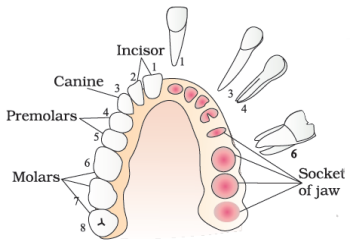
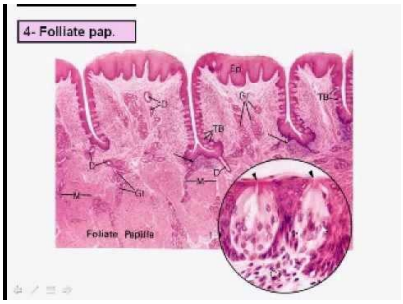
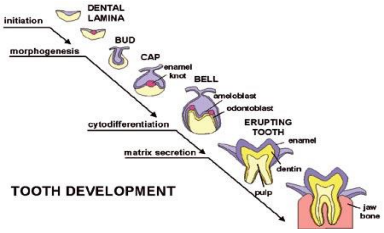
AVICENNA
DENTAL COLLEGE

STUDY GUIDE
OF ORAL BIOLOGY







MESSAGE FROM THE PRINCIPAL

AVICENNA DENTAL COLLEGE

Prof.Dr.Sohail Abbas Khan

{MDS, Dip Op (Hons) BDS}

It is a matter of immense honour and privilege as the first Principal of Avicenna Dental College to welcome you to prospectively one of the finest dental institutes in the private sector of Pakistan. Avicenna Dental College is a private dental college, which aims to provide the finest dental education to dental undergraduate student in accordance with the latest trends in Medical Education, and to develop them to practice dentistry in the 21st century.

While educating dental students to become licensed, empathetic and competent professionals, Avicenna Dental College endeavours to educate students in a supportive environment in which they provide dental care for a diverse populace. In the times to come, we wish to transform our graduates into unfeigned teachers, researchers and consultants by starting post-graduation programs as well.

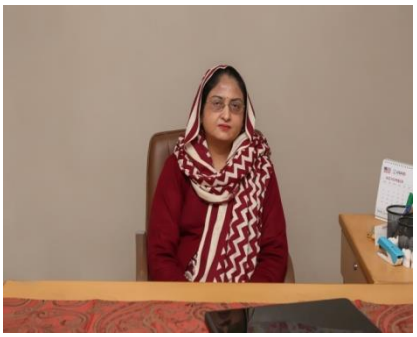
Avicenna Dental College aims to achieve an enterprising curriculum integrating the basic sciences with clinical experience while utilizing modern technological modalities.

In addition to the production of outstanding oral health professionals, we at Avicenna Dental College recognize our responsibility as a private dental institution to the citizens of the country in making the provision of oral the provision of oral health care available to those who are deprived of ready access.

I feel proud to lead this dental establishment such an inspiring time and hope all of you at Avicenna Dental College will share this pride and play your respective roles in materializing the dream of making this institution the premier dental educator in Pakistan.

MESSAGE FROM HOD, ORAL BIOLOGY

AVICENNA DENTAL COLLEGE



DR. RAHEELA YASMEEN

BDS; M-Phil (Oral Biology)

The aim of this department is to educate students in modern scientific approach to Oral biology & Oral diseases. The mission of this department is to provide an encouraging environment to develop the intellectual capacity, critical thinking, creativity and problem-solving ability of the students so that that they may become knowledgeable, contributing & forward-thinking members of the Medical science & Dentistry community. In doing so, department aims to foster a conductive environment for scholarly and creative activities so that new knowledge or solutions to problems are discovered or created, and the students are equipped with the most current advancements and techniques in the Medical and Dental field.

I. Introduction to Study Guide

WHAT IS A STUDY GUIDE?

It is an aid to:

- Inform students how student learning program has been organized according to their learning objectives.
- Help students organize and manage their studies throughout the course.
- Guide students on assessment methods, rules and regulations

THE STUDY GUIDE:

- Communicates information on organization and management of the course. This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of the course.
- Identifies the learning strategies such as lectures, small group teachings, clinical skills, demonstration, tutorial and case-based learning that will be implemented to achieve the course objectives.
- Provides a list of learning resources such as books, computer assisted learning programs, web- links, journals, for students to consult in order to maximize their learning.

