STUDY GUIDE

College of Dentistry, Lahore Medical & Dental College

Oral Biology Curriculum (2023)

LAHORE
MEDICAL & DENTAL
COLLEGE

Course Director:

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Contributors:

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INTRODUCTION:

Oral Biology and Tooth Morphology is a basic dental sciences course taught during first-year BDS.

The subject deals with the development, gross and histological structure, functions and interactions of oral and craniofacial tissues. It is aimed at introducing the students to the normal structures and function of the oral cavity as well as to be able to recognize the developmental anomalies that often occur. This is the bridging course between basic medical science and clinical dentistry.

The subject of Oral Biology and Tooth Morphology includes the following main topics taught in collaboration with Anatomy and Physiology Departments.

- Oral and Developmental Histology
- Tooth Morphology and Occlusion
- Oral Physiology
- General and Orofacial Embryology
- Oral Anatomy

At the end of the year, graduates are expected to gain a broad appreciation of the development, anatomy, structure, function and morphology of hard and soft tissues of the oral cavity as well as be able to correlate this basic theoretical knowledge with its clinical implications and relations.

SCOPE & SEQUENCE:

The scope of Oral Biology includes a range of basic and applied sciences that helps in the practice of dentistry. These subjects include: Oral and Dental anatomy, craniofacial and dental development, oral physiology and tooth morphology.

CURRICULUM

OBJECTIVES:

Upon the completion of Oral Biology course learners should be able to:

1. Define basic concepts of oral biology.

2. Explain in detail the anatomical and histological structure and function of the tissues in the oral cavity and adjoining areas.

3. Give a detailed presentation of normal development and anatomy, and the histological structure of teeth, the supporting tissues, oral mucosa in different parts of the oral cavity, salivary glands and adjoining tissues and temporomandibular joint as well as normal nerve and vascular supply for teeth and periodontium.

4. Have detailed knowledge on the timetable for the development and eruption of deciduous and permanent dentitions.

5. Describe macro and micro anatomy of the teeth.

6. Select the appropriate tooth identification system needed in any dental practice.

7. Define the anatomical landmarks of the crowns of teeth

ENAMEL

Total Time Allocation for Theory Hours: 4.5

Total Lectures: 6

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 7.27%

Topic	SEQS	MCQS	OSPE
Enamel	1	3	1

K=Knowledge, S= Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material
Intellectual skill **Enamel** By the end of unit on Development of tooth and its Supporting Structures. Learners will be able to 1- Give the composition of enamel and describe the structure of enamel.	✓			-Lect. -Learning projects -Reading -problem solving exercise -3 D Model	SEQs MCQs	Dr. Asad Mahmood	Chap7 Page141-190
2- Explain the different stages of amelogenesis							
3-Enumerate different enamel proteins and their role in enamel formation.							

4-Define and explainStriae of retzius, Cross striations, Bands of hunter and schreger, Gnarled enamel, Enamel tufts and lamellae, DentinoEnamel junction and enamel spindles, enamel surface and rod interrod relationships.							
5- Indicate the age related changes which occur in enamel and defects of amelogenesis							
6-Define and explain Fluoridation and acid etching							
<u>Practical skill:</u> Learners will be able to 1-Draw and label the histological slides of The various functional stages in the life cycle of ameloblasts as would occur in human tooth, Enamel matrix formation, Schematic representation of the organization of secretory stage ameloblasts In a section along their long axis.		√		Laboratory Histological identification sessions, including sketching	Drawing and labeling of Histological slides OSPE		

2-Assess the capacity for observation, analysis and interpretation of, histological slides of bud stage of tooth development, cap stage of tooth development , early bell stage of tooth development, bell stage of tooth development, Beginning of histodifferentiation within the enamel organ, Fragmentation of the root sheath and initial formation of cementum and photomicrographs summarizing root formation		√					

DEVELOPMENT OF TOOTH AND ITS SUPPORTING STRUCTURES

Total Time Allocation for Theory Hours: 4.5

Total Number of Lectures: 6

Lecture time: 45 minutes.

Weightage of Assessment in the Syllabus: 7.27%

Topic	SEQS	MCQS	OSPE
Development of Tooth and its Supporting Structures	1	3	1

K=Knowledge, S=Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading material

Intellectual skill **Development of tooth and its Supporting Structures**. By the end of unit on Development of tooth and its Supporting Structures. Learners will be able to 1-Define and explain Primary epithelial band, Dental lamina, Vestibular lamina, Enamel knot, dental papilla, dental follicle and hard tissue formation 2-Describe different stages of tooth development which include Bud stage Cap stage Bell stage 3-Explain the role of Hertwig's epithelial root sheath in root formation. 4- Describe the process of the formation of supporting tissues **Practical skill:** Learners will be able to 1-Draw and label the histological slides of Bud stage of tooth development Cap stage of tooth development Bell stage of tooth development	✓	√		-Lect. - Learning projects - Reading - problem solving exercise 3D Models	SEQs MCQs Drawing and labeling of Histological slides	Dr. Asad Mahmood	Chapter 5 Page 79-107

Root formation **2-**Analyze the ability for observation and interpretation of , histological slides of bud stage of tooth development, cap stage of tooth development , early bell stage of tooth development, bell stage of tooth development, Beginning of histodifferentiation within the enamel organ, Fragmentation of the root sheath and initial formation of cementum and photomicrographs summarizing root formation.		√		Laboratory and histological identification sessions, including sketching	OSPE		

