



Study Guide Block-I



BDS Year-1

BLOCK: I**Academic Year: 2026-27****Duration: 10 Weeks****DISCLAIMER**

- Developing a study guide is a dynamic process and undergoes iteration according to the needs and priorities.
- This study guide is subjected to the change and modification over the whole academic year.
- However, students are advised to use it as a guide for respective modules.
- It is to declare that the learning objectives (general and specific) and the distribution of assessment tools (both theory and practical) are obtained from M. Islam Dental College Gujranwala. These can be obtained from: <https://www.uhs.edu.pk/>
- The time tables are for guiding purpose. It is to advise that final timetables are always displayed over the notice boards of each lecture hall.
- Students are encouraged to provide feedback via module coordinator.

Vision of UHS

“UHS is a leading University aiming to keep its graduates apt with the ever-emerging global health challenges, evolving educational methodologies, and emerging technological advancements to maintain its distinguishable position as a Medical University.”

Mission of MIDC

To emerge as a globally acclaimed institute that prepares compassionate, knowledgeable & skilled dental professionals excelling in innovative research, patient care & community service

Program Outcomes:

At the end of the BDS program, the dental graduate should be able to:

1. **Clinical Competence:** Graduates will demonstrate essential clinical skills, knowledge, and attitude to provide safe, effective, and ethical dental care to diverse populations.
 2. **Community-Oriented Care:** Students will develop a commitment to serving underserved communities, understanding the specific oral health challenges faced by Pakistan’s population, and contributing to public health initiatives.
 3. **Ethical and Professional Conduct:** Graduates will uphold high standards of ethical practice, showing respect, empathy, and accountability in all patient and professional interactions.
 4. **Lifelong Learning:** Graduates will embrace lifelong learning, continually updating their skills and knowledge to keep pace with advances in dental science and technology.
 5. **Leadership and Collaboration:** Students will be prepared to take on leadership roles within healthcare teams, collaborating effectively with other professionals to enhance patient care.
 6. **Research and Innovation:** Graduates will engage in or support research and innovation in dental science, contributing to evidence-based practices that advance oral health in Pakistan.
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MODULE COMMITTEE

Sr. No.	Name	Department & Designation	Role
1.	Prof. Dr. Rana Modassir	Principal	Curriculum Director
2.	Prof. Dr. M. Saif Ullah	HOD, DME	Assistant curriculum Director
3.	Prof. Dr Raheela	Assoc. Professor Oral Biology	Coordinator Block-I
4.	Dr. Shahid Saeed	Professor Physiology	Coordinator Block-II
5.	Dr. Shahid Saeed	Professor Physiology Dentistry	Coordinator Block-III
Module Team			
6.	Dr. Shahid Saeed	Professor Physiology	Member
7.	Dr Saveela Sadaqat	AP Biochemistry	Member
8.	Dr. Uzma Riaz	Professor Pharmacology	Member
9.	Dr Shmasa Mohsin	Professor Anatomy	Member
10.	Dr. Rabia Asad	Professor Community Dentistry	Member
11.	Dr Shamsa Mohsin	Professor Anatomy	Member
12.	Dr. Zahid	Professor Microbiology	Member
13.	Dr. Sobia Siddique	Professor Oral Pathology	Member
14.	Dr Ahmed Mehmood	Associate Professor Behavioral Science	Member
15.	Dr. Rabeet Asif	DME	Proof reading & Editing
16.	Dr. Nivish	DME	Developer Block-I

INTRODUCTION TO STUDY GUIDE

It is an aid to Inform students how student learning program of the module has been organized, to help students organize and manage their studies throughout the module and guide students on assessment methods, rules and regulations.

The Study Guide:

1. Communicates information on organization and management of the module.
2. This will help the student to contact the right person in case of any difficulty.
3. Defines the objectives which are expected to be achieved at the end of the module.
4. Identifies the learning strategies such as lectures, small group teachings.

Module Outcomes:

5. Provides a list of learning resources such as books, computer-assisted learning programs, web links, and journals, for students to consult in order to maximize their learning.
6. Highlights information on the contribution of continuous on the student's overall performance.
7. Includes information on the assessment methods that will be held to determine every student's performance.

Achievement of Objectives:

Focuses on information pertaining to examination policy, rules and regulations

Students will experience an integrated curriculum.

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.

TEACHING AND LEARNING STRATEGIES

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

1. Interactive Lectures
2. Small Group Discussion
3. Practical
4. Skills session in skill labs
5. Case-Based Learning (tutorials)
6. Directed Self-Learning

- **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.

- **Small group discussion (SGD):**

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.

- **Skills session:**

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

- **Case Based Learning (CBL):**

A small group discussion format where learning is focused on a series of questions based on a clinical scenario. Students discuss and answer the questions by applying relevant knowledge gained previously in clinical and basic health sciences during the module and construct new knowledge. The CBD will be provided by the concerned department. It is an active learning & teaching strategy which promotes application of foundational knowledge in relevant clinical scenarios.

- **Directed Self-learning (DSL):**

Directed Self-learning, which involves studying with indirect supervision in a classroom/Library, 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.

BLOCK-I

Sr. No.	MODULES	WEEKS
1-	Foundation-I	4
2-	Craniofacial-I	3
3-	Cariology-I	3
	Total	10 Weeks

Foundation-I

Specific Learning Objectives:

ANATOMY				
GROSS ANATOMY				
TOPIC	Specific Learning objectives	Teaching strategy	Levels C/P/A	Assessment
Introduction to Human Anatomy: Definitions, Terminology, and Planes	Define different branches of Anatomy	SGD (Dissection Hall & Museum)	C2	MCQs, OSVE, OSPE
	Describe the "Anatomical Position"		C2	
	Discuss the planes of body		C2	
	Describe the terms related to position, movement and laterality		C2	
Osteology	Discuss the structural characteristics of compact and spongy bones	SGD (Dissection Hall & Museum)	C2	MCQs, OSVE, OSPE
	Classify bones based on region, size and shape providing examples of each, preferably from the head and neck		C2	
	Describe the general characteristics of an adult typical long bone		C2	
	Define ossification and briefly describe the process of intramembranous and endochondral ossification	SGD (Dissection Hall & Museum)	C2	
	Describe rule of ossification		C2	
	Describe the blood supply of various types of bones			
	Describe the features of different views of skull (Anterior, Posterior, Superior, Inferior, Lateral)		C3	
Joints	Describe the structural classification of Joints (fibrous, cartilaginous and synovial) along with their sub-	SGD (Dissection Hall &	C2	MCQs, OSVE, OSPE

	classifications with examples of each	Museum)		
	Enlist the general characteristics of synovial joints		C1	
	Enlist the factors stabilizing a synovial joint		C2	
	Describe Hilton’s Law		C2	
Cartilage	Discuss and differentiate the gross features of hyaline, elastic and fibrocartilage	SGD (Dissection Hall & Museum)	C2	MCQs, OSVE, OSPE
Myology	Describe the types of muscular tissue (skeletal, smooth and cardiac)	SGD (Dissection Hall & Museum)	C2	MCQs, OSVE, OSPE
	Describe parts of a muscle		C2	
	Classify and exemplify skeletal muscles on the basis of shape, fiber architecture and action		C3	
Integumentary system	Describe the two layers of skin (epidermis and dermis)	SGD (Dissection Hall & Museum)	C2	MCQs, OSVE, OSPE

