



STUDY GUIDE BLOCK-IV

BDS YEAR-2

BLOCK: IV
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.
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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.	Dr. Shahid Saeed	Professor Physiology	Coordinator Block-IV
4.	Prof. Dr Raheela	Assoc. Professor Oral Biology	Coordinator Block-V
5.	Dr. Rabia Asad	Professor Community Dentistry	Coordinator Block-VI
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. Zenab Yaasir	Professor Dental Materials	Member
15.	Dr Ahmed Mehmood	Associate Professor Behavioral Science	Member
16.	Dr. Rabeet Asif	DME	Proof reading & Editing
17.	Dr. Nivish	DME	Developer Block-IV

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. Definesthe 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-IV

Sr. No.	MODULES	WEEKS
1-	Craniofacial-III	3
2-	Occlusion-II	3
3-	Hepatorenal	4
	Total	10 Weeks

CRANIOFACIAL-III

Specific Learning Outcomes:

THEORY

GENERAL ANATOMY

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Cervical Fascia and Fascial Spaces	Explain the parts and attachments of the deep cervical fascia and relate them to the spread of neck infections. Describe the facial spaces of head and neck and explain their relevance to the spread of infections.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Muscles of the Neck	Identify and describe the attachments, actions, and nerve supply of the major muscles of the neck (platysma, sternocleidomastoid, infrahyoid, suprahyoid, scalene).	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE
	Explain the anatomical basis, differentiate the types, and correlate anatomical changes with the clinical presentation of torticollis.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Triangles and surface anatomy of the Neck	Identify the boundaries and list the contents of the anterior and posterior triangles of the neck.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE
	Trace the origin, course, branches, and	LGIS (Lecture Hall 2)	C2	MCQs,

Blood Vessels of the Neck	distribution of the common and external carotid arteries.			OSPE, OSVE
	Describe the formation and drainage of the jugular venous system and interpret its clinical importance.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Describe the origin, course, major branches, and distribution of the subclavian artery.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Explain the formation, tributaries, and drainage areas of veins forming the jugular venous system.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Summarize the venous drainage of the neck region.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Lymphatic Drainage of the Neck	Identify the superficial and deep cervical lymph nodes and describe their locations and drainage areas.	SGD (Dissection Hall)	C3	MCQs, OSPE, OSVE
Nerves of Neck	Describe the extracranial course, major branches, and functional distribution of the glossopharyngeal, vague, and accessory nerves.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Describe the location, formation, branches, and distribution of the cervical plexus.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE

	Explain the location, formation, and branches of cervical sympathetic ganglia.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Correlate the anatomical basis of Horner's syndrome with its clinical presentation.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE
Skeletal Framework of the Neck	Identify and describe the anatomical features of the hyoid bone.	SGD (Dissection Hall)	C3	MCQs, OSPE, OSVE
	Classify the cervical vertebrae and distinguish their characteristic features.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
	Describe the anatomical features of typical and atypical cervical vertebrae.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Classify the joints of cervical vertebrae and explain associated ligaments, movements, muscles, and neurovascular supply.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
Larynx: Structure and Function	Describe the parts of the larynx, including their extent, anatomical features, framework, and neurovascular supply.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Identify and describe the attachments, actions, and nerve supply of intrinsic and extrinsic	SGD (Dissection Hall)	C3	MCQs, OSPE, OSVE

	muscles of the larynx.			
	Describe and identify the histological features of the larynx under microscope.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Thyroid and Parathyroid Glands	Describe the location, anatomical features, and vascular supply of thyroid and parathyroid glands.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Explain the embryological development of thyroid gland and relate it to common congenital anomalies (thyroglossal cyst, fistula).	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Back of Neck	Describe the muscles of back of neck and sub occipital triangle	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE

PATHOLOGY

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Principles and Phases of Wound Healing	Explain the basic principles and sequence of events involved in wound healing, including hemostasis, inflammation, proliferation, and remodeling.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Describe and differentiate the phases of wound healing, emphasizing the cellular	LGIS (Lecture Hall 2)	C2	