DENTIN-PULP COMPLEX

Total Time Allocation for Theory Hours: 4.5

Total Number of Lectures: 6

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 10.90%

Topic	**SEQS**	**MCQS**	**OSPE**
Dentin-Pulp Complex	2	4	1

K=Knowledge, S= Skill, A=Attitude

Learning Outcomes (LO)	**K**	**S**	**A**	**MIT**	**Mode of Assessment**	**Facilitator**	**Reading Material**
						Dr.Asad Mahmood	Chap8

							Page191-238
Intellectual Skill **Dentin-Pulp Complex** by the end of unit on Dentin-Pulp Complex, learners will be able to 1- Give the physical & chemical properties of dentine. 2-Describe the Types of Dentin and their pattern of formation. 3-Explain the process of Dentinogenesis along with a labeled diagram. 4-Define and explain Peritubular Dentin, Incremental Growth lines, Interglobulardentin, Granular layer of Tomes, Patterns of Mineralization in Dentin. 5-Explain the innervations of dentin-pulp complex & its clinical considerations. 6-Explain the theories of Dentin Hypersensitivity along with a labeled diagram.	✓			- Lect. - Learning projects - Reading - problem solving exercise -3 D Model	SEQs MCQs		

7-Draw and explain the Zones of Pulp. 8- Describe the different types of cells present in the dental pulp. 9- Write a note on Pulp Stones and Age changes seen in the dentin-pulp complex. **Practical skill:** Learners will be able to: 1-Draw and label the histological slides of the distribution of different types of Dentin along the tooth surface, Formation of Dentin during the Bell Stage of Tooth Development, Schematic representation of theories of Dentin Hypersensitivity, Zones of the Pulp. 2-Analyze the ability for observation and interpretation of histological slides of Dentin formation,		√ √		Laboratory Histological identification sessions, including sket	Drawing and labeling of Histological slides OSPE		

Peritubular, Interglobular, Intertubular dentin.				chin g			

PERIODONTIUM

Total Time Allocation for Theory Hours: 3.75

Total Number of Lectures: 5

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 6.36%

Topic	SEQS	MCQS	OSPE
Periodontium	1	3	1

K=Knowledge, S= Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessmen t	Facilitator	Reading Material
						Dr.Asad Mahmood	Chap 239-267

Intellectual skill **Periodontium** By the end of unit on Periodontium, learners will be able to 1- Define and enumerate the components of periodontium: Cementum, Periodontal ligament, Gingiva, Cementoenamel junction, Sharpey's fibers, Cementoid, Cementodentinal junction, Hypercementosis, Ankylosis, Cementicles, Lamina dura, Bundle bone, Attached gingiva, Free gingiva, Gingival sulcus, Junctional epithelium, Sulcular epithelium, Dentogingival junction, Col 2- Describe physical properties of cementum in terms of hardness, location, thickness, function, vascularity, innervation, types, formative cells and permeability along with the chemical composition of cementum in %age (inorganic and organic including names of cells, types of collagen fibers and non-collagenous proteins).	✓			-Lect. - Learning projects - Reading - problem solving exercise -3 D Model	SEQs MCQs		

3- Classify cementum in terms of presence or absence of cells, origin of collagen fibers (extrinsic and intrinsic) and combination of both 4- Describe the four cementum types (primary, secondary, mixed and acellular) in terms of cells, origin of fibers, location, function, formation/development and mineralization 5- Classify cementoenamel junction in terms of enamel and cementum overlapping. Also discuss clinical significance 6- Describe histological appearance and significance of cementodentinal junction 7- Discuss age related changes occurring in cementum in terms of appearance, thickness, cementicles and repair process 8- Describe periodontal ligament development, location, average width, content (names of cells, types of collagen fibers, elastic and reticular fibers, ground substance) function, remodeling and age changes							

9- Enumerate and draw the five principal fiber bundles of periodontal ligament 10- Describe blood supply of periodontal ligament in terms of names of blood vessels, branching pattern, routes, plexus location, diameter, difference in vascularity of anterior vs posterior teeth, mandible vs maxillary teeth. 11- Explain the nerve supply of periodontal ligament in terms of names of nerves, types of nerve fibers, location and branching. 12- Discuss histological changes seen in supporting system of tooth in increased or decreased function load							
Practical skill: Learners will be able to: 1- Identify and draw histological pictures of different types of cementum in images/slides of ground section of tooth 2- Identify in images/histological slides, draw and label, and also describe the		√ √		Laboratory Histological identification sessions,	Drawing and labeling of Histological slides		

location, direction/orientation, origin, insertion and function of principal fibers of periodontal ligament 3- Identify in images/ patients gingiva, free gingiva, attached gingiva, col, interdental gingiva				including sketching	OSPE		

ORAL MUCOSA

Total Time Allocation for Theory Hours: 4.5

Total Number of Lectures: 6

Lecture Time: 45 minutes.