HISTOLOGY

Topic	Specific Learning objectives	Teaching strategy	Levels C/P/A	Assessment
Cell	Describe the electron microscopic structure and fluid mosaic model of plasma membrane	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	List the membranous and non-membranous cellular organelles of cell	LGIS (Lecture Hall 1)	C1	
	Describe the structure of the cellular organelles and correlate with their functions		C2	

	Describe the structure of different types of cell junctions	LGIS (Lecture Hall 1)	C2	
	Briefly describe the structure of nucleus	LGIS (Lecture Hall 1)	C2	
Epithelium	Classify and exemplify the epithelia with their histological structure, locations, and functions	LGIS (Lecture Hall 1)	C3	MCQs, OSVE, OSPE
	Draw and label light microscopic diagram of different types of epithelia	Particle (Lab)	C3	
	Describe the electron microscopic structure & functions of the following apical cell surface specializations: i. Microvilli ii. Stereocilia iii. Cilia	LGIS (Lecture Hall 1)	C2	
	Describe the structure of basement membrane		C2	
	Classify and exemplify the exocrine glands on the basis of: Shape of secretory portions and ducts mode of secretion and types of secretion and shape of secretory portions and ducts	LGIS (Lecture Hall 1)	C2	
Connective Tissue	List the connective tissue cells along with their functions	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Describe the composition of ground substance of connective tissue		C2	
	Describe the structure of fibers of connective tissue	LGIS (Lecture Hall 1)	C2	
	Classify connective tissue along with their examples	LGIS (Lecture Hall 1)	C2	
	Draw and label light microscopic diagram of different types of connective	Practical (Lab)	C2	

	tissue			
Cartilages	Describe the microscopic and ultramicroscopic structure of all types of cartilages	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Draw and label light microscopic diagram of different types of cartilages	Practical (Lab)	C2	
Bones	List the bone cells along with their functions	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Describe the composition of bone matrix (organic, inorganic)	Hall 1)	C2	
	Describe the histology of compact and spongy bone	LGIS (Lecture Hall 1)	C2	
	Draw and label light microscopic diagram of compact and spongy bones	Practical (Lab)	C3	
Muscles	Describe the microscopic structure and ultramicroscopic structure of skeletal, cardiac, and smooth muscles	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Lymphoid System	Draw and label light microscopic diagram of muscles	Practical (Lab)	C2	MCQs, OSVE, OSPE
	Describe the light microscopic structure of lymphoid organs	LGIS (Lecture Hall 1)	C2	
	Draw and label light microscopic diagram of lymphoid organs	Practical (Lab)	C2	
Skin	Describe the composition of epidermis and dermis	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Draw and label light microscopic diagram of thick and thin skin	Practical (Lab)	C2	
PHYSIOLOGY				
Topic	Specific Learning objectives	Teaching strategy	Levels C/P/A	Assessment
	Define Homeostasis	LGIS	C2	MCQs, OSVE,

	Describe internal environment of the body	(Lecture Hall 1)	C2	OSPE
	Differentiate between Extracellular and Intracellular Fluids (with special emphasis on comparing the concentration of sodium, potassium, and calcium ions)	LGIS (Lecture Hall 1)	C2	
Control systems of the Body	Name control system of body by giving examples	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Explain the positive, negative, and feed-forward mechanisms with examples		C2	
Cell and its Organelles and their Functions	Discuss organization of the cell	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain the structure and functions of the cell membrane		C2	
	Enlist the functions of Glycocalyx		C1	
	Name different proteins of the cell membrane with their functions		C1	
	Enlist membranous and non-membranous organelles	LGIS (Lecture Hall 1)	C1	
	Enlist the self-replicative organelles		C1	
	Differentiate between the functions of smooth and rough endoplasmic reticulum	LGIS (Lecture Hall 1)	C2	
	Explain the functions of Golgi apparatus		C2	
	Explain the functions of lysosomes		C2	
	Explain the functions of peroxisomes		C2	
	Compare functions of lysosomes and peroxisomes		C3	
	Enlist functions of mitochondria and ribosomes		C1	
	Enumerate the components and functions of the cytoskeleton		SGD (Tutorial Room)	
Functional Systems of Cell	Define and enlist types of endocytosis	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain the mechanism of pinocytosis		C2	
Transport of Substance	Enlist different transport mechanisms	LGIS (Lecture	C1	MCQs, OSVE, OSPE

through Cell Membrane		Hall 1)		
	Discuss the process of simple diffusion across the cell membrane	LGIS (Lecture Hall 1)	C2	
	Explain the process of facilitated diffusion	SGD (Tutorial Room)	C2	
	Compare features of simple and facilitated diffusion with examples		C3	
	Classify different types of active transport	LGIS (Lecture Hall 1)	C1	
	Describe primary and secondary active transport with examples		C2	
	Enlist and explain functions of Na-K pump		C2	
Blood with Special Emphasis on Red Blood Cells, Anemia and Polycythemia	Discuss the components of blood	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Enlist the functions of blood		C1	
	Enlist plasma proteins		C1	
	Enumerate the different sites of erythropoiesis at different ages	LGIS (Lecture Hall 1)	C1	
	Enlist the stages of erythropoiesis		C1	
	Discuss characteristics of red cells		C2	
	Give normal range of red cells in blood, also their shape and size		C2	
	Define blood indices mentioned as: MCV (mean corpuscular volume), MCH (mean corpuscular hemoglobin), and MCHC (mean corpuscular hemoglobin concentration). Give their normal values & enumerate the conditions in which these values are disturbed		C2	
	Discuss functions of red cells		C2	
	Discuss the site and mechanism of production of erythropoietin and its role	LGIS (Lecture	C2	

	in erythropoiesis	Hall 1)		
	Explain the significance of vitamin B12 and folic acid in maturation of red blood cells		C2	
	Enumerate and elaborate role of factors/nutrients that are required and regulate erythropoiesis		C2	
	Discuss components/structure of hemoglobin	LGIS (Lecture Hall 1)	C2	
	Define sickle cell anemia		C2	
	Discuss fate of red cells when they complete their life span		C2	
	Define and classify anemia on the basis of morphology and cause	SGD (Tutorial Room)	C2	
	Discuss its effects on circulation		C2	
	Define and enlist types of polycythemias	LGIS (Lecture Hall 1)	C2	

BIOCHEMISTRY

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Carbohydrate	Define carbohydrates and their general structure.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Classify carbohydrates into monosaccharides, disaccharides, oligosaccharides, and polysaccharides and their biochemical importance		C3	
	Define carbohydrate isomerism, differentiate between aldo-keto isomers, D & L isomers, epimers, and α & β anomers, and provide suitable examples of each relevant to dentistry (dental caries, salivary glycoproteins)		C2	