STUDENT'S OVERALL PERFORMANCE:

- Includes information on the assessment methods that will be held to determine every student's

ACHIEVEMENT OF OBJECTIVES:

- Focuses on information pertaining to examination policy, rules and regulations.

II. Introduction to Department

Department of Oral Biology & Tooth Morphology AMDC was established in 2016 with the constitution of Dental Section AMDC.

The department;

- Provides a stimulating environment for highly motivated and qualified students to prepare them for a rewarding career in academics.
- Encompass studies of fundamental biological phenomenon related to the development, structure, and function of the craniofacial region.
- Focus on the latest scientific development related to the mouth and oral biology and health offering basic science in a clinical context.
- Build a strong existing foundation and will enhance and further broaden commitment to cutting edge research into the molecular basis of diseases.

Area: The Department occupies 500 square-feet (Oral Biology Laboratory) & 250 square-feet (Oral Biology Departmental Office) on the fourth floor of the Dental college building at Avicenna Dental College.

Activities: The laboratory is fully equipped with microscopes for visualizing histological sections of oral tissues, along with tooth models to further enhance their skills on identification of individual teeth. Laboratory-based education is encouraged to synergize learning to foster passion for excelling in Oral Biology in order to build a successful research career in the future. The lecture delivery takes place in the designated lecture hall on the first floor of the main college while the tutorials and practical sessions take place within the Oral Biology laboratory.

III.GOAL OF ORAL BIOLOGY &TOOTH MORPHOLOGY:

Oral biology & Tooth Morphology comprises of oral histology, embryology, and physiology& tooth morphology.The broad goal of teaching the subject is concerned with the study of the nature of the oral & craniofacial tissues along with the application of basic scientific knowledge of oral tissues in health and diseased state.

It includes the study of embryology, growth and development coupled with details of structure, composition and functions of cells, tissues and organs of the oral cavity. By its nature Oral biology overlaps the Basic Medical Sciences and Clinical Dental Sciences.

The rationale for a distinct program in oral biology is to provide:

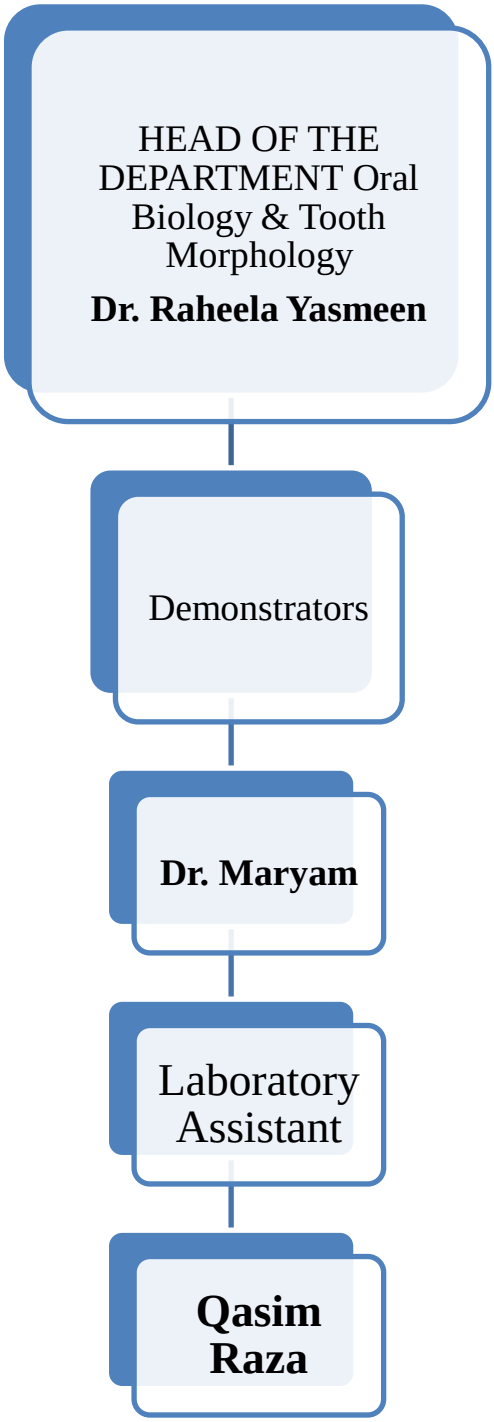
(1) A focus for the traditional basic health sciences, and