Weightage of Assessments in the Syllabus: 7.27%

Topic	SEQS	MCQS	OSPE
Oral Mucosa	1	3	1

K=Knowledge, S=Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material
Intellectual skill **Oral Mucosa** By the end of unit on ORAL MUCOSA, learners will be able to 1- Define Oral mucosa, Vermillion border, Vermillion zone, Vestibule, Mucogingival	✓			-Lect. - Learning projects - Reading - problem	SEQs MCQs	Dr. Asad Mahmood	Chap12 Page319-357

junction, Mucocutaneous junction, Submucosa. 2- Describe boundaries, appearance, texture, histology, functions, age changes, blood supply and nerve supply of oral mucosa. 3- Classify oral mucosa according to location and function (masticatory mucosa, lining mucosa, specialized mucosa). 4- Describe histological features of lamina propria (papillary layer, reticular layers, cells, fibers, ground substance, blood vessels, and nerves). 5- Tabulate histological differences between keratinized and non-keratinized oral epithelium in terms of name of cell layers, cell shapes, nucleus size and location. 6- Discuss location, shape, covering epithelium and function of tongue papillae (fungiform, filliform, circumvallate papillae). 7- Discuss and identify histological features (shape, size, type of cells), location and function of taste bud				solving exercise -3 D Model			

8- Define Fordyce spot, Linea alba, Odland body, Keratohyaline granules, Orthokeratinization, Parakeratinization, Acanthosis, Acantholysis, Hyperkeratosis, Keratinocytes, Non-keratinocyte, Melanosomes, Melanophage. 9- Describe location, shape, size and significance of Odland bodies/Membrane coating granules/Lamellar bodies in keratinized and non-keratinized epithelium. 10- Describe location, shape, and size of keratohyaline granules in keratinized and non-keratinized epithelium. 11- Describe and identify histological features and functions of non-keratinocyte in oral epithelium (melanocytes, langerhans , merkel , inflammatory cells) in terms of shape of cell, origin and location 12- Describe exogenous and endogenous pigmentation in oral cavity with examples (Amalgam tattoo, Burton line).					Drawing and labeling of Histological slides		

Practical skill: Learners will be able to: 1- Draw and label anatomic locations occupied by the three main types of mucosa in the oral cavity. 2- Draw and label the main tissue components of the oral mucosa. 3- Draw and label histological diagram of Orthokeratinized and Parakeratinized gingiva. 4- Draw and label the Principal structural features of epithelial cells in successive layers of Non-Keratinized and Orthokeratinized epithelium. 5- Draw and label histological sections of three types of lingual papillae. 6- Draw and label histology of taste bud . 7- Identify (in images/pictures/slides) oral mucosa according to location and function (masticatory mucosa, lining mucosa, specialized mucosa) 8- Identify in histological pictures/images keratinized and non-keratinized epithelium.		√ √		Laboratory Histological identification sessions, including sketching	OSPE		

9- Identify tongue papillae in histological slides/images. 10- Identify fordyce's granules in pictures/images. 11- Identify on patients/images junctions in oral cavity (mucogingival, dentogingival, mucocutaneous)							

SALIVARY GLANDS

Total Time Allocation for Theory Hours: 3.75

Total Number of Lectures: 5

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 6.36%

Topic	SEQS	MCQS	OSPE
Salivary Glands	1	3	1

K=Knowledge, S= Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material
Intellectual skill **Salivary Glands** by the end of unit on salivary glands, learners will be able to 1- Define saliva, Acini, Myoepithelial cell, Pellicle, Major salivary glands, Minor salivary glands.	✓			-Lect. - Learning projects - Reading	SEQs MCQs	Dr. Momina Khalid	Chap11 Page290-318

2- Describe development, histological structure (of acini and ductal system (e.g. staining, shape of acini, number of secretory cells per acini, shape of secretory cells, shape location and size of nucleus, location of cell organelles, lumen size, granules, serous demilunes, etc.) 3- Explain the gross anatomy of major and minor salivary glands (location, size, number, name and opening of ducts, nerve supply and blood supply). 4-Tabulate the functions of saliva along with its corresponding effect and active constituent. 5- Describe myoepithelial cells in terms of location, histological appearance (shape, processes) and function. 6- Classify ductal system of salivary glands. 7- Define Sialolith, Mucocele, Sialadentits, Sjorgen syndrome, Primary saliva, Secondary saliva. 8- Describe process of ductal modification and regulation of primary and secondary saliva in terms of secretion/reabsorption of electrolytes at different flow rates. 9- Describe histological and functional changes in salivary glands due to aging.				- proble m solving exercis e -3 D Model			

10- Enlist local and systemic diseases effecting salivary glands anatomy and function (ductal blockage, autoimmune diseases, bacterial and viral infections, trauma, diabetes, cysts, fibrosis, dry mouth). **Practical skill:** Learners will be able to: 1- Identify, on histological slides/images, serous, mucous and mixed salivary glands. 2- Draw and label anatomy of salivary glands, purely serous, mucous and mixed glands, ductal system of a salivary gland. 3- Analyze the ability for observation and interpretation of histological slides of serous, mucous and mixed salivary glands, myoepithelial cell, minor salivary glands.		√ √		Laboratory Histological identification sessions, including sketching	Drawing and labeling of Histological slides OSPE		

