RIHS MEDICAL & DENTAL COLLEGE

MODULE VII (CODE: 20407)
MODULE VIII (CODE: 20408)

Session 2025-26

SECOND YEAR BDS

STUDYGUIDE

PLANNED & DESIGNED BY:
DME, RIHS

Module 20407
Module 20408

Placement in curriculum: Module code: 20407(Year 2, Block code- 04, Module code 07)

Module code: 20408 (Year 2, Block code 04, Module code 08)
Pre-requisite: 1ST YEAR BLOCK EXAMS

Teaching faculty & Curriculum committee members

	Disciplines	Name of Faculty
1.	**Principal**	**Prof. Saad Asad**
2.	**Pharmacology**	**Prof. Seemi Gul**
3.	**Pathology**	**Dr. Shafaq Khadija**
4.	**Dental Materials**	**Prof. Sadaf Humayoun**
5.	**Community Dentistry**	**Prof. Rubina Mumtaz**
6.	**Junior Prosthetics**	**Dr. Aqsa Akhtar**
7.	**Junior Operatives**	**Dr. Abeer**
8.	**Behavioral Sciences**	**Ms. Nargis Munir**
11.	**DME**	**Dr. Madiha Akhwand**
Block duration		**12 Weeks**
Block Coordinator		**Prof. Seemi Gul**

RIHS Vision & Mission	**VISION:** • Rawal Institute of Health Sciences (RIHS), Islamabad, envisions to become a globally recognized institution dedicated to advancing health, well-being, and medical knowledge through innovative education, trans formative research, and compassionate care. • Our system will empower the next generation of health professionals with the skills, ethics, and leadership required to address the evolving healthcare challenges of the future. • Through a commitment to excellence, sustainability, and human-centered care, we aim to set the standard for health sciences education and make a profound impact on global health systems for the under-privileged communities. **MISSION:** "Empowering education and Health care services through Research and development cultivating future Health Professionals"
Block Rationale:	Block IV is designed to provide dental students with a comprehensive and interconnected understanding of pathology, pharmacology, dental materials, community dentistry, pre-operative and pre-prosthodontics. By weaving together diverse topics such as cellular responses to stress, microbial infections, drug pharmacokinetics and pharmacodynamics, dental biomaterial properties, public health principles, and prosthodontic techniques, the curriculum aims to foster a holistic perspective essential for future dental practitioners. This integrated approach not only facilitates a more seamless comprehension of the intricate relationships between different disciplines but also promotes the development of critical thinking and problem-solving skills necessary for addressing complex oral health issues. Through the synthesis of theoretical knowledge and practical applications, students are better equipped to navigate the multifaceted challenges presented in dental practice, ensuring a well-rounded education that aligns with the dynamic nature of modern dentistry.
Block Outcomes	**Module 7:** By the end of module 7 of block IV, the students will be able to; • Define general terms relevant to pathology and describe the mechanism of cellular response to stress and toxic insults, cellular adaptation, cell injury, cell death, apoptosis and intracellular accumulations. • Classify the medically important bacteria, viruses, parasites and fungi, and know the pathogenesis and diagnosis of bacterial, viral, parasitic and fungal infections • Describe the pharmacokinetics, drug absorption, drug distribution, drug metabolism, drug excretion. • Understand the concept of pharmacodynamics of drugs. • Describe the drugs acting on the Autonomic nervous system. • Explain the pharmacokinetics, drug absorption, distribution, metabolism and excretion of drugs acting on the Autonomic nervous system. • Explain the pharmacodynamics, mechanism of action, therapeutic uses,

	adverse effects and interactions of drugs acting on Autonomic nervous system. • Know the classification and criterion for selection of dental biomaterials. • Understand the mechanical and physical properties of dental biomaterials and their relevance with enamel and dentin • Describe and discuss various impression materials required for making a cast and manipulate them to required consistency. • Know the biocompatibility of various dental materials • Summarize the science, philosophy and ethics of dental public health • Differentiate the concepts of health, illness, disease and preventive approaches • Discuss world heath organizations and their role in global public health • Know how to manipulate wrought wires for making clasps for removable prosthodontics and orthodontic appliances • Know the Kennedy's classification of partially dentate arches • Describe the GV Black's classification and know the principles of tooth preparation • Identify dental instruments and prepare class I cavity on plaster model **Module 8:** By the end of Module 8 of Block IV, the students will be able to; • Know the feature and causes of acute and chronic inflammation and mechanism of repair • Describe different drugs used as antimicrobials. • Explain the pharmacokinetics, absorption, distribution, metabolism, excretion of drugs used as antimicrobials • Explain the pharmacodynamics, mechanism of action, therapeutic uses, and adverse effects of drugs acting as antimicrobials as well as drug interactions of these antimicrobials. • Know various methods of sterilization and disinfection • Discuss the structure, properties and applications of metals & alloys • Discuss the types, properties and clinical applications of wrought alloys • Describe the types and composition of gypsum products and discuss the manufacturing, properties along with clinical applications of gypsum products for applications in dentistry

