describe the life cycle and important properties of Malarial parasite</li> <li>Relate the pathogenesis to the clinical features and lab work up of Malaria</li> </ul>
	Tenia		<ul style="list-style-type: none"> <li>Describe the life cycle, important properties, of Tenia saginata and solium</li> <li>Relate pathogenesis to the clinical features and lab work up of Tenia saginata and solium</li> </ul>
Forensic Medicine	Sex determination	2	Describe parameters of sex determination
	Race determination		Describe parameters of race determination
	Examination of hair		Describe medico legal aspects of hair
	Forensic odontology		Write the application of odontology in forensic medicine
	Forensic Anthropometry		Describe medico legal aspects of forensic anthropometry

Community Medicine	Epidemiology and control of vector borne diseases	2	<ul style="list-style-type: none"> <li>• Describe the epidemiological determinants, frequency and distribution of Malaria</li> <li>• Compare the prevalence/incidence of malaria in different provinces of Pakistan.</li> <li>• Explain the preventive and control measures of Malaria</li> <li>• Describe the scope/function of Malaria control program.</li> <li>• Explain the types, risk factors, complications and control measures of viral hemorrhagic fevers including Dengue fever</li> </ul>
	Epidemiology & control of Leishmaniasis	1	<ul style="list-style-type: none"> <li>• Describe the epidemiological determinants, frequency and distribution of Leishmaniasis</li> <li>• Explain the preventive and control measures of Leishmaniasis</li> </ul>
	zoonotic and direct contagious diseases	2	<ul style="list-style-type: none"> <li>• Explain the pre and post exposure prophylaxis of Rabies</li> <li>• Explain the epidemiology, types of Anthrax and its preventive measures</li> <li>• Discuss the history, types and prevention of Plague</li> <li>• Explain the etiology, risk factors, clinical features and prevention of Brucellosis</li> <li>• Explain the preventive measures of Scabies</li> <li>• Discuss the etiology, risk factors, clinical features and prophylaxis of pre and post exposure of Tetanus</li> </ul>

	<ul style="list-style-type: none"> <li>• Leprosy</li> <li>• Trachoma</li> </ul>		<ul style="list-style-type: none"> <li>• Explain the etiology, risk factors, stages and preventive measures of Leprosy</li> <li>• Explain the etiology, risk factors, complications and preventive measures of Trachoma</li> </ul>
Family medicine	Malaria & Hepatitis1 control program teams		<ul style="list-style-type: none"> <li>• Explain the etiology, clinical features, types, investigations and management of Malaria in family practice</li> </ul>
			<ul style="list-style-type: none"> <li>• Describe the red-flags in a patient with Malaria for referral to specialty care</li> </ul>
			<ul style="list-style-type: none"> <li>• Identify at risk patients of hepatitis and Malaria and offer them screening</li> </ul>

Theme (Fever and Infection)			
Subjects	Topics	Hours	Los
Pharmacology	Antimalarials	3	<ul style="list-style-type: none"> <li>Describe terms like chemoprophylaxis, causal prophylaxis, terminal prophylaxis and radical cure with examples of drugs.</li> <li>Classify antimalarial drugs.</li> <li>Enlist drugs used for chemoprophylaxis of malaria.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>Enlist drugs used for radical cure of malaria.</li> <li>Describe the pharmacokinetics of Chloroquine with special emphasis on volume of distribution and dosing</li> <li>Describe mechanism of action of Chloroquine, Quinine, Mefloquine, Halofantrine, Primaquine, Pyrimethamine and Artemisinin.</li> <li>Describe adverse effects of antimalarial drugs</li> <li>Describe Cinchonism and Blackwater fever.</li> <li>Enlist the antimalarial drugs relatively safe in pregnancy.</li> <li>Describe the antimalarial drugs contraindicated in G6PD deficiency.</li> <li>Relate pharmacokinetics and pharmacodynamics of antimalarial drugs with their clinical applications / use.</li> </ul>