BONE

Total Time Allocation for Theory Hours: 3.75

Total Lectures: 5

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 6.36%

Topic	SEQS	MCQS	OSPE
Bone	1	3	1

K=Knowledge, S=Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material
Intellectual skill **Bone** By the end of unit on BONE, learners will be able to 1- Describe the composition and histology of compact and trabacularbone. 2- Write notes on bone cells; Osteoblasts, Osteoclasts and Osteocytes. 3- Explain the three types of Bone development; Endochondral, Intramembraneous and Sutural. 4-Describe the process of Bone Remodeling along with a labeled diagram.	✓			Lect. -Learning projects -Reading -problem solving exercise -3 D Model	SEQs MCQs	Dr. Momina Khalid	Chap6 Page 108-140

Practical skill: Learners will be able to 1-Draw and label the histological slides of 2-Analyze the ability for observation and interpretation the histological slides of the structure of different types of bone, Schematic diagram of Organizational Components of bone, bone formation and Bone Remodeling.		√ √			Drawing and labeling of Histological slides OSPE		

TEMPOROMANDIBULAR JOINT

Total Time Allocation for Theory Hours: 3.75

Total Number of Lectures: 5

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 6.36%

TOPIC	SEQS	MCQS	OSPE
Temporomandibular Joint	1	3	1

K=Knowledge, S=Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material

Intellectual skill **Temporomandibular Joint** by the end of unit on TEMPOROMANDIBULAR JOINT, learners will be able to 1- Classify joints (Fibrous, cartilaginous, synovial). 2- Define Temporomandibular joint, Bilaminar zone, Synovial membrane, Capsule. 3- Describe TMJ in terms of its gross anatomy, components, biomechanics (also including origin, insertion and action of muscles of mastication), blood supply and innervation. 4- Describe temporomandibular joint in terms of its development, histology of its components, nerve endings (location and function) and clinical significance (dislocation, ankylosis, arthritis, articular disk displacement, TMJ Dysfunction). 5- Describe articular disk in terms of its shape, location, histology (fiber types and their orientation/arrangement, types of ground substance and cells) location, function, vascularity, innervation, anterior and posterior	✓				SEQs MCQs	Dr Asad Mahmood	Chap13 Pg 358-378

bands/laminae along with their attachment. 6- Describe histology, attachment, appearance, vascularity, innervation and function of joint capsule Describe location, extent, function, appearance, histology of synovial membrane (cellular intima and sub intima). 7- Describe formation, appearance, consistency, composition and function of synovial fluid **Practical skill:** Learners will be able to: 1- Draw and label Temporomandibular joint showing its different components. 2- Identify, draw and label cellular intima and subintima of synovial membrane. 3- Draw and label the muscles of mastication. 4- Identify and label a histological section through the TMJ illustrating the		√			Drawing and labeling of Histological slides OSPE		

relationship between the temporal bone, the articular disc and the head of condyle. 5- Identify and label Temporomandibular joint showing its different components.							

PHYSIOLOGIC TOOTH MOVEMENT: TOOTH ERUPTION AND SHEDDING

Total Time Allocation for Theory Hours: 3.75

Total Number of Lectures: 5

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 6.36%

Topic	SEQS	MCQS	OSPE
Physiologic Tooth Movement: Tooth Eruption and Shedding	1	3	1

K=Knowledge, S=Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material
Intellectual skill **Tooth Eruption and Shedding** by the end of unit on Tooth Eruption and shedding, learners will be able to 1- Define Eruption, Shedding, Pre-eruptive tooth movement, Eruptive tooth movement, Post eruptive tooth movement, Active	✓			-Lect. -Learning projects -Reading -problem solving exercise -3 D Model	SEQs MCQs	Dr. Asad Mahmood	Chap10 Page268-289

eruption, Passive eruption, Gubernacular cord, Gubernacular canal, Natal teeth, Neo natal teeth. 2- Differentiate the three types of physiological tooth movements (pre-eruptive, eruptive and post eruptive) in terms of direction of movement, movement in µm, need and significance. 3- Discuss mechanism and factors responsible for eruptive tooth movement. 4- Describe the three types of movement a tooth makes post eruption to maintain its functional position in the jaw in terms of mechanism and significance. 5- Discuss histology and causes of tooth shedding. 6- Enlist local and systemic causes of premature and delayed eruption of teeth. **Practical skill:** Learners will be able to: 1- Draw and label a histological section of Gubernacular		√		Laboratory Histological identification sessions, including sketching	Drawing and labeling of Histological slides OSPE		

canal and its constituents. 2- Identify in images/slides histological section showing union of oral epithelium and reduced enamel epithelium during tooth eruption through soft tissue corresponding effect and active constituent. 3- Identify in images/slides the Gubernacular cord.		√					

EMBRYOLOGY OF THE HEAD, FACE AND ORAL CAVITY

Total Time Allocation for Theory Hours: 3.75

Total Number of Lectures: 5

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 6.36%

Topic	SEQS	MCQS	OSPE
Embryology of the Head, Face and Oral Cavity.	1	3	1

K=Knowledge, S=Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material
Intellectual skill **Embryology of the Head, Face and Oral Cavity** by the end of unit on embryology of the head, face	✓			-Lect. -Learning projects -Reading -problem solving exercise	SEQS MCQS	Dr. Asad Mahmood	Chap3 Page32-56

and oral cavity, learners will be able to 1- State the Derivatives of the Branchial (pharyngeal) Arch System along with their vascular and neural components. 2- Describe sequence of developmental changes occurring in maxillary and mandibular processes in areas of future dental arches during 6^{th}& 7^{th} weeks of intra uterine life. 3- Describe and identify development of face in terms of processes involved and their role in formation of lips, nose, forehead, cheeks and jaws. 4- Explain the formation of secondary palate with the help of a labeled diagram. 5- Write a note on the prenatal development and post-natal growth of maxilla. 6- Explain the role of Meckel's cartilage in the development and growth of the Mandible. 7- Discuss how facial clefts are formed and what may be the causative factors behind it. Mention all types of facial clefts along with their				-3 D Model			