	Differentiate between reducing and non-reducing sugars.		C2	
	Define blood glucose levels and identify the normal ranges for fasting, random, and postprandial blood glucose measurements.	LGIS (Lecture Hall 1)	C2	
	Define glycemic index and evaluate the impact of various dietary carbohydrates on blood sugar levels, highlighting their clinical significance.		C2	
Amino Acid & Protein Classification with Importance	Define amino acids and classify standard amino acids according to side chain and nutritional importance	LGIS (Lecture Hall 1)	C3	MCQs, OSVE, OSPE
	Define and classify proteins and their biological significance	LGIS (Lecture Hall 1)	C3	
	Explain the levels of protein organization (primary, secondary, tertiary, and quaternary structures) and their relevance to protein function.	LGIS (Lecture Hall 1)	C2	
Lipids	Define lipids and their Classification along with their biological importance	SGD (Tutorial Room)	C2	MCQs, OSVE, OSPE
Vitamins	Define vitamins and their biological role.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Classify the vitamins on the basis of solubility with their sources, active form, biological role, RDA and their disorders		C2	
Acid, Base, pH & Buffers	Define acids, bases, and pH in biological systems.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain the concept of pH scale and its importance in body fluids.		C2	
	Enlist the buffer systems of the human body and their role in maintenance of homeostasis.	LGIS (Lecture Hall 1)	C2	

	Describe the Henderson-Hasselbalch equation and its applications.	LGIS (Lecture Hall 1)	C2	
Enzymes	Define enzymes and their role in biological reactions.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Classify enzymes with examples of each	Hall 1)	C2	
	Explain the properties and mechanism of enzyme	LGIS (Lecture Hall 1)	C2	
	Describe the factors affecting enzyme activity and regulation of enzyme	SGD (Tutorial Room)	C2	
Cell	Describe the fluid mosaic model of cell membrane	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Describe the role of cell organelles with respect to their biochemical processes including their marker enzymes	LGIS (Lecture Hall 1)	C2	
Signal Transduction Pathway	Define and classify receptors.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Delineate the sequence of events in the signal transduction pathways involving Gs and Gq proteins.	LGIS (Lecture Hall 1)	C3	
Cell Energy Metabolism	Differentiate between anabolism and catabolism, and list the metabolic pathways associated with each process.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Outline the steps of glycolysis pathway including regulation of key enzymes with energetics	SGD (Tutorial Room)	C3	
	Differentiate between aerobic and anaerobic glycolysis, highlighting the fate of pyruvate in each condition.		C2	
Hemoglobin	Describe the structure of Heme and	LGIS	C3	MCQs,

Structure, Types, and Functions	briefly describe the steps of Heme synthesis with its regulation.			OSVE, OSPE
	How does Heme combine with Globin to form Hemoglobin and Enlist the functions of Hemoglobin	LGIS (Lecture Hall 1)	C3	
	Enlist the types of hemoglobin along with their percentage and chain composition.		C2	
	Explain the significance of HbA1c		C2	
	Define and explain the biochemical basis of porphyria along with its classification.	LGIS (Lecture Hall 1)	C2	
	Describe the oral and dental manifestations of porphyria, including erythrodontia, photosensitivity, mucosal lesions, and delayed healing.		C2	
Metabolic Pathways in Red Blood Cells	Explain the significance of anaerobic glycolysis in RBCs.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Define and explain the Rapoport-Luebering cycle as a glycolytic bypass in RBCs, highlighting 2,3-BPG production and its role		C2	
	Describe and outline the steps in Hexose Monophosphate Pathway (HMP) and its significance in RBC's	LGIS (Lecture Hall 1)	C3	
	Compare and contrast Glycolysis and the HMP Shunt		C3	
	Explain hemolytic anemia due to pyruvate kinase and glucose 6 phosphate dehydrogenase deficiencies.	LGIS (Lecture Hall 1)	C2	
Oxygen Dissociation	SGD (Tutorial Room)	C2	MCQs, OSVE, OSPE	

Curve	allosteric regulation.			
	Explain and draw the oxygen-hemoglobin dissociation curve for hemoglobin.	LGIS (Lecture Hall 1)	C2	
	Give biochemical explanation for abnormally high oxygen affinity of hemoglobin in the stored blood.		C3	
Biochemical Role of Selenium, Iron in RBC function	Describe the biochemical role of Selenium and Iron in RBC function, antioxidant defense, and erythropoiesis.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE

ORAL BIOLOGY				
Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Structure of Oral Tissues (An Brief Introduction)	The Tooth	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Supporting Tissues of the Tooth		C2	
	Oral Mucosa		C2	
	Salivary Glands		C2	
	Bones of the Jaw		C2	
	Temporomandibular Joint		C2	
	Hard Tissue Formation		C2	
	Mineralization		C2	
	Hard Tissue Degradation		C2	
	Enamel		C2	
	Dentine		C2	
	Cementum		C2	
	Periodontal Ligament		C2	
Cytoskeleton	Describe the structure, types, and functions of the cytoskeleton, including microfilaments, intermediate filaments, and	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE

	microtubules, within oral tissues.			
Cell Junctions	Classify and explain the functions of intercellular junctions, including tight junctions, adherent's junctions, desmosomes, and gap junctions, in oral epithelial tissues.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Illustrate the structural features and functions of desmosomes and hemidesmosomes in maintaining the integrity of oral epithelial tissues.	LGIS (Lecture Hall 1)	C2	
Fibroblast	Describe the structure, secretory functions, and role of fibroblasts in the maintenance of the extracellular matrix in oral tissues	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain the steps involved in collagen synthesis and assembly, highlighting its importance in oral connective tissue.	LGIS (Lecture Hall 1)	C2	
Extracellular Matrix	Discuss the composition, function, and degradation processes of the extracellular matrix, emphasizing its role in oral tissue integrity and repair.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Introduction and nomenclature	Name the three major functions of the human dentition	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Describe various ways of classifying human dentition.		C2	
	Define the three dentition periods (deciduous, mixed, permanent). Identify each period's approximate time intervals, initiation, and termination events	LGIS (Lecture Hall 1)	C2	
	Describe the dental Formula for	LGIS	C2	

	permeant and Deciduous dentition	(Lecture Hall 1)		
	Define "succedaneous" and identify succedaneous teeth	LGIS	C2	
	Describe the eruption pattern of primary and permanent dentition		C2	
	Demonstrate understanding of various dental numbering systems (e.g., universal, FDI, Palmer).		C2	
	Describe the anatomical surfaces and land marks of both anterior and posterior teeth, including the roots, using standardized dental terminology.	(Lecture Hall 1)	C2	
	Identify and name tooth surfaces and thirds of tooth surfaces from diagrams or descriptions		C1	
	Differentiate between the crown surfaces of teeth by matching them with their correct general shape (triangular, trapezoidal, or rhomboidal), or by relating the shape to the specific function of the tooth.		C3	
	Identify and name line and point angles based on diagrams or descriptions.	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Define elevations and depressions on the tooth surface.		C2	
	Applications to the type of root structure necessary for proper the function of the different teeth, and the general rules regarding tooth roots and the normal number of		C3	

	branches.			
GENERAL PATHOLOGY				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Pathology	Define the terms: pathology, etiology & pathogenesis	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
Cell Injury	Discuss causes of cell injury	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Describe the types and mechanism of cell injury		C2	
	Identify different types of cellular adaptations to stress with examples		C1	
	Discuss the mechanism of cellular adaptations to stress in detail		C2	
Cell Death	Identify the two types of cell death	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Enumerate the differences between them		C1	
Necrosis	Define necrosis	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Identify its various types with examples		C1	
Apoptosis	Define apoptosis with examples	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Describe its mechanism and pathways in detail		C2	
Intracellular accumulations	Discuss mechanism & types of intracellular accumulations	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Pigmentation	Define pigmentation and identify various endogenous & exogenous pigments	SGD (Tutorial Room)	C2	MCQs, OSVE, OSPE
Calcification	Define calcification and differentiate between dystrophic & metastatic calcification	SGD (Tutorial Room)	C2	MCQs, OSVE, OSPE