	• Demonstrate the science and application of dental caries and oral hygiene indices • Demonstrate the science and application of periodontal and fluorosis indices; WHO assessment tools • Describe the framework of Pakistan's health-care system and the dental workforce
Teaching & Learning Methodologies	**Interactive Lecture (IL):** The goal of interactive lecture is to engage the students' attention, through ways to interact with the content, the instructor, and their classmates. Accordingly, interactive lectures include segments of knowledge transfer combined with segments where students interact. One of the things that make the lecture interactive is the ability of the instructor to select the content of the lecture segments based on the students' needs. This demands a prior search for the baseline knowledge of the students at the start of the lecture. If students have difficulty answering a question, or an activity fails to develop the concept in most student groups, it's time to find a new and better way to deal with the material. LGIS clearly gives a better concept of the content and keeps students' attention captured throughout, as compared to yester years' didactic lectures. **Small Group Discussion (SGD):** 'The purpose and technique of small group teaching is that it is learner-centered, with all students joining in free discussion on a particular topic. A typical 'small group' is around eight to 12 learners facilitated by a teacher. The steps of SGD are Forming, Storming, Norming & Performing. The teacher acts only as a facilitator. Students are allowed to use their books or other search material during the discussion. SGD is a good method to clear the concepts and develop communication and conflict solving skills in the students. **Departmental teaching labs:** This is performance-based teaching & learning methodology where students learn handling and uses of laboratory equipment and models, safety rules and various clinical skills. **Dissection/ Model Demonstration:** Where necessary teaching of gross Anatomy is aided by cadaver dissection / model demonstration. **Problem based/ Task based/ Case based learning (PBL/TBL/CBL):** Students are presented with real life problems/tasks/cases. They are motivated through a standard process to seek answers to the given problem, task or case. This is a highly effective method to capture and maintain students' interest in patients' problems and their solution. **Self-directed learning (SDL):** is the basic requirement for the successful implementation of the PBL curriculum. Students need ample time to research for their learning needs. **Assignments and Presentations:** Both of methodologies are meant to make the students self-directed learners and good communicators by seeking knowledge from multiple sources and presenting it. **Multidisciplinary Seminars (MDS):** in which groups of students are encouraged to independently present topics of general interest before a larger audience. This encourages students to read beyond their textbooks and learn to support their knowledge with research. **Skill Lab Sessions:** students in groups will learn various behavioral

	and practical skills essential for a competent doctor. This will involve working with simulation aids, procedure demonstrations, role plays etc. **Web- based learning/Hybrid/Blended learning:** Refers to the type of learning that uses the Internet as an instructional delivery tool to carry out various learning activities. It can take the form of (1) a pure online learning in which the curriculum and learning are implemented online without face-to-face meeting between the instructor and the students, or (2) a hybrid in which the instructor meets the student's half of the time online and half of the time in the classroom, depending on the needs and requirement of the curriculum. Discussion forums are being conducted via email, videoconferencing, and live lectures. **Flipped classroom:** A flipped classroom is an educational strategy where students are introduced to new content before class, freeing up in-class time for interactive, higher-order thinking activities, rather than traditional lectures or passive instruction.
Assessment methodology:	• **Multiple Choice Questions (MCQs): Single best type** • **Structured Viva:** • **Objective Structured Practical/Clinical Examination (OSPE /OSCE)**

MODULE 7:

LEARNING OBJECTIVES	**IT**	**AT**	**COGNITIVE DOMAIN**
Introduction to pharmacology • Define the term pharmacology • Define drug according to WHO • Describe the different branches of pharmacology • Describe different Pharmacopoeia • Describe drug nomenclature	IL SGD	MCQ VIVA	C
Development and evaluation of drugs • Describe approaches in drug discovery • Describe screening of new drugs • Describe 4 phases of clinical trials of a new drug	SGD	MCQ	C PA

Sources and active principles of drugs, Structure-activity relationship of drugs • Describe the sources and active principles of drugs • Describe the Structure-activity relationship of drugs	IL	MCQ VIVA	C
Bioavailability • Define bioavailability of drug • Describe the factors affecting bioavailability of drug • Explain first-pass elimination and extraction ratio • Describe clinical significance of bioavailability • Explain bioequivalence and therapeutic equivalence	IL	MCQ	C
Distribution of Drug & Volume of distribution • Explain drug distribution • Describe factors affecting distribution of a drug • Describe the distribution of a drug through various body compartments • Explain volume of distribution (Vd) • Calculate Vd using appropriate the formula • Describe clinical significance of Vd • Describe the characteristics of a drug that is bound to plasma proteins • Explain redistribution • Describe drug reservoirs	IL	MCQ	C
Biotransformation of Drug • Define biotransformation of drug. • Describe the main objective of biotransformation of drugs. • Explain a 'prodrug.' • Name the different sites of biotransformation of drug. • Describe the different types, patterns and chemical reactions of biotransformation of drug. • Enlist phase I and phase II biotransformation reactions • Describe microsomal and non-microsomal biotransformation reactions • Describe the microsomal oxidation system • Describe characteristics of Phase 2 biotransformation reactions • Explain Hoffman's elimination • Describe the factors affecting the biotransformation of drug. • Describe toxic biotransformation • Describe the clinical importance of biotransformation	ILx2	MCQ	C
Plasma Half-Life • Explain plasma half-life • Define steady-state concentration and give its clinical significance • Explain clinical significance of plasma half-life • Describe factors affecting half-life • Explain Maintenance and Loading doses with examples	IL	MCQ	C