	and molecular events in each stage.			
	Analyze the local and systemic factors that influence healing at each phase.	LGIS (Lecture Hall 2)	C3	
Cellular and Molecular Basis of Repair	Explain the roles of different cell types (neutrophils, macrophages, fibroblasts, endothelial cells, epithelial cells) and correlate their functions with growth factors involved in periodontal tissue repair and regeneration.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Describe the major phases of the cell cycle and relate them to tissue growth and repair.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Classify and discuss the characteristics of labile, stable, and permanent cells in relation to tissue regeneration.	LGIS (Lecture Hall 2)	C1	
Types and Complication of Healing	Describe and compare the different types of tissue healing—primary, secondary, and tertiary intention—based on mechanism, tissue response, and clinical presentation.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Enumerate and explain the sequential steps involved in scar formation.	LGIS (Lecture Hall 2)	C1	
	Identify common complications such as infection, wound dehiscence, hypertrophic scar, and keloid formation.	SGD (Dissection Hall)	C3	
	Describe the stages of wound healing in an extracted tooth socket, highlighting cellular and tissue-level changes.	LGIS (Lecture Hall 2)	C2	

PRACTICALS / LAB WORK

ANATOMY

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Laryngeal Nerve	Identify the course and key functions of the laryngeal nerves on anatomical models/ preserved specimens.	Practical Lab	C3/P	OSPE
	Describe how damage to laryngeal nerve leads to common clinical signs.	Practical Lab	C2/P	
Thyroid	Identify and illustrate the histological features of thyroid under light microscope.	Practical Lab	C3/P	OSPE
Parathyroid	Identify and illustrate the histological features of parathyroid glands under light microscope.	Practical Lab	C3/P	OSPE

OCCLUSION-II

Specific Learning Outcomes:

THEORY				
ORAL BIOLOGY & TOOTH MORPHOLOGY				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Morphology of Premolars	Describe the general considerations and morphological features of maxillary premolars, including labial, lingual, mesial, distal, and occlusal aspects, as well as root morphology.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Describe the general considerations and morphological features of mandibular premolars, including labial, lingual, mesial, distal, and occlusal aspects, as well as root morphology.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Differentiate maxillary from mandibular premolars using key identification criteria such as cusp morphology, root anatomy, and occlusal patterns.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE

SCIENCE OF DENTAL MATERIALS				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
General Principles of Dental Materials	Explain the fundamental physic-mechanical, biological, and chemical principles that determine the clinical behavior and performance of dental materials.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Structure of Matter and Adhesion	Describe the structure of matter and explain the fundamental principles of adhesion among dental materials.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Classification of Dental Materials	Classify dental materials into metals, ceramics, polymers and composites.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
Biocompatibility and Safety	Explain the concepts of safety and biocompatibility in dental biomaterials.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Biological Considerations	Define key biological terms related to dental materials, including biocompatibility and hypersensitivity (Type IV).	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
Corrosion and Toxicity	Discuss the effects of toxicity and corrosion and their influence on the biological performance of dental materials.	SGD (Tutorial Room)	C2	MCQs, OSPE, OSVE
Gypsum	Define gypsum and identify various gypsum products used in	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE

Products and Model Fabrication	dentistry.			
	Describe the composition, hydration reaction, and crystal formation process of gypsum products.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Classify gypsum products according to their composition and intended use in dental procedures.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
	Discuss the ideal physical and mechanical properties, setting expansion, and setting time of gypsum products.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Demonstrate the correct proportioning, mixing, pouring, and trimming techniques for gypsum materials.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE
	Identify and explain factors that influence the setting time, expansion, and strength of gypsum materials.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE
	Explain infection control measures and safety precautions during the pouring and handling of impressions and models.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Analyze common causes of air bubbles, inaccuracies, and fractures in gypsum models and propose preventive measures.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE

	Describe the role and clinical uses of diagnostic casts and working dies in prosthodontic procedures.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Cast /Materials	Describe the requirements and desirable properties of dental cast materials.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Casts and dies	Differentiate between a die and a cast in dental applications.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE
Die Materials	List the advantages and disadvantages of gypsum and enumerate miscellaneous types of die materials.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
Impression Materials	Classify impression materials used in dentistry according to setting mechanism and clinical use.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
	Describe the ideal properties and characteristics of impression materials.	SGD (Tutorial Room)	C2	MCQs, OSPE, OSVE
	Compare the advantages, disadvantages, and clinical indications of different impression materials.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Analyze the factors that affect the dimensional accuracy and surface detail of dental impressions.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSVE
Infection Control	Describe methods for disinfecting and storing dental impressions to prevent	SGD (Tutorial Room)	C2	MCQs, OSPE, OSVE