Aging	Explain the changes taking place due to aging at the cellular level	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
MICROBIOLOGY				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
General Microbiology	Enlist microbes that cause infectious diseases along with important features.	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Differentiate between Eukaryotes & Prokaryotes.		C2	
Bacteria	Discuss morphology, structure of bacteria including cell wall, cytoplasmic membrane, and cytoplasm of bacteria.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Discuss important structures outside cell wall & bacterial spores.		C2	
	Differentiate between gram positive & negative bacterial cell wall on the basis of staining.		C2	
	Discuss bacterial growth curve.	LGIS (Lecture Hall 1)	C2	
	Define anaerobic & aerobic growth and discuss fermentation of sugars and iron metabolism.		C2	
	Define mutation and its different types and Define Recombination	LGIS (Lecture Hall 1)	C2	
	Discuss transfer of DNA within and between bacterial cells including conjugation, transduction, and transformation.		C2	
	Discuss classification of medically important bacteria.		C2	
	Define normal flora, colonizer,	LGIS	C2	

	dysbiosis, and elaborate significance of normal flora.	(Lecture Hall 1)		
	Discuss normal flora of different body sites including oral cavity, skin, respiratory tract, intestinal tract, etc		C2	
	Define pathogen, pathogenesis, virulence factors, ID50, LD50.	LGIS (Lecture Hall 1)	C2	
	Discuss principles of pathogenesis.		C2	
	Enlist different types of bacterial infections and Describe stages of bacterial pathogenesis.		C1	
	Discuss determinants of bacterial pathogenesis that includes: <ul style="list-style-type: none"> • Transmission • Adherence to cell surfaces. • Invasion • Inflammation & intracellular survival • Toxin production Immuno-pathogenesis		C2	
	Enlist different strains of the same bacteria that can produce different diseases.		C1	
	Mechanisms of Antimicrobial Drugs	LGIS (Lecture Hall 1)	C3	
	Define typical stages of an infectious disease.		C2	
	Discuss role of biofilm and glycocalyx in causing infection.		C2	
	Tabulate the differences between sterilization and disinfection.		C2	
Sterilization and	Define sterilization and disinfection	LGIS	C2	MCQs,

Disinfection	and Describe the various methods of sterilization.	(Lecture Hall 1)		OSVE, OSPE
	Tabulate the differences between sterilization and disinfection.		C2	
PHARMACOLOGY				
Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
General Pharmacology	Students should be able to discuss General Concepts of Pharmacology	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Students should be able to define and describe Pharmacokinetics and Pharmacodynamics		C2	
	Mechanisms of Drugs Transport/ Permeation		C3	
Drugs Transport	Sources of Drugs/ Active Principles	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Enumerate advantages and disadvantages of various Routes of drug Administration		C1	
	Define drug absorption & Bioavailability and factors affecting		C2	
	Define and explain Distribution and Volume of Distribution		C2	
	Define and explain Redistribution and Plasma Protein Binding		C2	
	Explain the concept of Me		C2	
Enzyme Induction and Enzyme Inhibition	Define Enzyme Induction & Enzyme Inhibition	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Describe the clinical significance of enzyme induction and enzyme inhibition with their examples		C2	
	Define drug excretion		C2	
Drug Excretion	Enlist routes of drug excretion	LGIS	C1	MCQs,

	Describe processes of drug excretion through the kidneys	(Lecture Hall 1)	C2	OSVE, OSPE
	Describe factors affecting glomerular filtration & tubular reabsorption		C2	
	Describe the Clinical Significance of Glomerular Filtration, Active Tubular Secretion and Passive Tubular Reabsorption of Drugs		C2	
	Define first pass elimination		C2	
Plasma Half-Life	Define and enlist factors affecting Plasma Half-Life	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain clinical significance of plasma half-life		C2	
	Explain steady state plasma concentration		C2	
Order Kinetics	Define & Explain Elimination and Orders of Elimination – First & Zero Order Kinetics with examples	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Tabulate differences between First order kinetics and Zero Order Kinetics		C2	
Maintenance Dose	Define, explain & calculate maintenance dose and loading dose using appropriate formula	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Drug Clearance	Understand the concept of drug clearance	LGIS (Lecture Hall 1)	C3	MCQs, OSVE, OSPE
	Describe factors affecting drug clearance		C2	
	Explain the Clinical Significance of different values of Drug Clearance			
Signaling Pathways	Elaborate Transmembrane signaling pathways	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Name the Effectors controlled by		C1	

	G-proteins			
Pharmacodynamics	Define Pharmacodynamics, Affinity, Efficacy, Potency	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain Agonist, partial agonist, inverse agonist, bias, allosteric agonists and modulators with examples		C2	
	Define Spare receptor and give clinical importance		C2	
	Describe various Drug-antagonism types with examples		C2	
	Compare & Discuss the information derived from Graded and Quantal dose-response curves		C2	
	Define Median Effective (ED50), Median Toxic (TD50) & Median Lethal Dose (LD50) and its clinical relevance		C2	
	Define Therapeutic index and give its clinical importance		C2	
	Define Therapeutic window and give its clinical importance		C2	
	Define Desensitization, Tachyphylaxis, Tolerance, Resistance, super sensitivity, hypersensitivity, super infection, iatrogenic effect, idiosyncrasy, and give examples		C2	
	Describe the Phenomenon of down regulation and up regulation of receptors		C2	

	Enlist factors affecting Dose and action of Drugs		C1	
Pharmacogenetics	Describe Pharmacogenetics and give examples	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Drug development	Illustrate various phases of Drug development	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Drug Interactions	Describe Drug Interactions	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE

COMMUNITY DENTISTRY AND PUBLIC HEALTH

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Public Health	Define dental public health, health and its dimensions, disease, and illness.	SGD (Tutorial Room)	C2	MCQs, OSVE, OSPE
	Difference Between clinical and public health Dentist.		C2	
	Identify criteria for a disease to be of public health importance.		C2	
	Describe the Concepts of prevention and its levels.		C2	

BEHAVIOURAL SCIENCES

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Bio-psycho-social model	Understand the components and significance of the bio-psycho-social model and systems approach in healthcare	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Appreciate the need for a holistic approach to patient care		C2	