Drug elimination/ excretion • Describe drug excretion • Enlist routes of drug excretion • Describe processes of drug excretion through the kidneys • Describe the clinical significance of glomerular filtration, active tubular secretion and passive tubular reabsorption of drugs • Explain drug clearance • Describe factors affecting drug clearance • Explain the clinical significance of different values of drug clearance • Describe the elimination of drug • Explain First & Zero Order Kinetics with their clinical significance • Explain differences between First-order kinetics and Zero Order Kinetics	IL	MCQ	C
Basic principles of Pharmacodynamics • Explain the term 'pharmacodynamics.' • Describe the general mechanisms by which drugs act • Describe drug-receptor interactions • Explain the terms affinity, efficacy, intrinsic activity & potency • Describe the different types of ligands • Explain difference between inverse agonist and pharmacological antagonist • Explain the effect of a partial agonist in presence and absence of a full agonist • Describe spare receptors • Describe antagonists and types of antagonism • Describe receptor-signaling mechanisms	IL	MCQ	C
Super-sensitivity & hypo-sensitivity (Up-regulation and down-regulation of receptors), Tolerance and Tachyphylaxis • Explain Tolerance & Tachyphylaxis with clinical examples • Explain difference between Pharmacokinetic and Pharmacodynamic Tolerance • Explain cross tolerance • Tabulate differences between Tolerance and Tachyphylaxis • Explain Receptor Downregulation and Up-regulation with clinical examples	SGD	MCQ	CP
Dose-Response Curves • Describe the Graded Dose-response curve • Describe the information that can be obtained from a Graded Dose-Response Curve • Explain the significance of the log-dose response curve • Explain Quantal Dose-Response Curve • Describe the information that can be obtained from a Quantal Dose-Response Curve • Tabulate differences between Graded and Quantal Dose-Response Curve • Explain Therapeutic Index and Therapeutic Window	IL	MCQ	C
Factors Affecting Dose and Action of a Drug • Enumerate the factors affecting the dose and action of a drug • State the formulae for calculating the dose of a drug according to age and weight • Explain Synergism, Summation and Potentiation • Explain drug interaction, contraindication, and drug accumulation	IL	MCQ	C
Pharmacogenetic • Define Pharmacogenetics • Explain the importance of the study of pharmacogenetics • Explain the term idiosyncrasy with examples • Explain examples of the difference in response to drugs due to genetic variation	IL	MCQ	C

Adverse Drug Reactions/ Drug-drug interactions • Define adverse drug reaction, adverse effect and side effect • Identify differences between adverse effect and side effect • Tabulate differences between Type A and Type B adverse reactions • Describe relationships between toxic & therapeutic effects of drugs • Describe different categories of drugs based on their teratogenic potential • Describe pharmacokinetic and pharmacodynamic drug-drug interactions	IL	MCQ	C
Introduction to Pharmacology Lab & dosage forms of drugs • To introduce pharmacology experiments and their role in the teaching of Pharmacology • To inform the students about the laboratory safety rules • To familiarize the students with various pharmaceutical dosage forms of drugs	Practical	OSPE	CPA
Calculations • To calculate of dose for age, body weight, body surface area • To calculate of dose from Stock-Solution	Practical	OSPE	CPA
Introduction to Pharmacy • To introduce pharmacy experiments and standard laboratory equipment • To introduce the metric system for measuring solid and liquid materials • To introduce solutions and define various types of solutions • To prepare and dispense normal saline and learn its indications • To prepare and dispense ORS powder and its indications	Practical	OSPE	CPA
Pharmacy experiments: Preparation of Normal Saline & ORS • Prepare and dispense 100 ml of Normal Saline. Give directions for its use in a dehydrated child weighing 10 Kg. • Prepare and dispense three ORS powders. Give directions for its use in a dehydrated	Practical	OSPE	CPA
Introduction to ANS (Cholinergic & Adrenergic Transmission) • Explain the term 'Autonomic Pharmacology.' • Describe brief anatomy of ANS • Describe the basic physiology of ANS • Enumerate Autonomic neurotransmitters • Enlist cholinergic & adrenergic fibers • Describe the synthesis, storage, release and breakdown of Acetylcholine • Name the drugs that block each step of Acetylcholine synthesis • Enlist cholinergic & adrenergic receptors • Describe steps in synaptic transmission • Tabulate differences in sympathetic & parasympathetic nervous system • Describe presynaptic & post-synaptic regulation • Describe auto receptors and heteroreceptors • Describe Enteric Nervous System & NANC Neurons	IL x 2	MCQ	C