(2) A base of oral biological knowledge upon which clinical subjects of the dental curriculum and dental practice can rest.

The Department of Oral Biology & Tooth Morphology at AMDC has an experienced teaching faculty which is challenged to develop new ways to disseminate knowledge that will encourage students to remain lifelong learners. Our diverse teaching faculty and use of innovative teaching strategies such as lectures on multimedia, interactive sessions and educational videos enables us to maintain a comprehensive learning environment. We also conduct assignments and assessments on a periodic basis to evaluate the academic progress of our students.

The laboratory is fully equipped with microscopes for visualizing histological sections of oral tissues, along with tooth models to further enhance their skills on identification of individual teeth. We encourage laboratory-based education to synergize learning and to motivate students to undertake research projects early on in their professional years to foster passion for excelling in their chosen field of specialty in order to build a successful research career in the future.

IV. Faculty Members


HEAD OF THE DEPARTMENT Oral Biology & Tooth Morphology
Dr. Raheela Yasmeen
Demonstrators
Dr. Maryam
Laboratory Assistant
Qasim Raza

i. Curriculum with learning objectives of Oral Biology &Tooth Morphology.

A. ORAL HISTOLOGY INCLUDING ORAL EMBRYOLOGY.

Topic 1: Structure of the Oral Tissues

Contents/ Topics	Outcomes/ Knowledge
1. The Tooth	Describe the basic structure of enamel, dentin & pulp (The tissues which make the bulk of the tooth).
2. Supporting tissues of the tooth	Identify the structure of periodontal ligament & cementum, the tissues which support the tooth.
3. Oral mucosa.	Recognize the basic structure of oral mucosa along with its types and distribution.
4. Salivary glands.	Identify the basic structure of a salivary gland and its types and localization.
5. Bones of the jaw.	Recognize the maxilla and the mandible as bones of the jaw bearing the teeth for the respective arches.
6. Temporomandibular joint.	Describe the joint which allows the mobility of the jaws and the bones and structures which make it up.

Topic 2: General Embryology

Contents/ Topics	Outcomes/ Knowledge
1. Germ Cell Formation and Fertilization	Describe the process of oogenesis &spermogenesis along with the fusion of the two gamete cells resulting in fertilization.

2. Prenatal Development	Identify the various morphological changes taking place in the developing embryo over the course of initial 2 months after fertilization.
3. Induction, Competence, and Differentiation	Define these basic terminologies and their consequent effects on the developing embryo.
4. Formation of the Three-Layered Embryo	Describe in detail the formation of the ectoderm, mesoderm and endoderm in the embryo.
5. Formation of the Neural Tube and Fate of the Germ Layers	Explain the process of the formation of the neural tube via various changes in the developing embryo. Describe the structures which are formed in the embryo through each of the respective germ layer.
6. Folding of the Embryo	Explain the process through which the embryo folds within its axes during development and its significance.
7. The Neural Crest	Describe in detail the location of origin, migration and structure of the neural crest cells. Explain the various contributions they make to the formation of some very important structures in the head and neck region. Explain their consequent anomalies in case they fail to migrate properly.

Topic 3: Embryology of the Head, Face & Oral Cavity

Contents/ Topics	**Outcomes/ Knowledge**
1. Neural Crest Cells and Head Formation	Discuss the role of neural crest cells in formation of face and other related structures.