Behavior and Health	Define concepts of normality and abnormality in behavior and health	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Understand how psychology, sociology, and anthropology contribute to health		C2	
	Cultivate an open-minded perspective towards diverse patient behaviors and conditions		C2	
Interdisciplinary Approach	Value the interdisciplinary approach to healthcare	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Behavioral Interventions	Recognize the role of behavior in health outcomes;	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Appreciate the impact of behavioral interventions on patient care		C3	
	Understand the neurological basis of behavior		C2	
Neurological basis of	Relate brain functions to	LGIS (Lecture Hall 1)	C2	MCQs, OSVE,

behavior	behavioral outcome	Hall 1)		OSPE
PRACTICAL/LAB WORK				
PHARMACOLOGY				
Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Calculation	Calculations of drug dosing (e.g., IV infusion) & dose of children.	Practical (Lab)	C2 / P	OSPE
Drug Dosing	Calculations (Mean, Mode, Median, Standard Deviation, and Standard Error), and Metrology.	Practical (Lab)	C2 / P	

Craniofacial-I

Specific Learning Objectives:

ANATOMY				
GROSS ANATOMY				
ENDOCRINOLOGY LOs				
Topic	Specific Learning objectives	Teaching strategy	Levels C/P/A	Assessment
Cell Division	Briefly describe the process of mitosis and meiosis	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Gametogenesis	Describe the process of oogenesis, including the stages and regulatory mechanisms involved.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Describe spermatogenesis and spermiogenesis, highlighting their roles in male fertility.	LGIS (Lecture Hall 1)	C2	
	Describe the embryological basis of teratoma.		C2 / P2	
First week of development: Ovulation to implantation	Discuss the ovarian cycle, hormonal regulation and its phases.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Enlist and explain the main outcomes of fertilization and their relevance to early embryonic development.	LGIS (Lecture Hall 1)	C1	
Second week Of Development: Bilaminar Germ Disc	Describe the embryological basis of hydatidiform mole and its pathological significance.	LGIS (Lecture Hall 1)	C2	
	Describe the formation of embryonic disc, amniotic cavity and yolk sac	LGIS (Lecture Hall 1)	C2	

		1)		
Third Week of Development: Trilaminar Germ Disc	Discuss the process of gastrulation	LGIS	C2	MCQs, OSVE, OSPE
	Discuss the growth and differentiation of the embryonic disc, including the clinical implications of its anomalies.	(Lecture Hall 1)	C2	
	Describe the embryological basis for situs inversus, sirenomelia, holoprosencephaly	LGIS	C2	
	Describe the development of trophoblast during third week of development	LGIS	C2	
Third to Eight Weeks: Embryonic Period	Explain the stages of neurulation and the formation of the neural tube.	SGD	C2	MCQs, OSVE, OSPE
	Describe the process of vasculogenesis and its role in embryonic vascular development.	SGD	C2	
	Discuss craniosynostosis (premature closure of sutures) and its impact on skull and brain growth.	SGD	C2	MCQs, OSVE, OSPE
Birth Defects	Discuss the clinical presentation of numerical and structural chromosomal abnormalities	SGD	C2	MCQs, OSVE, OSPE

ORAL BIOLOGY

Topic	Specific Learning objectives	Teaching strategy	Levels C/P/A	Assessment
Neural Crest Cells and Head Formation	Describe the origin, migration, and differentiation of neural crest cells, and explain their contributions to the formation of bone, cartilage, connective tissues in craniofacial development and the associated development defects.	LGIS	C2	MCQs, OSVE, OSPE
Brachial	Describe the formation, organization, and derivatives (muscles, nerves,	LGIS	C2	MCQs, OSVE, OSPE

(Pharyngeal) Arches and the Primitive Mouth	skeletal structures) of the five pharyngeal (brachial) arches and its clinical implications	1)		
	Identify the embryological contributions of the pharyngeal pouches, grooves, and membranes and its clinical implications (Branchial Cleft Cysts and Fistulas).	LGIS (Lecture Hall 1)	C1	
Formation of the Face	Describe the key facial prominences (frontonasal, maxillary, and mandibular) and their fusion process in forming the forehead, nose, upper lip, and jaw.	SGD (Tutorial Room)	C2	MCQs, OSVE, OSPE
	Discuss the critical periods of facial development, teratogenic factors disrupting it, and the clinical implications of improper facial fusion, including anomalies like cleft lip and midline facial clefts	SGD (Tutorial Room)	C2	
Formation of the Palate	Describe the development of the primary and secondary palate, including the growth, elevation, and fusion of palatal shelves, and discuss the molecular signals involved in palatal development and its clinical implications due to non- fusion like Cleft Palate including the teratogenic factors that cause it.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Formation of the Tongue	Describe the embryonic development of the tongue, contributions of key structures (lateral lingual swellings, tuberculum impar, copula), muscle derivation, and sensory/motor	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE

	innervation and Developmental Defects associated with it like ankyloglossia			
Development of the Mandible and Maxilla	Explain the two types of ossification: intramembranous (flat bones) and endochondral (base of the skull).	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Describe the role of Meckel's cartilage in mandibular development and the process of intramembranous ossification in forming the mandible and maxilla.	LGIS (Lecture Hall 1)	C2	
	Define jaw size anomalies and their embryological basis and clinical impact (Micrognathia and Macrognathia).	LGIS (Lecture Hall 1)	C2	
Development of the Temporomandibular Joint (TMJ)	Describe the development of the temporomandibular joint (TMJ), including the role of secondary cartilage, and potential developmental disorders (congenital dislocation, condylar hypoplasia)	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Early Tooth Development	Describe the formation of the primary epithelial band and its role in initiating tooth development.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain the process of tooth initiation and the molecular signals involved in odontogenesis.		C2	
	Discuss the determination of different tooth types based on patterning signals in the oral ectoderm.		C2	
Stages of Tooth Development	Describe the histological and morphological changes that occur during the budstage of tooth development	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Explain the bud-to-cap transition and the role of epithelial-mesenchymal	LGIS (Lecture Hall	C2	

	interactions in tooth differentiation.	1)		
	Describe the histological and morphological changes that occur during the capstage of tooth development.	LGIS (Lecture Hall 1)	C2	
	Describe the histological and morphological changes that occur during the bellstage of tooth development.	LGIS (Lecture Hall 1)	C2	
	Describe the role of signaling centers such as the enamel knot in controlling tooth shape and structure.	LGIS (Lecture Hall 1)	C2	
Neural and Vascular Contributions	Explain the process of hard tissue formation, including enamel, dentin, and cementum development in reference to late bell stage of the tooth development	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Formation of the Permanent Dentition	Describe the role of nerve innervation and vascularization during early tooth development and how they contribute to tissue differentiation.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Hard Tissue and Root Formation	Discuss the mechanisms of root development and the role of Hertwig's epithelial root sheath (HERS) in determining root length and shape.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Describe the formation of the supporting tissues of the tooth, including the periodontal ligament, cementum, and alveolar bone in reference to late bell stage	LGIS (Lecture Hall 1)	C3	
Primary and Permanent Dentition	Differentiate between the development of primary and permanent dentition and explain the timing of their formation.	SGD (Tutorial Room)	C2	MCQs, OSVE, OSPE