Para sympathomimetics (direct & indirect) • Classify Para sympathomimetics • Describe actions of direct para sympathomimetics • Describe the actions of indirect para sympathomimetics • Describe uses of para sympathomimetics • Tabulate differences between neostigmine and physostigmine • Differentiate between Myasthenic crisis & cholinergic crisis • Describe the clinical features of organophosphorus compound (OPC) poisoning • Describe the symptomatic and pharmacological treatment of OPC poisoning • Explain the mechanism of action of oximes • Describe aging and its clinical significance	IL x 2	MCQ	C
Mushroom poisoning, Organophosphate poisoning, Myasthenia gravis, Alzheimer's disease • Enlist the symptoms of Mushroom poisoning, Organophosphate poisoning • Describe the drug treatment of Mushroom poisoning, Organophosphate poisoning • Correlate the drug treatment of myasthenia gravis with the mechanism of disease. • Correlate the drug treatment of Alzheimer disease with the mechanism of disease	SGD	MCQ	CPA
Anti-Muscarinic drugs • Classify Anti-Muscarinic drugs • Classify Anti-muscarinic drugs according to their therapeutic uses • Describe the mechanism of action of Anti-muscarinic drugs • Describe the pharmacological actions of anti-muscarinic drugs • Describe therapeutic uses of anti-muscarinic drugs • Describe adverse effects of anti-muscarinic drugs • Explain contraindications of Anti-muscarinic drugs • Describe atropine poisoning & its treatment	SGD	MCQ	CPA
Overdose toxicity of anticholinergic drugs & Datura poisoning • Describe the symptoms of overdose toxicity of anticholinergic drugs & Datura poisoning • Prescribe treatment of overdose toxicity of anticholinergic drugs & Datura poisoning	SGD	MCQ	CPA
Sympathomimetic drugs • Describe the synthesis, storage, release, breakdown & reuptake of catecholamines • Enlist the names of the drugs that block each step of catecholamine synthesis & reuptake • Describe the location and signaling mechanisms of adrenoreceptors • Classify Sympathomimetics • Describe pharmacological actions of Sympathomimetics • Explain the vasomotor reversal phenomena of Dale • Tabulate the differences in CVS actions of major groups of sympathomimetics • Describe clinical uses of Sympathomimetics • Enumerate adverse effects of sympathomimetics • Describe mechanism of action of indirectly Acting sympathomimetics • Describe uses and adverse effects of indirectly acting sympathomimetics	IL x 2 SGD	MCQ	C

Sympatholytic Alpha-Blockers • Classify Alpha Blockers • Describe actions of alpha-blockers • Explain why non-selective alpha-blockers cause more tachycardia than selective alpha-1 blockers • Describe uses of alpha-blockers • Enlist adverse effects of alpha-blockers	IL	MCQ	C
Sympatholytic Beta-Blockers • Classify Beta Blockers based upon Receptor Selectivity • Explain ISA and MSA • Classify Beta Blockers based upon ISA & MSA activity • Describe the actions of Beta Blockers • Explain uses of Beta Blockers • Describe adverse effects of beta-blockers • Enlist contraindications of beta-blockers • Explain the clinical significance of Beta-Blockers with ISA & MSA Activity • Explain the clinical significance of cardio-selective beta-blockers	IL SGD	MCQ	C
Adrenergic neuron blockers & drugs acting on ganglia • Enumerate adrenergic neuron blockers • Explain the mechanism of action of neuron blocking drugs • Enumerate as well as describe adverse effects of neuron blocking drugs • Enumerate ganglion blockers • Describe actions and adverse effects of ganglion blockers	IL SGD	MCQ	C
Glaucoma drugs • Enumerate different drug groups used in Glaucoma • Describe their role/mode of actions in reducing IOP in Glaucoma • Discuss drugs used in wide-angle and narrow-angle Glaucoma • Describe the management of acute narrow-angle Glaucoma • Enlist newer drugs used in the treatment of Glaucoma	IL SGD	MCQ	C
Rational prescribing and prescription writing • To learn how to plan for a right prescription • To know about the contents of a prescription • To learn the abbreviations used in prescription writing • To be aware of common errors of prescription writing • How to improve patient's compliance • Write some prescriptions for practice	Practical	OSPE	CPA
Effect of Miotics and Mydriatics on rabbit eye • To study the effect of topical application of pilocarpine and Tropicamide/phenylephrine on the eye to understand their mechanism of action and uses.	Practical	OSPE	CPA
Dose response-curve and competitive antagonism • To identify the effect of acetylcholine/carbachol (muscarinic agonist) on the contractile response of isolated rabbit's intestine and obtain a dose-response relationship • To study antagonism of acetylcholine/carbachol-induced contractions with atropine (competitive muscarinic antagonist)	Practical	OSPE	CPA
Clinical Pharmacology Seminar on Mushroom, Organophosphate, and Dhatura/Atropine Poisoning • To revise cholinergic and anticholinergic drugs and their toxicity from clinical problems (Case scenarios) by self-study and group discussions.	Practical	OSPE	CPA