2. Branchial (Pharyngeal) Archesand the Primitive Mouth	Explain in detail the branchial system, formation of its various components i.e. arches, pouches and grooves. Discuss in detail the various structures which are formed by the branchial system in the human body. Discuss the formation of stomodeum.
3. Formation of the Face	Define the various facial prominences. Discuss their contribution to the formation of different parts of the human face.
4. Formation of the Secondary Palate	Illustrate the formation of primary palate and then the secondary palate and various changes that take place during the process.
5. Formation of the Tongue	Identify the lingual prominences responsible for the formation of various parts of the human tongue. Describe the developmental timing and anatomical division of the tongue in regards to its formation.
6. Development of the Skull	Explain the growth of various bones responsible for the formation of an intact human skull.
7. Development of the Mandible and Maxilla	Describe in detail the processes responsible for initiation of the development of mandible and maxilla. Explain the bony growth pattern and the simultaneous ossification schemes observed during the development of maxilla and mandible.
8. Development of theTemporomandibular Joint	Identify the sites from where the growth of TMJ initiates. Explain the key processes involved in the development of soft and the hard tissues present within TMJ.
9. Congenital Defects	Define the congenital defects. Explain its types and reasons of occurrence.

	Discuss the various clinical features observed in these patients.

Topic 4: Cytoskeleton, Cell Junctions, Fibroblasts, and Extracellular Matrix

Contents/ Topics	Outcomes/ Knowledge
1. Cytoskeleton	Describe the structure of cytoskeleton with its classification and individual subtype traits.
2. Intercellular Junctions	Explain the types of various cell junctions. Relate the structure of each type of cellular junction with clinical anomaly that might occur in case of its disruption.
3. Epithelium–Connective TissueInterface	Discuss the structure of epithelium. Describe the structure of basal lamina and its various constituents. Explain the components of connective tissue in detail.
4. Fibroblasts	Discuss the morphological features of a fibroblastic cell in detail. Describe the various functions it performs along with its mode of mobility. Discuss the heterogeneity of fibroblasts along with the junctions it makes. Explain that how a fibroblast ages.
5. Secretory Products of Fibroblasts	Discuss in detail the formation of collagen, its various types and clinical anomalies in case of its mutation. Describe the architecture and functional significance of Elastins, Proteoglycans & Glycoproteins. Discuss the different growth factors and cytokines produced by these cells. Explain the process of extracellular matrix degradation highlighting the role of MMPs in particular.

Topic 5: Development of Tooth & its Supporting Structures

Contents/ Topics	Outcomes/ Knowledge
1. Primary Epithelial Band	Define the PEB. Discuss its types, their location and the structures to which they contribute. Identify the anomalies in case normal apoptotic pattern is not followed.
2. Initiation of the Tooth	Explain in detail the genes involved in the initiation of tooth formation.
3. Tooth Type Determination	Define tooth patterning. Explain the 2 individual models illustrating the patterning of dentition in human oral cavity.
4. Instructive Signals forPatterning	Discuss the role of genetics in regards to morphological differences among various tooth families.
5. Regionalization of Oral andDental Ectoderm	Specify the localization of tooth bearing versus non tooth bearing areas of the oral cavity.
6. Bud Stage	Discuss the morphological as well as the histological changes observed during this stage of tooth development.
7. Bud-to-Cap Transition	Discuss the morphological as well as the histological changes observed during this transition stage of tooth development.
8. Cap Stage	Discuss the morphological as well as the histological changes observed during this stage of tooth development.
9. Enamel Knot	Describe the emergence of various transient structures in the cap stage of tooth development. Discuss their functional significance as well.

10. Bell Stage	Discuss the morphological as well as the histological changes observed during this stage of tooth development.
11. Nerve and Vascular Supply During Early Development	Describe that how the vascular and neural components introduce themselves in various stages of tooth development augmenting tooth formation.
12. Formation of the PermanentDentition	Explain the formation of successive dentition once the primary dentition is formed.
13. Hard Tissue Formation	Describe the role of reciprocal induction leading to the formation of dentin and enamel.
14. Root Formation	Discuss the role of HERs in formation of root component of tooth. Identify the various clinical anomalies that might occur in case of any abnormal consequences.
15. Tooth Eruption	Define tooth eruption. Describe briefly that how a tooth erupts in the oral cavity once it is formed.
16. Formation of Supporting Tissues	Explain the processes and cells involved in the formation of supporting structures of the tooth.