Developmental Anomalies related to Tooth Development and Dental Structures	Enlist, Define and Identify developmental Anomalies in Tooth Number	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
	Enlist, Define and Identify developmental Anomalies related to Tooth Size	LGIS (Lecture Hall 1)	C1	
GENERAL PATHOLOGY				
Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Genetic Disorders: Introduction and causes	Define genetic disorders and explain their causes.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Types of Mutations	Describe different types of mutations (point mutations, insertions, deletions) with examples relevant to dentistry	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Mendel principles and genetic disorders	Explain Mendel's principles and their application to autosomal and X-linked disorder and examples relevant to dentistry	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Chromosomal abnormalities	Describe chromosomal abnormalities (e.g., trisomy, monosomy, translocations) and examples relevant to dentistry	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
Congenital Craniofacial Anomalies and Developmental Defects	Define, Identify and Correlate specific syndromes with their embryological defects Down Syndrome Turner Syndrome Treacher Collins Syndrome Pierre Robin Sequence Goldenhar Syndrome	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE

	Crouzon Syndrome Apert Syndrome Van der Woude Syndrome Hemifacial Microsomia Cleidocranial Dysplasia Nager Syndrome DiGeorge Syndrome			
Genetic Testing	Describe how PCR and sequencing help in genetic testing.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
	Compare different genetic tests and their uses.		C3	
	Differentiate between karyotyping, sequencing, and biochemical tests.		C3	
	Identify the role of genetic tests in prenatal and carrier screening.		C1	

MICROBIOLOGY

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Infectious diseases	Define microbial teratogens and their role in congenital craniofacial and dental anomalies.	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
Infectious diseases	Define TORCH infections and identify the impact of maternal infections (TORCH complex) on embryonic development and their dental implications.	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE
Immunology	Describe the embryological development of the immune system and its relation to congenital immunodeficiencies affecting oral health.	LGIS (Lecture Hall 1)	C1	MCQs, OSVE, OSPE

Salivary glands	Explain how microbial colonization of the oral cavity is influenced by salivary gland development and mucosal immunity.	LGIS (Lecture Hall 1)	C2	MCQs, OSVE, OSPE
PRACTICAL/LAB WORK				
ORAL BIOLOGY				
Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Development of Human embryo with special emphasis on tooth-related structures.	Identify the congenital defects (cleft lip and palate,) on pictures/models:	Lab	C1	OSPE
	Identify the common tongue anomalies on pictures/models: Aglossia, micro/macroglossia, fissured tongue, cleft tongue, bifid tongue, tongue tie		C1	
Tooth Development	Draw and label different stages of tooth development	Lab	C2	OSPE
	Draw and label the root formation of single-rooted and multi-rooted teeth		C2	

CARIOLOGY-I

Specific Learning Objectives:

THEORY					
ORAL BIOLOGY					
Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment	
Enamel	Describe the physical & chemical properties of enamel	SGD (Tutorial Room)	C2	MCQs, OSPE, OSVE	
	Describe the structural organization of enamel and Identify the enamel on radiograph		C2		
	Describe the Differentiation of ameloblasts with reference to reciprocal induction	LGIS (Lecture Hall 1)	C2		
	Describe the life cycle of Ameloblast		C2		
	Enlist the stages of Amelogenesis and describe the pre secretory stage		C1		
	Describe the secretory stage of amelogenesis and role of Tom's process		C2		
	Describe the maturative stage of amelogenesis and process of modulation		C2		
	Classify enamel proteins according to their function during amelogenesis		LGIS (Lecture Hall 1)		C1
	Describe the regulation of pH during enamel formation				C2
	Describe the structural features of enamel, including: (Hunter-Schreger bands, Incremental lines,	LGIS (Lecture Hall 1)	C2		

	Enamel lamellae, Enamel tufts, Enamel spindles, Gnarled enamel)			
	Discuss the effects of fluoride on enamel structure and resistance to caries.	SGD (Tutorial Room)	C2	
	Discuss the principles of enamel etching and its importance in restorative dentistry.		C2	
	Describe the age changes & repair/regeneration of enamel		C2	
	Explain how developmental disturbances can affect enamel formation.		C2	
Dentin	Describe the composition and structure of dentin	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Describe the process of dentinogenesis, including the role of the molecular factors.		C2	
	Differentiate between the three main types of dentin: primary, secondary, and tertiary, and describe their locations and formation.	LGIS (Lecture Hall 1)	C3	
	Identify the structure of dentin radiographically		C2	
	Describe the mechanisms that control dentin mineralization, and differentiate between the pattern of mineralization in mantle dentin and circumpulpal dentin.	LGIS (Lecture Hall 1)	C2	
	Explain the processes of secondary and tertiary dentinogenesis, including the stimuli that trigger their formation.	SGD (Tutorial Room)	C2	

	Describe the structure and function of dentinal tubules.	LGIS (Lecture Hall 1)	C2	
	Differentiate between peritubular and intertubular dentin, and explain their respective compositions and roles.	LGIS (Lecture Hall 1)	C3	
	Explain the formation and significance of sclerotic dentin and interglobular dentin.		C2	
	Describe the structural features of dentin, including incremental growth lines and granular layer of Tom's.		C2	
	Describe the cellular contents of the dental pulp	LGIS (Lecture Hall 1)	C2	
	Discuss the innervations, vascular supply & lymphatic supply of the dentin-pulp complex		C2	
	Explain the mechanisms of dentin sensitivity, focusing on the hydrodynamic theory.		C2	
	Describe the formation and clinical significance of pulp stones (denticles).	LGIS (Lecture Hall 1)	C2	
	Explain how developmental disturbances can affect Dentine formation (Dentinogenesis Imperfecta and dysplasias)		C2	
	Explain the age-related changes		C2	

	that occur in the dentin-pulp complex.			
Saliva	List down the components of saliva. State the functions of saliva.	LGIS (Lecture Hall 1)	C1	MCQs, OSPE, OSVE
Tooth Morphology	Differentiate between the following terms: Lobe, Axial Position, Contact Area, Interproximal space, Embrasure, Height of Contour, Cervical Line, Gingival Line, Epithelial Attachment.	LGIS (Lecture Hall 1)	C3	MCQs, OSPE, OSVE
	Describe the number and names of the lobes of the anterior and posterior teeth	LGIS (Lecture Hall 1)	C2	
	Describe and differentiate contact areas and height of contours including their location, size, function, age related changes, and clinical significance	LGIS (Lecture Hall 1)	C2	
	Describe the components, boundaries and functions of interproximal space and embrasures	LGIS (Lecture Hall 1)	C2	
	Describe the depressions on tooth surface (pit, fissures, and developmental groves)	LGIS (Lecture Hall 1)	C2	

PRACTICAL/LAB

ORAL BIOLOGY

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Enamel	Draw and label "Enamel rods: fish scale pattern & keyhole pattern	Practical Lab	C2 / P	OSPE
	Ameloblasts (life cycle)		C2 / P	
	DEJ with organic defects		C2 / P	