Clinical Pharmacology Seminar on Myasthenia Gravis and Glaucoma • To learn the pathophysiology and management of Myasthenia gravis and Glaucoma.	Practical	OSPE	CPA
PATHOLOGY			
Cell injury • Describe the types of cellular adaptations and morphological changes that are seen in these types. • Explain the mechanism and types of cell injury. • Explain morphological changes are seen in reversible and irreversible cell injury. • Explain the mechanism of cell injury caused by free radicals. • Explain the features and types of necrosis. • Describe the pathogenesis of apoptosis with examples. • Describe the types of intracellular accumulation with examples. • Explain the types of pathological calcification with examples. **Practical:** • Identify the microscopic features of different types of cellular adaptations with examples. • Identify the microscopic features of different types of necrosis with examples. • Identify the microscopic features of intracellular accumulations/ pigments.	IL SGD Practical	MCQ VIVA OSPE	CPA

GENERAL BACTERIOLOGY • Describe the classification of important bacteria and their characteristic features. • Describe the bacterial cell structure and their functions. • List the differences between the cell wall of gram positive and gram-negative bacteria. • Discuss the phases of bacterial growth curve. • Describe the processes involved in bacterial gene transfer. • Discuss different methods used for sterilization and disinfection. • Discuss the infection control measures in healthcare settings. • List the members of normal flora and their anatomic locations. • Describe the medical implications of the normal flora. • Describe different mechanisms of pathogenesis of bacteria. • Discuss the general approach to the diagnosis of bacterial infection. • Describe different types of bacterial vaccines and their administration schedule. • Explain the mechanism of action and resistance pattern of different antimicrobial drugs. **PRACTICALS** • Describe the different methods and requirement of sample collection and transport to the Pathology laboratory. • Understand the various infection control measures. • Understand the working principle, procedure and interpretation of Gram staining. • Identify different bacteria based on their morphology and staining reaction. • Understand different methods of preparation and inoculation of culture media. • Identify the different types of culture media like blood agar, MacConkey agar, Nutrient agar, blood culture bottle, Chocolate agar, LJ medium, Saboraud agar, CLED agar. • Understand the working principle and interpretation of different biochemical tests. • Identify Autoclave and Hot air oven used for sterilization**.**	IL SGD Practical	MCQ VIVA OSPE	CPA
COMMUNITY DENTISTRY			
The science, philosophy and ethics of dental public health **Concept of Dental Public Health** • Define health, public health and dental public health • Interpret the role of public health in the upstream-downstream phenomenon. • Describe Aims & tools of DPH • Interpret the iceberg phenomenon • Review the top 10 achievements of public health in 20th century	IL SGD	MCQ OSPE Log Book	CP
Core functions of Public Health • Review the impact of oral disease and their public health importance • Identify core functions and essential health services of public health • Based on above, discuss functions and services of dental public health • Summarize the planning steps of a dental public health program • Distinguishing the criteria of a DPH problem. What is a public health problem?	IL SGD	MCQ OSPE Log Book	CP

Role of a public health dentist • Compare and contrast the steps of planning a dental public health intervention to the clinical steps of a dental treatment • Discuss the Components of a dental public health structure and role of a public health dentist • Discuss the differences between a clinical dentist and a public health dentist • Review the dental public health infrastructure in Pakistan	IL SGD	MCQ OSPE	CP
Ethics in Public health dentistry • Discuss the Key principles of ethics for a dental practitioner • Review conduct, duties & ethical obligations of dentists towards peers and patients • Distinguish between ethical and unethical practices • Implementing of ethics when dealing with vulnerable populations	IL SGD	MCQ OSPE Log Book	CP
Concepts of health, illness, disease and preventive approaches **Health, illness, and disease** • Review the Dimensions of health • Summarize the theories of disease causation • Differentiate between illness, &disease • Interpret the stages of illness & disease • Computation of Epidemiological Triad	IL SGD	MCQ OSPE Log Book	CP
Preventive Health Strategies • Differentiate between the different levels of prevention • Differentiate between the different approaches to prevention • Discuss advantages & disadvantages of each approach	IL SGD	MCQ OSPE Log Book	CP
Global health organizations and their role in global public health **Global Public Health** • Review the key concepts of Global health • Discuss the evolution of global health from the 19th century to date • Review the world health agencies mainly the UN, WHO, Multilateral, Bilateral agencies and INGOs • Review of MDGs and SDGs	IL SGD	MCQ OSPE Log Book	CP
DENTAL MATERIALS			

Introduction & classification of Dental biomaterials **Properties of dental biomaterials and their biocompatibility** **Mechanical Properties** • Types of Stress (compressive, Tensile &Shear) • Stress Strain Curve • Proportional Limit, Elastic Limit, Elastic Modulus, Resilience, Toughness, Fracture Toughness, Yield Strength, Ultimate Strength, Brittleness, Ductility & Malleability • Stress Concentration • Viscoelasticity • Surface Mechanical Properties • Hardness **Thermal Properties** • Thermal Conductivity, Thermal Diffusivity, Specific Heat, Heat of Fusion, Coefficient of thermal expansion **Optical Properties** • Hue, value, chroma, metamerism Rheological Properties • Viscosity & Flow, Newtonian Fluids, Thixotropy, Pseudoplasticity, Dilatant, Creep **Electrical Properties** • Electrical Conductivity & resistivity, Electrochemical Corrosion, Galvanism Tarnish and Discoloration • Surface Tension & Wetting Water Sorption • Working & Setting time • Shelf life	IL SGD	MCQ	CP