Respective processes involved. 8- Local proliferation of the mesenchyme gives rise to a number of swellings in the floor of the mouth during development. Name the swellings along with their role in Tongue Development. Also mention the innervation of Tongue. **Practical skill:** Learners will be able to: 1- Identify in pictures/images developmental anomalies associated with incomplete fusion of facial processes (unilateral, bilateral and median cleft lip, oblique facial cleft, median cleft/frontonasal dysplasia, lateral facial cleft, and mandibular cleft). 2- Identify development of primary and secondary palate in terms of time frame, processes involved, fusion of shelves and associated anomalies (cleft palate and its types) 3- Draw and label and identify in images/models both developing and mature mandible bone		√ √		Laboratory Histological identification sessions, including sketching	Drawing and labeling of Histological slides OSPE		

TOOTH MORPHOLOGY

Total Time Allocation for Theory Hours: 20.25

Total Number of Lectures: 27

Lecture Time: 45 minutes.

Weightage of Assessment in the Syllabus: 31.63%

Topic	SEQS	MCQS	OSPE
Tooth Morphology	4	14	2

K=Knowledge, S= Skill, A=Attitude

Learning Outcomes (LO)	K	S	A	MIT	Mode of Assessment	Facilitator	Reading Material
Intellectual skill **Tooth Morphology** by the end of the module of Tooth Morphology, learners will be able to 1- Define and explain dental formula, and eruption time of permanent and deciduous dentition. 2- Explain different numbering systems used for deciduous and permanent dentition. 3- Define following terms curve of spee, curve of Wilson, line angle, point angle and curve of monsoon. 4-Describe the occlusal, incisal, palatal, buccal mesial and distal surfaces	✓			-Lect. -Learning projects -problem solving exercise -3 D Model	SEQs MCQs	Dr. Sikander Bajwa	Chap1-11

of permanent and deciduous Incisors caninesmolars and permanent premolars. **Practical skill:** Learners will be able to 1-Draw and label the histological slides of 2- Draw and label the occlusal aspects of permanent premolars and molar. 3- Draw and label the lingual and buccal aspects of maxillary and mandibular incisors and canines. 4-Analyze the ability for observation and interpretation t of diagrams of permanent and deciduous teeth.		√ √		Laboratory Histological identification sessions, including sketching	Drawing and labeling of Histological slides OSPE		

TUTORIALS

Lab Exercise /Practical of Oral Biology and Tooth Morphology	**Facilitators**
Journals of oral histology and tooth morphology with Draw and Label exercises of relevant topics along with model demonstration of tooth morphology	Dr. Momina Khalid Dr. Fatima Ikram Dr. Ali Tahir Dr. Asma Ali

LIST OF PUBLICATIONS ORAL BIOLOGY DEPARTMENT

Dr. Asad Mahmood					
Sr. No.	**Name of author**	**Title of the publication**	**Complete address of the journal and address with ISSN (Print no.)**	**Volume No. and Page No.**	**Year published**
1	**Asad Mahmood,** Mohammed Mneimne, Li Fong Zou, Robert G. Hill, & David G. Gillam	Abrasive wear of enamel by bioactive glass-based toothpastes	American Journal of Dentistry,	Vol. 27, No. 5, October, pp.263-267	2014
2	Sikandar Javed Bajwa, Muhammad Qasim, **Asad Mahmood**	The impact of dentine hypersensitivity on patient's quality of life as perceived by dentists	Pakistan Orthodontic Journal	Vol9(2) pp.98-102	2017
3	Sikandar Javed Bajwa, Malik Arshman Khan, **Asad Mehmood,** Mamman Fayyaz	Determining the thermal behaviour of bioactive glasses by using differential scanning calorimetry.	Pakistan Journal of Medical and Health sciences ISSN 1996-7195	Vol 12, No. 4, pp.1389-1391.	2018
4	Muhammad Waheed Tahir, **Asad Mahmood**, Anum Abid, Muhammad Saad Ullah, Mustafa Sajid	Knowledge, attitude and practices of cross infection control among Dental Students of Punjab Pakistan	Pakistan Journal of Medical and Health sciences ISSN 1996-7195	Vol. 12, No. 1, Jan – Mar pp.238-242	2018
5	**Asad Mahmood**, Muhammad Waheed Tahir, Anum Abid, Muhammad Saad Ullah,	Knowledge of Drug Prescription in Dental Students of Punjab Pakistan	Pakistan Journal of Medical and Health sciences ISSN 1996-7195	Vol. 12, No. 1, Jan-Mar, pp. 232-238	2018