	<p>Draw and label Enamel rods, striae of retzius, bands of Hunter & Schreger, gnarled enamel, DEJ, tufts, lamella, spindles & neonatal lines.</p>		C2 / P	
	<p>Identify amelogenesis imperfecta (hypoplastic, hypocalcified & hypomaturative types) & fluorosis.</p>		C1	
	<p>Identify enamel on x-rays.</p>		C1	
	<p>Prepare the ground section of the tooth, mount it on a microscopic slide & identify the structural details of enamel & dentin</p>		C3	
Dentin	<p>Draw & label primary, secondary & tertiary dentin, dentinal tubules in crown & root portions, dentin-pulp complex showing dentinal tubules, pre dentin & zones of dental pulp showing its different cells, odontoblast with different developmental shapes, peritubular and intra tubular dentin, inter globular dentin, dead tracts, pulp stones.</p>	Practical Lab	C2	OSPE
	<p>Identify dentin genesis imperfect, identify dentin & pulp cavity on x-rays.</p>		C1	

Theory

Biochemistry

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
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Biochemical Role of carbohydrates in Dental Caries	Explain the biochemical properties of sucrose, glucose, and fructose.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Compare the cariogenic potential of sucrose, glucose, and starch,		C3	
Biofilm Formation and Plaque Biochemistry	Define dental plaque and explain its composition.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Discuss the role of sucrose in synthesizing extracellular polysaccharides (e.g., glucans via glucosyltransferases) and their contribution to plaque biofilm adhesion and stability		C2	
	Discuss the impact of diet, pH, and host factors on plaque development.	LGIS (Lecture Hall 1)	C2	
Carbohydrate Metabolism and Acidogenesis in relation to Dental Caries	Illustrate the glycolytic pathway in cariogenic bacteria and its role in acid production.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Explain the process of lactic acid fermentation, including the conversion of pyruvate into organic acids.		C2	
	Explain the concept of acidogenicity and aciduricity in cariogenic bacteria.		C2	
pH and Buffering Systems in Oral Health	Define Critical pH. Relate the critical pH for enamel demineralization (5.5 for enamel and 6.2 for dentine) to acid production and the role of saliva in buffering pH and supplying calcium/phosphate for remineralization.	SGD	C2	MCQs, OSPE, OSVE

Saliva's Biochemical Role	Identify and analyze the components of saliva (salivary proteins, enzymes, bicarbonate, statherin, lysozyme, lactoferrin, amylase, histatins) and their functions in maininating oral pH and enamel repair	LGIS (Lecture Hall 1)	C1	MCQs, OSPE, OSVE
	Describe the buffering action of saliva (bicarbonate, phosphate, and protein buffers).		C2	
	Discuss factors that affect salivary flow and pH regulation.	LGIS (Lecture Hall 1)	C2	
	Explain the role of carbonic anhydrase in maintaining oral pH.			
Fluoride's Biochemical Mechanism	Discuss how fluoride disrupts bacterial glycolysis and acid production.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
Biochemistry of Artificial Sweeteners and Sugar Substitutes	Compare the metabolism of sugar alcohols (xylitol, sorbitol) versus fermentable sugars in the oral cavity.	LGIS (Lecture Hall 1)	C3	MCQs, OSPE, OSVE
	Explain the mechanism by which xylitol inhibits Streptococcus mutans growth and acid production.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE

COMMUNITY DENTISTRY AND PUBLIC HEALTH

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Dental Caries	Discuss the importance and role of diet in caries.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Discuss the concept and importance of Stephen curve in		C2	

	dental caries			
	Role of dental biofilm in acid		C2	
THEORY				
ORAL PATHOLOGY				
Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Microbiology and Pathogenesis of Caries	Describe the importance of oral hygiene and its effects on caries. Define phenomenon of dental caries.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Explain the concept of Keve's Circles in the etiology of dental caries. Identify the etiological factors and explain their effects (pathogenesis) in the development of caries.		C1	
Prevention of dental caries	Classify Basic types of toothbrushing	LGIS (Lecture Hall 1)	C1	MCQs, OSPE, OSVE
	The clinical effect of tooth cleaning		C2	
	The effect of dental flossing		C2	
	Identify the basic concept and importance of fluoride in caries prevention		C1	
	Discuss preventive measures, such as fluoride treatments, improved oral hygiene practices, and dietary modifications.		C2	

	Describe the microbiological aspect of caries; the role and characteristics of cariogenic bacteria.		C2	
	Define plaque and stages of plaque development		C1	
	Describe the changes that develop in enamel and dentin of erupted teeth in association with microorganisms.		C2	
Pit and Fissure Caries	Describe the anatomical features of pits and fissures and their role in caries susceptibility.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Explain the preventive strategies, including using sealants and fluoride applications.		C2	
Smooth Surface Caries	Discuss the factors that increase caries risk on smooth surfaces, such as poor oral hygiene and dietary habits.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Describe the appearance of smooth surface caries and its progression pattern.		C2	
	Recognize the role of fluoride in preventing smooth surface caries.		C1	
Root Caries	Identify the unique etiological factors associated with root caries, including gingival recession and xerostomia.	LGIS (Lecture Hall 1)	C1	MCQs, OSPE, OSVE
	Describe the clinical features and progression of root caries.		C2	
Active Caries	Describe the characteristics of active caries, including appearance,	LGIS (Lecture	C2	MCQs, OSPE,

	texture, and progression.	Hall 1)		OSVE
	Understand the clinical significance of active caries in its potential to progress and cause further tooth damage.		C3	
	Develop strategies to manage active caries, focusing on preventive, minimally invasive, and restorative approaches.		C3	
Arrested Caries	Define arrested caries and describe their clinical features, such as smooth, shiny surfaces and hardness upon probing.	LGIS (Lecture Hall 1)	C2	MCQs, OSPE, OSVE
	Understand the biological process of caries arrest and remineralization.		C3	
	Identify the factors that promote caries arrest.		C1	

PRACTICAL/LAB WORK

COMMUNITY DENTISTRY

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Prevention of Dental Caries	Identify fluoride gel and procedure to apply it	Practical Lab	C2	OSPE

PRISME

Sr. No.	Domain	Learning Outcomes
1.	Professionalism	<ul style="list-style-type: none"> • Recognize attributes of professionalism (respect, integrity, accountability) • Define professionalism in dentistry • Identify unprofessional behaviors • Practice patient-centered communication (role play) • Apply basic reflective practice
2.	Research	<ul style="list-style-type: none"> • Understand fundamentals of academic writing i.e., official applications, letters, report writing, etc. • Define research, inquiry, and evidence-based dentistry • Recognize importance of research in dentistry • Identify forms of scientific writing (editorial, article, review, case report, meta-analysis) • Explain IMRAD structure • Differentiate types of health research (basic, clinical, applied, public health) • Enlist differences between quantitative and qualitative research • Describe basic principles of research ethics
3.	Informatics	<ul style="list-style-type: none"> • Practice email etiquette & online communication norms (WhatsApp/Social Media Platforms) • Use Word/Google Docs for academic writing basics

		<ul style="list-style-type: none"> • Apply safe internet use, recognize credible vs. unreliable sources
4.	Social Responsibility	<ul style="list-style-type: none"> • Define social responsibility in dentistry • Describe role of dentist in public health promotion • Identify cultural diversity in Pakistan • Explain principles of ethics (autonomy, beneficence, non-maleficence, justice) • Take a proper dental consent prior to treatment
5.	Management & Entrepreneurship	<ul style="list-style-type: none"> • Describe the concept of teamwork and its relevance in dental practice. • Observe and explain basic workflow (hierarchy) in academic and lab settings. • Identify and apply simple time management strategies for balancing academic and personal tasks. • Explain and apply 7Cs of communication • Demonstrate responsibility in small assigned academic or group-based tasks.
6.	Evidence Based Dentistry	<ul style="list-style-type: none"> • Define Evidence-Based Dentistry. • Explain the significance of EBD in clinical decision-making. • Identify the components of EBD: best available evidence, clinical expertise, and patient preferences.