	Antifungal drugs	2	<ul style="list-style-type: none"> <li>• Classify Antifungal drugs.</li> <li>• Describe the pharmacokinetics of Amphotericin B and Ketoconazole</li> <li>• Describe the advantages of liposomal preparation of Amphotericin B</li> <li>• Describe mechanism of action of Azoles, Amphotericin B, Griseofulvin, Terbinafine, and Nystatin.</li> <li>• Describe clinical uses of Azoles, Amphotericin B, Griseofulvin, Terbinafine, and Nystatin.</li> <li>• Describe adverse effects of Azoles, Amphotericin B, Griseofulvin, Terbinafine, and Nystatin.</li> <li>• Describe drug interactions of Ketoconazole and Amphotericin B</li> </ul>
	Antivirals	1	<ul style="list-style-type: none"> <li>• Classify antiviral drugs</li> </ul>
	Anti-herpes	1	<ul style="list-style-type: none"> <li>• Enlist anti- Herpes drugs</li> <li>• Describe the pharmacokinetics of Acyclovir</li> <li>• Describe mechanism of action of Acyclovir</li> <li>• Describe clinical uses of Acyclovir.</li> <li>• Describe adverse effects of Acyclovir Describe the role of Ganciclovir in CMV retinitis.</li> </ul>
	Anti-HIV drugs	3	<ul style="list-style-type: none"> <li>• Classify anti-HIV drugs.</li> </ul>

			<ul style="list-style-type: none"> <li>• Describe the role of entry inhibitors, integrase inhibitors, protease inhibitors, NRTIs and NNRTIs in HIV treatment</li> <li>• Describe adverse effects of Zidovudine and Indinavir</li> <li>• Describe the rationale of HAART therapy.</li> </ul>
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		<ul style="list-style-type: none"> <li>• Define DNA finger printing</li> <li>• Write its application in forensic practice</li> <li>• Write methods of collection of samples and dispatch to laboratory</li> </ul>
	Tattoos, scarmarks, Superimposition		<ul style="list-style-type: none"> <li>• Describe medico legal aspects of tattoo marks, Describe medico legal aspects of scar tissue,</li> <li>• Describe medico legal aspects of superimposition</li> </ul>



	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	<ul style="list-style-type: none"> <li>Describe the epidemiological determinants, frequency and distribution of measles, mumps, chickenpox, rubella, Diphtheria, Pertissus and meningitis</li> </ul>
			<ul style="list-style-type: none"> <li>Explain the preventive and control measures of measles, mumps &amp; rubella with reference to Pakistani context.</li> </ul>

	Epidemiology & control of Corona virus infection	1	<ul style="list-style-type: none"> <li>• Describe the epidemiological determinants, frequency and distribution of corona</li> <li>• Compare the prevalence/incidence of corona in different parts of the world.</li> <li>• Describe the preventive and control measures of corona Describe the role of Pakistani government in corona control program.</li> </ul>
	<p>Epidemiology and prevention of water borne diseases:</p> <ul style="list-style-type: none"> <li>• Cholera</li> <li>• Typhoid</li> <li>• Acute Diarrhea and Dysentery</li> <li>• Polio</li> <li>• Hepatitis A and E</li> <li>• Food</li> </ul>	2	<ul style="list-style-type: none"> <li>• Enumerate common water borne diseases</li> <li>• Explain the epidemiology and prevention measures of these diseases</li> <li>• describe the current situation of these diseases on Pakistan and worldwide</li> </ul>

	<p>poisoning</p> <ul style="list-style-type: none"><li>• Amebiasis and Giardiasis</li><li>• Brucellosis</li><li>• Leptospirosis</li><li>• Worm infestations</li></ul>		
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# 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
<b>Week 5 Practicals</b>			
Pharmacology			Prescription Writing
	Malaria	1.5	Construct a prescription for a patient with Malaria
<b>Week 6 Practicals</b>			
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 Pharyngitis 1	Acute and chronic dacryocystitis 1	Reaction to illness 1
2		Anesthesia & pain relief 1	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 conjunctivitis 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	120	14	120	14	268
	Inf.&Inflamm.					
Paper H	Multisystem Blood	120	13	120	14	267
	MSK-II					
Paper I	CVS-II	120	13	120	12	265
	Respiratory-II					
<b>TOTAL MARKS</b>		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
<b>Total</b>	<b>120</b>

Table 3: Paper G OSCEs

Subject	Total OSCE stations
Infection & Inflammation	10
Foundation - II	10
<b>Total</b>	<b>20</b>

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