	distortion and cross-infection.			
Hydrocolloids	Describe the composition, setting mechanism, and classification of elastic impression materials, including hydrocolloids	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Explain the clinical steps for mixing, loading, and inserting hydrocolloid impression materials		C2	MCQs, OSPE, OSVE
	Explain the composition, manipulation, and applications of duplicating materials in prosthodontics.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
	Identify and evaluate common impression errors for hydrocolloid impressions and suggest corrective measures.		C3	MCQs, OSPE, OSVE
	Explain the clinical applications, advantages, hydrocolloid impression materials.		C2	MCQs, OSPE, OSVE
Dental Waxes	Classify the types of waxes used in dentistry according to their use as pattern, processing and impression waxes	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
	Explain ideal properties of dental waxes		C2	MCQs, OSPE, OSVE
	Discuss the components, properties, and application of		C2	MCQs, OSPE, OSVE

	dental waxes.			
	Explain the ideal requirements for inlay wax.		C2	MCQs, OSPE, OSVE
PROSTHODONTICS				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Overview of Prosthodontics and Its Branches	Explain the role of prosthodontics in oral rehabilitation and differentiate between its major branches.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Characteristics and Significance of Ideal Occlusion	Explain the characteristics of ideal occlusion in natural dentition and its significance for oral function and health.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Kennedy's Classification of Partial Edentulism	Describe Kennedy's Classes I–IV and their modifications.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Applegate's Rules	State Applegate's Rule governing the application of Kennedy's Classification.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
Removable	Describe the types of Removable partial dentures.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE

Partial Dentures	Enlist the components of a removable partial denture.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSVE
OPERATIVE DENTISTRY				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Instruments & armamentarium	Recognize different instruments used in tooth preparation. Describe their functions. Differentiate between hand and rotary instruments.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Isolation	Explain the importance of isolation in dental procedures, including its role in moisture control, visibility, infection control, and treatment success Enlist components of rubber dam Outline stepwise procedure for application of rubber dam.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
Fundamentals of tooth Preparations	Discuss the role of principles of cavity preparation, including outline form, resistance form, retention form, and convenience form in ensuring the longevity and effectiveness of restorative treatments.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE

Cavity Classification and Diagnosis	Describe G.V. Black's classification & ICDAS system caries classification of caries and identify various classes of carious lesions using images.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSVE
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PRACTICALS / LAB WORK

ORAL BIOLOGY & TOOTH MORPHOLOGY

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Premolars	Identify and draw the outlines of all premolars (labial, lingual, mesial, distal, and occlusal aspects) on paper or models, labeling morphological features such as cusps, ridges, fossa, contact points, roots, and pulp canals	Practical Lab	C3/P	OSPE
	Accurately label all key morphological features (e.g., cusps, marginal ridges, transverse ridges, triangular ridges, developmental depressions, pits, and grooves) on premolar models	Practical Lab	C1/P	OSPE

	Carve anatomical models of premolars using soap blocks/ wax blocks	Practical Lab	C3/P	OSPE
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SCIENCE OF DENTAL MATERIALS

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Impression Materials	Demonstrate and perform proper techniques for manipulation of hydrocolloid impression materials.	Practical Lab	C3/P	OSPE
Gypsum	Manipulate soft plaster using the recommended technique and water/powder ratio.	Practical Lab	C3/P	OSPE
	Build a plaster slab following the allocated dimensional guidelines.	Practical Lab	C3/P	OSPE
	Demonstrate the technique of model pouring.	Practical Lab	C2/P	OSPE
	Demonstrate the process of fabricating dental cast/model including trimming and finishing of the study models.	Practical Lab	C2/P	OSPE
	Differentiate between study casts, working casts, and refractory casts based on purpose and fabrication.	Practical Lab	C3/P	OSPE

Waxes	Demonstrate and perform the steps of baseplate wax up on the given model.	Practical Lab	C2/P	OSPE
	Identify and classify the different types of dental waxes used in dentistry based on their usage		C3/P	OSPE
	Demonstrate the correct manipulation techniques for various dental waxes, applying them appropriately in laboratory and clinical procedures.		C2/P	OSPE

PROSTHODONTICS

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Tooth Removal from Cast (Kennedy's Classes)	Identify and remove specific teeth from a cast to simulate different Kennedy's classes for partial denture design.	Practical Lab	C3/P	OSPE
C-Clasp Fabrication	Fabricate a C-clasp for a removable partial denture, demonstrating proper adaptation and finishing.	Practical Lab	C3/P	OSPE
Wax-Up and Articulation for Partial Dentures	Fabricate Occlusal Rim- perform wax-up	Practical Lab	C3/P	OSPE
Dental Setup for Partial	Arrange teeth for both upper and lower partial dentures, ensuring correct occlusion.	Practical Lab	C3/P	OSPE