Impression materials Classify impression materials based on ➢ Mechanical Properties ➢ Viscosity ➢ Setting Reaction Discuss the composition, setting reaction, properties and clinical applications of Non-elastic Impression Materials ➢ Impression Compound, ➢ Impression Plaster, ➢ Zinc-Oxide Eugenol Paste, ➢ Impression Waxes Discuss the composition, setting reaction, properties and clinical applications of Elastic Impression Materials ➢ Reversible & Irreversible Hydrocolloids ➢ Non-aqueous Elastomers o Polysulfide o Polyether o Addition Silicon o Condensation Silicon Describe and discuss the different types of Impression Trays Discuss the disinfection of Impression materials. **Laboratory skills** Handling and manipulation of impression compound, ZnO-eugenol paste, alginate and addition silicon (light body and putty type)	IL SGD Practical	MCQ OSPE OSPE	CPA
JUNIOR PROSTHODONTICS			
• Kennedy's Classification • Applegate's rules • Identification of Kennedy's class	IL	MCQ OSPE	CP
• Primary impression and fabrication of cast • Recording an impression • Pouring of impression • Fabrication of cast	IL Practical	OSPE	P
JUNIOR OPERATIVES			
GV black classification: • Define and explain the differences between different classes of cavities	IL	MCQ OSPE	C
• Principles of tooth cavity preparation: • General form of cavity preparation: • Outline form • Convenience form • Resistance form • Retention form	IL Practical	MCQ OSPE	CP

MODULE 8:

Learning Objectives	MIT	AT	Cognitive Domain
Introduction to Chemotherapy • Classify anti-microbials. • Explain bacteriostatic and bactericidal. • Describe combination therapy. • Define and explain MIC. • Describe empirical therapy, its advantages, and disadvantages. • Describe the mechanism of resistance. • Explain cross-resistance.	IL	MCQ	C
Cancer Chemotherapy • Classify anti-cancer drugs • Explain cell-specific cycle and non-specific cell cycle • Describe problems with anti-cancer treatment • Describe the most adverse effects common to most anti-cancer drugs • Give mechanism of action of alkylating agents • Give mechanism of action of cyclophosphamide, nitrosourea and procarbazine • Give mechanism of action of Platinum analogs • Enumerate uses and adverse effects of alkylating agents • Enumerate uses and adverse effects of cyclophosphamide • Give mechanism of action of anti-metabolites and methotrexate in cancer • Enumerate purine and pyrimidine antagonists in cancer • Describe the mechanism of action of Vinca alkaloids • Give uses and adverse effects of Vinca alkaloids • Describe the mechanism of anti-cancer antibiotics • Enumerate uses and adverse effects of anti-cancer antibiotics • Enumerate anthracycline antibiotics • Give uses and adverse effects of anthracycline antibiotics • Give anti-cancer uses and adverse effects of tamoxifen and flutamide • Summarize uses and adverse effects of aromatase. • Identification of drug formulations for related drugs.	ILx2 SGD Practical	MCQ VIVA OSPE	CP

Cell Wall Synthesis Inhibitors (Beta-Lactam and Non-Beta-Lactam) • Enumerate cell wall synthesis inhibitors. • Explain beta-lactam antibiotics. • Enumerate beta lactam antibiotics. • Classify penicillin. • Enumerate reverse spectrum penicillin. • Explain the mechanism of action of Penicillin & other beta-lactam antibiotics. • Give antibacterial spectrum of penicillin. • Enumerate beta-lactam inhibitors. • Enumerate adverse effects of Penicillin • Describe the mode of action and therapeutic indications of Vancomycin. • Describe the adverse effects and contraindications of Vancomycin. • Describe the other non-beta-lactam antibiotic and their adverse effects. Enumerate monobactams. • Give spectrum of monobactams. • Enumerate uses of monobactams. • Enumerate adverse effects of monobactams. • Enumerate carbapenems. • Give spectrum of carbapenems. • Enumerate uses and adverse effects of carbapenems. • Enumerate uses and adverse effects of Fosfomycin. • Classify cephalosporins • Give antibacterial spectrum of different generations of cephalosporins • Enumerate uses of different generations of cephalosporins • Enumerate and describe adverse effects of cephalosporins. • Identification of drug formulations for related drugs	IL x 3 SGD Practical	MCQ VIVA OSPE	CP
Protein Synthesis Inhibitors Tetracyclines, Chloramphenicol & Aminoglycosides • Classify tetracyclines • Describe special factors affecting oral absorption of tetracyclines • Give spectrum of tetracyclines • Enumerate uses and adverse effects of tetracyclines • Enumerate contraindications of tetracyclines • Classify aminoglycosides • Give mechanism of action of aminoglycosides • Enumerate aminoglycosides which are more nephrotoxic • Enumerate ototoxic aminoglycosides • Give contraindications and drug interactions of aminoglycosides • Describe the mechanism of action, uses, and adverse effects of spectinomycin	IL x 2 SGD	MCQ VIVA OSPE	CP