CFR-C

Sr. No.	CFR-C	Teaching Strategy	Levels C/P/A	Assessment
1.	Hand Washing	SGD (Skills Lab)	C3/P	OSPE/OSCE
2.	Gloving	SGD (Skills Lab)	C3/P	OSPE/OSCE
3.	Tooth Brushing	SGD (Skills Lab)	C3/P	OSPE/OSCE
4.	Flossing Technique	SGD (Skills Lab)	C3/P	OSPE/OSCE
5.	Commination Skills	SGD (Skills Lab)	C1/P	OSPE

ASSESSMENT POLICY

BLOCK-I								
Sr. No.	Theory			Practical				Total
1-	Foundation-I	48 MCQs	120 Marks	Practical Clinical Examination	07 OSPE (9Marks each)	07 Stations *9= 63 Marks	120 Marks	300 Marks
2-	Craniofacial-I	42 MCQs			01 OSCE (9 Marks each)	01 Station *9= 09 Marks		
3-	Cariology-I	30 MCQs			08 OSVE (9 Marks each)	08 Station *6= 48 Marks		
Internal Assessment 10%			Internal Assessment 10%					

BLOCK EXAM TOTAL = 300 MARKS			
Theory Exam	120 Marks	Practical/Clinical Exam	120 Marks
Internal Assessment 10%	30 Marks	Internal Assessment 10%	30 Marks

Theory Exam = Internal Assessment	150 Marks	Practical/Clinical Exam + Internal Assessment	150 Marks
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INTERNAL ASSESSMENT

It shall constitute 20% of the total assessment at the end of the academic year

	SCORING PARAMETER	WEIGHTAGE (PERCENTAGE)
Theory 10%	Attendance	75% attendance -1% >85% attendance -2%
	Block exam	5%
	Continuous assessment	3%
Practical 10%	Attendance	75% attendance -1% >85% attendance -2%
	Block Exam	5%
	Portfolio-Clinical Logbooks (CFRC,PRISME)	3%

Time Tables:

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

ASSESSMENT TOOLS

In order to ensure transparency, validity, and reliability in student assessment, it is hereby notified that the following assessment tools shall be used as integral components of the BDS Assessment Program.

These assessment tools have been selected in accordance with the examination and assessment framework prescribed by University of Health Sciences Lahore

The following tools shall be employed for both **formative and summative assessments** of BDS students:

1. **Multiple Choice Questions (MCQs)** – to assess cognitive knowledge, clinical reasoning, and application of concepts.
2. **Short Answer Questions (SAQs)** – to evaluate analytical thinking, interpretation, and written expression of knowledge.
3. **Objective Structured Practical Examination (OSPE)** – to assess laboratory and practical competencies in basic and pre-clinical sciences.
4. **Objective Structured Clinical Examination (OSCE)** – to evaluate clinical skills, communication skills, professionalism, and patient-centered competencies.
5. **Objective Structured Viva Examination (OSVE)** – to assess conceptual understanding, clinical reasoning, and professional judgment through structured viva stations.

All HODs are directed to incorporate the above-mentioned tools in their internal assessments, send-up examinations, and professional examination preparation processes.

LEARNING RESOURCES FOR STUDENTS

ANATOMY

- Color Atlas of Anatomy by Mc Minn
- Clinically Oriented Development Anatomy by K. L. Moore
- Anatomy for Dental Students by D. R. Johnson & K. L. Moore
- Clinical Neuroanatomy by R. Snell
- High Yield Neuroanatomy by James D Fix
- Last's Anatomy by R.M.H. McMinn
- Cunningham's Manual of Practical Anatomy
- Gray's Text Book of Anatomy
- Text Book of Anatomy by Hamilton
- Langman's Medical Embryology by Thomas W. Sadler

HISTOLOGY

- Colour Textbook of Histology (2nd Ed) 2001. Gartner & Hiatt. Published by Saunders. ISBN 0721688063
- Basic Histology (10th Ed) Junqueira, Carneiro Contopoulos. Published by Appleton & Lange. ISBN 0838503764
- Essential Histology (1993 Ed. Rev.) Published by Lippincott. ISBN 0397510624
- Wheater Functional Histology Text & Colour Atlas (4th Ed) 2000. Wheater, Burkitt, Young & Heath. Published by Churchill Livingstone. ISBN 0443056129
- Atlas of Functional Histology 1999 Kerr. Published by Mosby ISBN 0723430721
- Human Histology (2nd Ed) 1996 Stevens & Lowe. Published by Mosby. ISBN 0723424853

PHYSIOLOGY

- Textbook of Medical Physiology (10th Ed) Sept.2000 Guyton. Published by Saunders. ISBN 072168677X.
 - Review of Medical Physiology (20th Ed) 2001 Ganong. Published by Appleton & Lange. ISBN 0838582826
 - Physiology (2nd Revised Ed) 1998 Linda S Costanzo. Published by W B Sanders, ISBN 0721666116
 - Lecture Notes on Human Physiology (4th Ed) Bray JJ, Cragg, PA, MacKnight ADC, Mills RG & Taylor D W. Published by Blackwell, ISBN 0865427755.
 - Human Physiology (8th Ed) 1998. Vander, Sherman & Luciano. Published by McGraw Hill. ISBN 0071182543
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- Principles of Physiology (3rd Ed) 2000 Berne RM & Levy MW. Published by Mosby (HBJ). ISBN 0-323-00813-5
- Physiology (4th Ed) 1998. Berne R M & Levy M W. Published by Mosby (HBJ). ISBN 0815109520.
- Guyton and Hall - Physiology Review (MCQ Book)

BIOCHEMISTRY

- Lippincott's illustrated Reviews, Biochemistry
- Basic and Applied Dental Biochemistry by Williams & Elliott Harper's Biochemistry
- Berg, Tymoczko & Stryer, 5th edition (2002). Biochemistry
- Essentials of Medical Biochemistry Vol 1,2 by Mushtaq Ahmed

ORAL BIOLOGY & TOOTH MORPHOLOGY

- Oral Histology Development, Structure & Function by Richard Ten Cate
- Orban's Oral Histology & Embryology by Orban
- Tooth Morphology by Fuller
- Wheeler's Atlas of Tooth Form by Wheeler
- Oral Physiology by Levalle

PATHOLOGY & MICROBIOLOGY

- Robbins & Cotran Pathologic Basis of Disease
- Review of Medical Microbiology and Immunology by Levinson
- Textbook of Pathology by Walter & Israel

COMMUNITY & PREVENTIVE DENTISTRY

- Textbook of Preventive and Community Dentistry by S.S. Hiremath
 - Community Oral Health by Cynthia Pine & Rebecca Harris
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