Dentures				
Flasking for Partial Dentures	Demonstrate the process of flasking for both upper and lower partial dentures.	Practical Lab	C2/P	OSPE
Dewaxing for Partial Dentures	Perform dewaxing of flasks accurately while maintaining denture form.	Practical Lab	C3/P	OSPE
Packing, Curing, and Finishing of Partial Dentures	Carry out packing, curing, and finishing steps for both upper and lower partial dentures.	Practical Lab	C3/P	OSPE

OPERATIVE DENTISTRY

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Instruments and Equipment for Tooth Preparation and Restoration	Identify the instruments and equipment for tooth preparation and filling.	Practical Lab	C3/P	OSPE
Rubber Dam Application and Isolation Techniques	Perform rubber dam application for isolation on typodont	Practical Lab	C3/P	OSPE

Clinical Ergonomics	Perform patient and operator position and instrument exchange.	Practical Lab	C3/P	OSPE
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HEPATORENAL

Specific Learning Outcomes:

THEORY				
PHYSIOLOGY				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Vascular Anatomy and Functional Correlation of liver	Explain the vascular organization of the liver and correlate it with its roles in detoxification, metabolism, and hemostasis.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
	Differentiate between hemolytic and obstructive jaundice.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Structure Function Relationships in renal physiology	Explain the processes of glomerular filtration, tubular reabsorption	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
	State normal GFR and filtration fraction values explain determinants of GFR.		C3	
	Describe the mechanism of autoregulation of GFR		C2	
BIOCHEMISTRY				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels	Assessment

			C/P/A	
Nitrogen Removal from Amino Acids	Differentiate between L-alpha amino acids and alpha-keto acids (carbon skeleton). Enumerate alpha-keto acids of alanine, glutamate, and aspartate.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
	Define transamination and explain its biochemical significance.		C1	MCQs, OSPE, OSCE
	Describe the reactions catalyzed by alanine aminotransferase (ALT) and aspartate aminotransferase (AST)		C2	
	Discuss the role of pyridoxal phosphate (PLP) in transamination reactions		C2	
	Explain the diagnostic importance of AST and ALT		C2	
	Define oxidative deamination and outline its physiological significance		C1	
	Describe the reaction catalyzed by glutamate dehydrogenase (GDH)		C2	
Sources and Transport of Ammonia	Enlist sources of ammonia. Outline the two major mechanisms for transport of ammonia from peripheral tissues to liver. Enumerate transport forms of	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSCE

	ammonia.			
Disposal Of Amino Groups: Urea Cycle	Explain the reactions, regulatory significance of the urea cycle, and state the normal blood urea levels.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Ammonia Metabolism and Hyperammonemia	Describe the normal blood ammonia levels and explain the biochemical basis of ammonia-induced CNS toxicity.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
	Enlist inherited & acquired causes of hyperammonemia.		C1	
	Describe the effects of hyperammonemia on brain.	LGIS (Lecture Hall 2)	C2	
	Discuss the dietary and pharmacological strategies used in its management of hyperammonemia.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Glutamine Metabolism	Briefly describe the metabolism & importance of glutamine in human body.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Heme Degradation and Jaundice	Describe heme degradation and jaundice.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Liver Function and Clinical	Interpret elevated ALT and AST values in patient histories to anticipate potential bleeding risks	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE

Correlations in Dentistry	and altered drug metabolism during dental treatment.			
renal structure–function	Explain renal structure–function relationships underlying fluid balance, drug excretion, and homeostasis.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
pH Regulation Mechanisms	Explain the renal mechanisms involved in hydrogen ion homeostasis.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE

PHARMACOLOGY & THERAPEUTICS

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Renal Regulation	Relate renal anatomy and hormone regulation to mechanisms of drug excretion and hemostasis.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Diuretics	Classify 5 major types of diuretics and relate them to their sites of action	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSCE
	Describe the major applications and the toxicities of acetazolamide, thiazides, loop diuretics, and potassium-sparing diuretics.		C2	MCQs, OSPE, OSCE