Sulfonamides, Fluoroquinolones • Classify sulfonamides • Describe the mechanism of action of sulfonamides • Give spectrum uses and adverse effects of sulfonamides • Give drug interaction of sulfonamides • Classify quinolones • Give mechanism of action of fluoroquinolones • Give spectrum of different fluoroquinolones • Enumerate adverse effects of fluoroquinolones • Give drug interactions and contraindications of Fluoroquinolones.	IL x 2 SGD	MCQ VIVA OSPE	C
Antifungal drugs & Antiviral agents • Classify antifungals • Enumerate topical antifungals • Describe the mechanism of action and therapeutic indications of amphotericin-B and Nystatin. • Describe the adverse effects and contraindications of amphotericin-B and Nystatin. • Describe the mechanism of action and therapeutic indications of azoles antifungal drugs. • Describe the adverse effects and contraindications of azoles antifungal drugs. • Enumerate adverse effects of Griseofulvin and describe its therapeutic indications. • Classify antiviral agents • Elaborate mechanism of action and a therapeutic indication of acyclovir. • Describe the adverse effects and contraindications of acyclovir. • Give mechanism of action and a therapeutic indication of interferons (IFNs). • Describe the adverse effects and contraindications of interferons (IFNs). • Enlist the other drugs used in hepatitis viral infection. • Give the names of agents that block viral penetration/un-coating and their adverse effects. • Classify antivirals used for AIDS • Describe the mode of action and adverse effects of zidovudine. • Identification of drug formulations for related drugs.	IL x 3 SGD	MCQ VIVA OSPE	CP
PATHOLOGY			

INFLAMMATION • Define acute Inflammation. • Describe the mediators involved in the process of acute Inflammation. • Describe the cardinal signs of inflammation. • Describe the vascular reaction/events of acute inflammation. • Describe the Cellular events of acute inflammation/ steps of cellular response of leukocytes in acute inflammation. • Discuss the outcomes of acute inflammation. • Explain the functions of the macrophage in acute inflammation. • Define chronic inflammation. • Describe the main causes and constituents of chronic inflammation. • Define Granulomatous Inflammation. • Explain the mechanism of granuloma formation. • Explain the overview of cell cycle and types of tissue cell with respect to proliferative activity. • Discuss types of tissue repair, process of regeneration and scarring. • Describe factors affecting healing and complications of healing. **PRACTICAL**: • Identify the microscopic features of acute inflammation based on case scenarios • Identify the microscopic features of chronic inflammation based on case scenarios	IL SGD Practical	MCQ OSPE VIVA	CP
GENERAL VIROLOGY • Classify the medically important viruses. • List medically important DNA and RNA viruses. • Differentiate between bacteria and viruses. • Discuss the structure of virus. • Describe the replication of viruses. • Describe Host defense and pathogenesis of viral infections. • Discuss Lab diagnosis of viral diseases. • Discuss mechanism of action of Antiviral drugs.	IL SGD	MCQ OSPE VIVA	CP
GENERAL MYCOLOGY • Differentiate between bacteria and fungi. • Discuss general aspects of Mycology including their characteristics and pathogenesis. • Classify fungi on the basis of morphology and site/ location of body where they cause disease. • Discuss the various approaches to diagnose fungal infections. • Discuss Antifungal therapy	IL SGD Practical	MCQ OSPE	CP

GENERAL PARASITOLOGY • Discuss the general features of parasites and differences from other microorganisms. • Define various terms related to Parasitology (Types of parasitic hosts • Types of parasitic life cycles • Sources of infection • Modes of transmission) • Discuss classification of parasites. • List medically important protozoa. **PRACTICALS:** • Understand the working principle and interpret different diagnostic test used for viral infections. • Understand the working principle and interpret different diagnostic test used for fungal infections. • Understand the working principle and interpret different diagnostic test used for parasitic infections.	IL Practical	OSPE	CP
COMMUNITY DENTISTRY			
The science and application of dental caries and oral hygiene indices **Introduction to Dental Indices** • Describe the properties of an ideal index. • Identify the purposes & uses of indices. • List the Indices used in DPH • Demonstrate the process of screening & application of an oral health index **Oral Hygiene Indices** • Review the indices used to evaluate oral hygiene of individual patients and of populations • Apply, compute and interpret the Oral Hygiene Index (OHI) and Oral Hygiene Index – Simplified (OHI-S) • Apply, compute and interpret the Plaque Index PI	IL SGD Fieldwork IL SGD PBL Practical Clinics	MCQ OSPE Logbook	C P
Dental Caries Indices • Review the indices used to evaluate caries in individual patients and of populations • Apply, compute and interpret the DMFT, DMFS, deft, and deft indices • Interpret the WHO Index for Dental caries	IL SGD PBL Practical Field work Clinics	MCQ OSPE Logbook	CP
The science and application of periodontal and fluorosis indices and WHO oral health assessment tools **Fluorosis Indices** • Indices used for evaluating fluorosis • Compute the components of Deans fluorosis index and calculate fluorosis score • Interpret the Dean's Index score	IL SGD Practical	MCQ OSPE Logbook	CP