	Mustafa Sajjid.				
6	**Asad Mahmood,** Mustafa Sajid, Muhammad Jamil, Muhammad Waheed Tahir	Frequency of Palato Gingival Groove in Maxillary Lateral Incisors.	The Professional Medical Journal	Vol26(4): pp.559-562.	2019
7	Mohsin Javaid, Muhammad Jamil, Muhammad Saadullah, Ehsan Haider, Mustafa Sajid, **Asad Mahmood**	Knowledge, Attitude & Practice Regarding Use of Personal Protective Equipment among Dental Assistants working at Multan Medical and Dental College Multan, Pakistan	Pakistan Journal of Medical and Health sciences ISSN 1996-7195	Vol. 13, No. 3, Jul – Sep pp.623-626	2019
8	Abdul Muqeet, Amber Shami, **Asad Mahmood,** Muhammad Saadullah, Sharina Naz, Mustafa Sajid	Assessment of Distance between Glenoid Fossa and Condyle in the Coronal Plane Using Cone-Beam Computed Tomography in Pakistani Population	Pakistan Journal of Medical & Health Sciences (PJMHS) ISSN 1996-7195	Vol. 14, No. 4, Oct-Dec pp.826-828	2020
9	Tamsila Malik, Tahreem Malik, **Asad Mahmood,** Sharina Naz, Mustafa Sajid	Choice of Matrix System for Class II Composite Restoration; a Cross Sectional Survey among the Dentists of Multan Dental College	Pakistan Journal of Medical & Health Sciences (PJMHS) ISSN 1996-7195	Vol. 14, No. 4, Oct-Dec pp.829 - 830.	2020
10	Asif Noor, Javeria Afzal, **Asad Mahmood**, Mawra Hyder, Mustafa Sajid, Muhammad Jamil	Effectiveness of Mineral Trioxide Aggregate (MTA) as Direct Pulp Capping Agent in Mandibular Molars	Pakistan Journal of Medical & Health Sciences (PJMHS) ISSN 1996-7195	Vol. 15, No. 1, January pp.120-122	2021

11	Rabia Zafar, Mustafa Sajid, **Asad Mahmood,** Saadullah, Muhammad Waheed Tahir, Salman Aziz	Frequency of Early Child Hood Caries and Associated Risk Factors in patients attending a private hospital in Southern Punjab	Pakistan Journal of Medical & Health Sciences (PJMHS) ISSN 1996-7195	Vol. 15, No. 1, January pp.123-125	2021
12	Rafia Sartaj, Nousheen Khan, **Asad Mahmood**, Asif Noor, Mustafa Sajid, Jamil	Perception of Students and House Officers for Restoration of Endodonticaly Treated Anterior Teeth: A Question Based Study	Pakistan Journal of Medical & Health Sciences (PJMHS) ISSN 1996-7195	P J M H S Vol. 15, NO. 6, June pp.1317 - 1320	2021
13	Haider E, Hassan S, Mehmood R, Dayar J, **Mahmood A**, Ali F, Khan H.	Attitude of Final Year Students towards Dental Specialty, Subject Preference and Factors influencing their decision	Pakistan Journal of Medical & Healtth Sciences (PJMHS) ISSN 1996-7195	Vol. 15, No. 7, Jul pp.1623-1625	2021
14	Muhammad Ahmad, Saira Javaid, Muhammad Saad Ullah, **Asad Mahmood**, Muhammad Mohsin Javaid, Rabia Mahmood	Status of Vaccination against Hepatitis B Virus among Medical Students of a Private Medical Institute in Multan	Pakistan Journal of Medical & Health Sciences (PJMHS) ISSN 1996-7195	Vol. 15, No. 4, April pp. 703-705	2021
15	Abdul Muqeet, Riwad Noor, **Asad Mahmood**, Abdul Wahab, Muhammad Jamil, Mustafa Sajid6	Vaccination Status against Hepatitis B Virus among House Officers of a Private Dental Institute/College in Multan	Pakistan Journal of Medical & Health Sciences (PJMHS) ISSN 1996-7195	Vol. 15, No. 1, January pp. 117-119	2021

Dr. Sikander Javed					
1.	**Sikandar Javed Bajwa**	The impact of dentine hypersensitivity on patients' quality of life as perceived by dentists	Pakistan Orthodontic Journal;	Vol. 9 (2) pp. 98 – 102.	2017
2.	**Sikandar Javed Bajwa**	Assessing awareness and knowledge of oral cancer among adult dental patients in Lahore pakistan.	Medical Forum ISSN:2519-7134	Vol. 29, No. 27, pp. 7-11.	2018
3.	**Sikandar Javed Bajwa**	Use of inductive couple plasma mass spectroscopy to analyze the properties of ions released by bioactive glasses and bone scaffolds.	Pakistan Journal of Medical and Health sciences ISSN:1996-7195	Vol.12, No. 1, pp. 2-6.	2018
4.	**Sikandar Javed Bajwa**	Effect of smokeless tobacco and areca nut chewing among adults in Gulyana village.	Pakistan Journal of Medical And Health sciences ISSN 1996-7195	Vol 12, No. 3, pp.946 - 949.	2018
5.	**Sikandar Javed Bajwa**	Determining the thermal behaviour of bioactive glasses by using differential scanning calorimetry.	Pakistan Journal Of Medical And Health	Vol 12, No. 4, pp.1389-1391.	2018