PATHOLOGY

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
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Pathogenesis of Hepatic Diseases	Explain the microscopic changes with the pathogenesis of common hepatic diseases.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Clinical Features of Hepatic Disorders	Describe the systemic clinical features of hepatitis, cirrhosis, and hepatic failure.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Liver Function Tests	Interpret basic liver function tests (ALT, AST, ALP, INR) to assess hepatic function and disease severity.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Hepatic Coagulopathies	Explain the mechanisms of hepatic coagulopathies and relate them to increased bleeding risk.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Oral Manifestations of Liver Disease	Identify oral soft-tissue changes associated with hepatic disease and correlate them with underlying cholestatic mechanisms.	SGD (Tutorial Room)	C3	MCQs, OSPE, OSCE
Hemostatic Management in Liver Disease	Assess bleeding risk using clinical and laboratory indicators and implement appropriate hemostatic measures for cirrhotic patients.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Infection Control and Systemic Links	Implement cross-infection control measures and educate patients about periodontal–systemic relationships in liver disease.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Intrinsic Tooth Discolorations	Recognize intrinsic tooth discolorations (chlorodontia, porphyrin, ochronosis) and	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSCE

	counsel patients			
Renal Failure and Dialysis	Explain the systemic findings in renal failure and identify dialysis considerations, including vascular access sites.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Renal Function Tests	Explain GFR, CBC, and related renal function tests in distinguishing acute from chronic kidney disease.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Dental Management in Renal Disease	Interpret urea and creatinine levels and apply findings to modify dental treatment plans.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Oral Manifestations of Renal Disease	Describe the systemic and oral manifestations of CKD, nephrotic syndrome, and dialysis dependency.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Edema—Types and Mechanisms	Define and classify types of edemas and explain their underlying causes.	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSCE
Hepatitis	Define Hepatitis. Enlist various Hepatitis causing agents	LGIS (Lecture Hall 2)	C1	MCQs, OSPE, OSCE
	Discuss Hepatitis A, B, C, D, E & G virus with its epidemiology, virulence factors, pathogenesis, lab diagnosis & prevention.		C2	
ORAL MEDICINE				
Topic	Specific Learning Outcomes	Teaching	Levels	Assessment

		Strategy	C/P/A	
Oral Manifestations of Hepatic Diseases	Explain the oral implications of hepatitis, cirrhosis, and hepatic failure.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Dental Considerations in Hepatic Disorders	Recognize hepatic conditions most relevant to general dental care and their impact on treatment planning.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Infection Control and Post Exposure Prophylaxis for Hepatitis	Explain the principles of post-exposure prophylaxis (PEP) for Hepatitis B and Hepatitis C.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Drug Dose Modification in Hepatic Impairment	Apply dose-modification charts for analgesics, local anesthesia, and common antibiotics in hepatic patients.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Drug Dose Modification in Hepatic Impairment	Interpret lab findings CBC, RFTs (urea, creatinine), Bleeding time and (PT, APTT, & INR) to plan dental treatment for acute and chronic renal conditions	SGD (Tutorial Room)	C3	MCQs, OSPE, OSCE
Oral Health Considerations in Renal Dialysis Patients	Describe the risk factors for patients undergoing renal dialysis associated with oral cavity.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
PSYCHIATRY & BEHAVIORAL SCIENCES				
Topic	Specific Learning Outcomes	Teaching	Levels	Assessment

		Strategy	C/P/A	
Communication	Explain the principles for communicating diagnoses ,treatment modifications, and infection-control measures to patients with hepatic disease in a clear, non-stigmatising manner.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Motivational Interviewing Skills	Explain the OARS motivational interviewing (MI) micro-skills and describe how they can be applied to improve patient adherence to liver and kidney health recommendations	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Shared Decision-Making	Explain the principles and appropriate use of shared-decision tools in developing a bleeding-risk mitigation plan collaboratively with the patient and the physician	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Anxiety-Reduction Techniques	Describe the principles and rationale of anxiety-reduction techniques (such as tell-show-do and paced breathing) used when preparing medically compromised patients for dental procedures.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Ethical Consideration	Discuss ethical dilemmas encountered in pain management for patients with liver disease and explain the rationale for an appropriate,	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE

	justified prescribing decision			
Reflective Practice	Describe communication and professionalism challenges encountered in clinical practice and outline a monthly goal to improve one specific aspect.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Principles of Patient-Centered Communication	Explain principles of patient-centred communication and shared decision-making.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Application of Patient-Centered Care	Explain the principles of patient-centred communication and shared decision-making in the management of individuals with hepatic disease.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
Interdisciplinary Coordination and Continuity of Care	Explain the process of coordinating referrals and follow-up with hepatology services using structured communication templates and shared electronic records.	SGD (Tutorial Room)	C2	MCQs, OSPE, OSCE
Patient Education and Health Literacy in Dental Practice	Explain strategies for providing patient education on prevention and postoperative care using clear, literacy-appropriate written and verbal instructions.	LGIS (Lecture Hall 2)	C2	MCQs, OSPE, OSCE
BIOCHEMISTRY				
Topic	Specific Learning Outcomes	Teaching	Levels	Assessment