Indices for evaluating periodontal health. • Determine the type of index. • Review indices used to evaluate periodontal health in individual patients and Review factors of periodontal health that in populations • Execute, compute and interpret the Gingival Index • Review the different types of periodontal probes • Differentiate between clinical and epidemiological CPITN probes • Execute, compute and interpret the CPITN index	IL SGD Practical Clinics	MCQ OSPE Logbook	CP
WHO Oral Health surveys • WHO oral health habits form for adults • WHO Oral health clinical assessment form for adults	SGD SDL Field work	MCQ OSPE Logbook	PA
Framework of Pakistan's health-care system and the dental workforce **Structure of dental services** • Describe the structure of a dental office • Identify and summarize the role of dental Auxiliaries • Demonstrate four-handed dentistry • Compare and contrast different types of dental practices	IL SGD SDL	MCQ OSPE	CP
Dental Practice Management • summarize key principles of dental practice • Review the steps of establishing the dental practice • Explain the ten fundamentals of dental practice management	IL SGD SDL	MCQ	C
Pakistan Health Care System • Review Pakistan's Country profile and burden of oral disease. • Summarize the outline of an ideal country health care system. • Describe Pakistan's healthcare system. • Classify the Health Workforce of Pakistan	IL SGD SDL	MCQ	C
Burden of Oral Disease in Pakistan • Classify Vertical health program in Pakistan • Discuss the process and outcomes of the devolution of Pakistan's healthcare infrastructure.	SGD SDL	MCQ	C
DENTAL MATERIALS			

Structure & Properties of metals and alloys • Discuss the atomic Structure of metals and alloys Describe the physical Properties of metals and alloys • Discuss the concepts of hardening and shaping mechanism of metals & alloys • Discuss ➢ Solid solution ➢ Eutectic alloys ➢ Intermetallic alloys ➢ Age hardening ➢ Grain Refining ➢ Annealing, Tempering	IL SGD	MCQ	C
Wrought Alloys Describe and discuss the microstructure, composition, properties and clinical applications of wrought alloys ➢ Wrought Stainless steel alloys ➢ Wrought Cobalt chromium alloys ➢ Wrought Beta-titanium	IL SGD	MCQ	C
Gypsum Products • Classify Gypsum products. • Describe and discuss different theories of setting of gypsum. • Discuss the microstructure of dental plaster and dental stone. • Discuss the water/powder ratio of different gypsum products. • Explain how to measure setting time and discuss the factors effecting the working & setting time, strength and setting expansion of gypsum products ➢ Effect of Spatulation ➢ Effect of Temperature ➢ Effect of Humidity ➢ Effect of colloidal systems and pH ➢ Effect of W/P ratio ➢ Effect of addition of Accelerator and Retarders **Laboratory skills** • Manipulation of Dental Plaster and dental stone • Making of Plaster slab • Pouring of dental plaster and stone into rubber molds	IL SGD Practical	MCQ OSPE	C P
JUNIOR PROSTHODONTICS			
Manipulation of Impression Materials Gypsum Materials	IL Practical	MCQ OSPE	CP
JUNIOR OPERATIVES			

Class 1 cavity preparation on plaster models -All forms of class 1 cavity and materials used for restoration -Class 1 compound cavity preparation -Define compound cavity -Forms of compound cavity **Class 1 cavity preparation on typodont** -Explaining all forms of cavity -Materials used for restoration of class1 cavity	IL Practical	MCQ OSPE	CP

LEARNING RESOURCES/RECOMMENDED BOOKS:

Pharmacology:

1. Basic & Clinical Pharmacology by Katzung 14th Edition.
2. Rang and Dale Pharmacology 8th Edition.
3. Basis of Pharmacology by Goodman & Gillman Latest Edition.
4. Bentley's Textbook of Pharmaceutics by Jain 2012 An adaption.
5. Medical Pharmacology & Therapeutics by Walker 3rd Edition,
6. Netter's illustrated Pharmacology by RAFFA latest Edition.

Pathology:

1. Robbins and Cortan Pathologic basis of disease 10th Edition
2. Basic Pathology by Kumar and Cotran 10th Edition
3. Medical Microbiology and Immunology by Warren Levinson 14th Edition

Dental Materials:

1. Phillips' Science of Dental Materials by Anusavice, Shen, Rawls 12th edition
2. Applied Dental Materials by McCabe and Walls 9th edition
3. Craig's Restorative Dental Materials by Sakaguchi, Powers 13th edition

Community Dentistry:

1. Essentials of Preventive and Community Dentistry by Soben Peter 4th edition
2. Textbook of Preventive and Community Dentistry by S S. Hiremath 2nd edition
3. Textbook of Preventive and Community Dentistry by Joseph John 3rd edition

Prosthodontics:

1. McCracken's Removable Partial Prosthodontics by Alan B. Carr and David T. Brown
2. Prosthodontic Treatment for Edentulous Patients by George Albert Zarb

Operative Dentistry:

1. Sturdevant's art and Science
2. Evans Atlas

Behavioral Sciences:

1. Introduction to Psychology by Edward. E Smith.
2. Behavioral Science by Lippincott William

FOR ENQUIRIES CONTACT:
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