			sciences ISSN 1996-7195		
6.	**Sikandar Javed Bajwa**	Assessing the level of happiness among dental students of Pakistan: Web-based study	Pakistan journal of medical and health sciences ISSN 1996-7195	Vol 15, No.7 4, Pp.1629-1632	2021
7.	**Sikandar Javed Bajwa**	Dental anxiety measurement of children in abbottabbad using audio visual system.	Pakistan journal of medical and health sciences ISSN: 1996-7195	Vol 15, No. 7. Pp.1633-1636	2021
8	Beenish Fatima Alam, Madiha Anwar, Kawish Syed, Tabassum Ahsan, **Sikandar Javed Bajwa,** Talib Hussain, Saqib Ali	Assessing relationship between lip prints, finger prints and different blood groups within the population of Karachi	Pakistan Journal of Medical and Health Sciences	Vol no 15, Pg. 2663-2665	2021
9	Syed Abdul Rauf Shah, Shabana Tanveer, Bilal Zaman Babar, Malik Arshman Khan, **Sikandar Javed Bajwa,** Salvan Ghani, Maryam Khurshid	Denture Hygiene Habits among Elderly Patients Wearing Complete Dentures	Pakistan Journal of Medical and Health Sciences	Vol. 15, No.10	2021
10	Malik Arshman Khan, Talib Hussain, Bilal Zaman Babar, **Sikandar Javed Bajwa,** Salvan Ghani, Faiza Gulfam, Afrasiab Khan, Maryam Khurshid, Mamman Fayyaz	Prevalence of Distal Cervical Caries in Mandibular Second Molar caused by impacted third molar	Pakistan Journal of Medical and Health Sciences	Vol. 15, No.12	2021
11	Fiza Shafiq, Abbas Saleem Khan, Sajjad Ahmad, Malik Arshman Khan**, Sikandar Javed Bajwa**, Talib Hussain	Immunoexpression of Matrix Metalloproteinase-9 in Histopathological tissue samples of oral Squamous Cell Carcinoma	Pakistan Journal of Medical and Health Sciences	Vol. 15, No.10	2021
12	**Sikandar Javed Bajwa**	Effect of dental office environment and dentists' attire on children's			

		Cooperation			
13	**Sikandar Javed Bajwa**	Attitudes and knowledge of dentists in Pakistan regarding the use of dental amalgam as a restorative Material			
		Dr. Maliha Shahbaz			
1	Zaheer, N., **Shahbaz, M.,** Athar, Y., Arshad, A.I., Zaheer, U. and Alam, M.K.,	Collagenous Damage in Buccal Mucosa due to Nicotine Exposure and Its Prevention by Green Tea (Camellia Sinensis) Extract.	International Medical Journal ISSN:1341205 1	Vol. 22 (6) pp. 466 – 472.	2015
2.	Shahbaz, M., Zaheer, N., Sagheer, A., Arshad, A.I., Zaheer, U. and Alam, M.K.,	Role of Green tea extract (Camellia Sinensis) in prevention of Nicotine-induced inflammatory and epithelial changes in buccal mucosa of Albino rats.	International Medical Journal ISSN:1341205 1	Vol. 24, No. 2, pp. 230-233.	2017
3.	Zaheer, N., **Shahbaz, M.,** Athar, Y., Arshad, A.I., Zaheer, U. and Alam, M.K.,	Role of Green tea extract (Camellia Sinensis) in prevention of Nicotine-induced vascular changes in buccal mucosa of Albino rats.	International Medical Journal ISSN:1341205 1	Vol.24, No. 1, pp. 120-125.	2017
4.	**Shahbaz, M.,** Zaheer, N., Zaheer, U. and Akhtar, J.	Modulation of TNF-α level on buccal wound healing of Albino rats through cocoa powder extract.	Pakistan Oral & Dental Journal	Vol 38, No. 2, pp. 183-186.	2018
5.	Zaheer, U., Zaheer, N. and **Shahbaz, M.**	Shear bond strength of brackets on bonding to treated amalgam surfaces.	Pakistan Oral & Dental Journal	Vol 38, No. 2, pp.207-210.	2018
6.	**Shahbaz, M.,** Zaheer, N., Zaheer, U., Riaz, A., Chatha, A.A., Waseem, U.	Inflammatory Changes in Buccal Wound Healing of Albino Rats Through Cocoa Powder Extract.	Pakistan Oral & Dental Journal	Vol 38, No. 4.	2018
7.	Zaheer, N., Zainul, A. Bin Rajion, **Shahbaz, M.,** Pauzi, H., Qasim, S. M., Noor H. A. R.	Ultraviolet A and Ultraviolet C Light-Induced Reduction of Surface Hydrocarbons on Titanium Implants.	European Journal of Dentistry ISSN: 1305-7456	Vol 13, No. 1.	2019
8.	Atif, S., Zaheer, N., Qadeer, M., Liaqat, K., **Shahbaz, M.,** Zaheer, U.	Perceptions of Public and Private School Students of Lahore Cantt About Dental Health.	Pakistan Oral & Dental Journal	Vol 39, No. 2	2019
9.	Riaz, A., Zaheer, U., Zaheer, N., Chaudhry N.A., Rahbare M.I., **Shahbaz, M**.	Cephalometric determination of nasal profile in patients presenting at a tertiary care hospital.	Pakistan Orthodontic Journal	Vol 11(2) Page: 71-76.	2019
10.	Waseem, U., **Shahbaz, M.,** Gul, A., Baloch, M.B., Munir, Q.,	Effect of Acacia Catechu on Aspirin Induced Gastric Ulcers in Albino Rats.,	Biomedica	35(3).	2019