		Strategy	C/P/A	
Estimation of Blood Urea	Estimate blood urea levels using standard biochemical methods and interpret results in relation to renal function.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE

Estimation of Serum Creatinine	Estimate serum creatinine concentration and interpret findings to assess glomerular filtration efficiency.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Estimation of Total and Direct Bilirubin	Estimate total and direct serum bilirubin and interpret values to differentiate between hemolytic, hepatic, and obstructive jaundice.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE

PHARMACOLOGY & THERAPEUTICS

Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
Principles and Guidelines Prescription Writing	Demonstrate correct prescription writing by accurately completing all components	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Dose Adjustment Strategy in Renal and Hepatic	Perform dose calculations for medications requiring adjustment in renal and hepatic impairment	LGIS (Lecture Hall 2)		MCQs, OSPE, OSCE

Impairment				
PATHOLOGY				
Topic	Specific Learning Outcomes	Teaching Strategy	Levels C/P/A	Assessment
LFTs	Interpret common liver function tests (bilirubin, ALT, AST, GGT, ALP, bilirubin, albumin, PT/INR) in relation to hepatic structure and function.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
RFTs	Interpret renal function tests (urea, their normal range	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Pigment Deposition – Bilirubin and Porphyrin	Identify and distinguish bilirubin and porphyrin pigment deposits on virtual € slides.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Metabolic Pigmentation Disorders	Recognize histopathological features of common fungal and viral infections in oral biopsy slides.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Fungal and Viral Infections in Oral Tissues	Identify pigmentation patterns seen in ochronosis, porphyria, and hemochromatosis.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE
Lipid Storage Disorders (Xanthomas	Identify lipid-laden macrophages characteristic of xanthomas in histological sections.	LGIS (Lecture Hall 2)	C3	MCQs, OSPE, OSCE

PRISME

Sr. No.	Domain	Learning Outcomes
1.	Professionalism	<ul style="list-style-type: none"> • Demonstrate respect, integrity, accountability in group/clinical tasks/social media. • Apply professionalism in simulated patient interactions • Write structured reflections on professional experiences • Demonstrate patient-centered communication in structured interviews <p>Discuss simple ethical dilemmas</p>
2.	Research	<ul style="list-style-type: none"> • Formulate research questions (PICO/PECO) • Select an appropriate research title • Develop basic literature search strategy (databases, keywords) • Conduct literature search in PubMed/Google Scholar • Summarize research findings using a literature matrix • Explain purpose and steps of a literature review • Conduct a simple literature review on a selected topic
3.	Informatics	<ul style="list-style-type: none"> • Search academic databases & journals online • Use Word advanced features & Excel basics
4.	Social Responsibility	<ul style="list-style-type: none"> • Practice communication skills with culturally diverse patients through role play • Apply ethical principles in case-based discussions Describe basics of patient rights and informed consent
5.	Evidence Based Dentistry	Describe and differentiate levels/types of evidence (systematic reviews, RCTs, cohort, case reports) and strengths/limitations

CFR-C

Sr. No.	CFR-C	Teaching Strategy	Levels C/P/A	Assessment
1.	Interpretation of baseline reports	SGD (Skills Lab)	C3/P	OSPE/OSCE
2.	Interpretation of coagulation profile	SGD (Skills Lab)	C3/P	OSPE/OSCE
3.	Patient Centered Communication	SGD (Skills Lab)	C3/P	OSPE/OSCE
4.	Communication in non-stigmatizing language	SGD (Skills Lab)	C3/P	OSPE/OSCE
5.	Empathy & emotional intelligence	SGD (Skills Lab)	C1/P	OSPE/OSCE

ASSESSMENT POLICY

BLOCK-IV							
Sr. No.	Theory		Practical				Total
1-	Craniofacial III	40 MCQs	120 Marks	Practical Clinical Examination	06 OSPE (9 marks each)	06 Stations x 9 = 54 Marks	300 Marks
2-	Occlusion II	45 MCQs			02 OSCE (9 marks each)	02 Stations x 9 = 18 Marks	
3-	Hepatorenal	35 MCQs			08 OSVE (01 station - PRISME) (6 marks each)	08 Stations x 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

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
- 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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