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11.	Shahzad, H. B., Awais, F., Shirazi, U. E. R., Majeed, H. A., Rafique, A., & **Shahbaz, M.**	The impact of dental caries on oral health related quality of life amongst adult population in Lahore, Pakistan.,	Makara Journal of Health Research	Vol. 24(1), 1.	2020
12.	Naauman, Z., Zainul, A. bin. Rajion., **Maliha, S.,** Usman, Z., Muhammad, Q.S., Noor, H.A. R.,	Bone density and marginal bone loss around implants post ultraviolet A and ultraviolet C irradiation.	Sains Malaysiana	Vol: 49(6), Page: 1411-1420	2020
13.	Rizwana, K., Attia, B., Nauman, Z., **Maliha, S.,** Kinza, A., Faiqua, Y., Farhat, I., Rana, K. A.	Prevalence of Burnout among Dentists in CMH Lahore Medical College & Institute of Dentistry, Pakistan	Advances in Bioresearch ISSN: 0976-4585	Vol 11 (6): Page: 164-169.	2020
14.	Zaheer, U., Israr, J., Riaz, A., Zaheer, N., **Shahbaz, M.**, & Yaqub, A.	Association between sella turcica bridging, third molar agenesis and impaction.,	Pakistan Orthodontic Journal	Vol: 12(2), Page: 82-89.	2020
15.	Khan, A. S., Zaheer, N., Zaigham, A. M., **Shahbaz, M.,** Zaheer, U., & Alam, M. K	Effect of Platelet-Rich Plasma on Bone Healing in Immediate Implants Analyzed by Cone Beam Computerized Tomography: A Randomized Controlled Trial.	BioMed Research International, ISSN: 2314-6141,2314-6133	2021	2021
16.	Shahzad HB., Awais, F., Raza, NH, Majeed, HA, **Shahbaz, M.**, Kazmi, F.,	Daily Impacts of Missing Teeth in Adult Population in Lahore, Pakistan	JPDA	Jul;30 (03).	2021
17.	Zaheer, N., Rajion, Z. A., **Maliha, S.,** Abdullah, M. A., usman, Z., Muhammad, Q.S.	Ultraviolet A and Ultraviolet C Light-induced effect on titanium implant surface	Acta Microscopia	30 (2):41-48	2021

Dr. Momina Khalid					
1	Asif Iqbal, Fatima Ikram, Mobin Riaz, Momina Khalid, Aman Mansoor, Javeria Iftekhar	Prevalence of Tooth Shade and its Correlation with Skin Colour - A cross-sectional study	PJMHS	16 (9) 68-69	2022
Dr. Fatima Ikram					
1	Asif Iqbal, Fatima Ikram, Mobin Riaz, Momina Khalid, Aman Mansoor, Javeria Iftekhar	Prevalence of Tooth Shade and its Correlation with Skin Colour - A cross-sectional study	PJMHS	16 (9) 68-69	2022

- **Revision classes will be started after completing this course for 2- 3 weeks**
- **Send up will be held in the month of November 2023**

POLICY FOR MISSED ASSIGNMENTS

a) Students have to prove valid reason for missed test and assignments.

b) Students should inform the HOD prior to the date of scheduled examination.

c) Course director has discretionary power to accept reason only if found reasonable.

POLICY FOR MARKING ATTENDANCE

a) Present will be mark for those who will come sharp on time

b) Arrival after 10 minutes will be considered absent

c) Arrival within 10 minutes will be consider late

d) 3 late arrivals will be equal to one absent

EVALUATION

- **Internal Assessment**

· Will be based upon written test, OSPE (observed / unobserved), close book test, presentations, and & assignments and no of credits**.**

· **Written Tests** will be conducted either at the end or in the mid of each course. Tests will consist of multiple-choice questions (MCQs) and short essay questions (SEQs). Summative and formative assessment will be done. Students should discuss their papers with the course director after the display of the result. Also, opportunity will be provided in the class room for full strength.

FINAL (SEND UP) EXAMINATION

Tentative date November 2023

- **Theory Examination:** 3 hours duration

Short essay type (SEQ) & multiple-choice questions (UHS pattern)

- **Viva/Oral Examination**. /**OSPE**

Definitive Schedule will be announced before examination date.

- **Practical Examination**

Will be conducted on the same day as the viva

FINAL PROFESSIONAL UNIVERSITY EXAMINATION: (Total 200 marks)

- Internal Assessment: 20 marks
- Theory. 45 marks. 15 short essay type questions
- Multiple choice question 45 marks
- Viva / Oral Examination & Practical Examination (90 marks)

RECOMMENDED TEXTBOOKS:

1. Ten Cates Oral Histology, 9th Edition

2. Concise Dental Anatomy and Morphology, James Fuller. 5th Edition

3. Wheelers Dental Anatomy, Physiology and Occlusion 11th Edition

REFERENCE BOOKS:

1. Master Dentistry vol 3

Dr. Asad Mahmood

Associate Professor & Head of Department,

Oral Biology