Topic 6: Bone

Contents/ Topics	**Outcomes/ Knowledge**
1. Gross Bone Histology	Explain the basic structure of bone. Describe its composition by weight & volume. Understand the various bone terminologies.

2. Bone Cells	Explain the morphological and histological architecture of various bone cells. Discuss the various mechanisms of regulation of bone cell formation.
3. Bone Development	Discuss the various types of bone development mechanisms along with its types and areas of distribution. Illustrate the methodology of burn turnover or bone remodeling in detail highlighting all its individual steps.

Topic 7: Enamel: Composition, Formation & Structure

Contents/ Topics	**Outcomes/ Knowledge**
1. Physical Characteristics of Enamel	Describe the various physical aspects of the enamel as a hard dental tissue.
2. Structure of Enamel	Explain the crystalline structure of enamel. Describe the components which make up this tissue along with their percentages and structural orientation. Discuss the rod and inter rod relationship observed in the structure of enamel.
3. Amelogenesis	Define the process of amelogenesis. Review the reciprocal induction and the cellular physiological aspects.
4. Light Microscopy ofAmelogenesis	Discuss the morphological and histological changes observed in ameloblasts via light microscopy.
5. Electron Microscopy of Amelogenesis	Discuss the morphological and histological changes observed in ameloblasts via electron microscopy. Describe in detail the life cycle of an ameloblast.

6. Ameloblast Secretory Products	Discuss the secretional significance of the products released by the ameloblasts and their contribution to the bulk of the structure.
7. Mineral Pathway andMineralization	Describe the type of mineralization observed within the dental enamel. Discuss its various phases and types.
8. Regulation of pH During EnamelFormation	Identify the role of pH change during the process of formation of dental enamel.
9. Structural and OrganizationalFeatures of Enamel	Describe in detail the various light microscopic features observed within dental enamel highlighting the incremental formation of the tissue, optical demonstration, regional changes in structure, organic defects, junctions with other dental tissues and surface properties.
10. Age Changes	Identify the various physical and chemical changes observed within aged dental enamel.
11. Defects of Amelogenesis	Explain the clinical aspects of disruption in the structure of dental enamel during the time of its development and the conditions which lead to these anomalies.
12. Clinical Implications	Describe the role of Acid Etching and its rationale. Discuss the role of fluoride in affecting the function and structure of dental enamel.

TOPIC 8: <u>Dentin Pulp Complex:</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
1. Basic structure of dentin	Explain the structure of dentin. Describe the formation of dentin Discuss the structure of dentin
2. Types of Dentin	Classify the dentin. Define types of dentin. Sketch types of dentin.
3. Pattern of Dentin formation	Discuss the pattern of dentinogenesis
4. Dentinogenesis	Describe the odontoblast differentiation. Sketch the odontoblast differentitiaion. Outline the fornation of mantle dentin. Discuss the vascular supply. Discuss the control of mineralization. Define & classify the patterns of mineralization. Outline the formation of root dentin. Describe secondary and tertiary dentinogenesis
5. Histology of dentin	Classify histological types of dentin. Describe the histology of dentinal tubules, pertitubulae, sclerotic, intertubular, interglobular dentin. Sketch the histological types of dentin. Define, describe and classify the incremental lines of Dentin. Define the granular layer of tomes.

	Sketch the granular layer of tomes
6. Pulp	Describe the odontoblasts, fibroblasts, undifferentiated ectomesenchymal cells, macrophages, lymohocytes,dendritic cells, matrix and ground substance of pulp.
7. Vasculature and Lymphatic supply	Describe the vascular and lymphatic supply of pulp.
1. Innervation of the denin-pulp complex	Describe the nerve supply of dentin pulp complex
2. Dentin sensitivity	Define dentin sensitivity. Discuss the various mechanisms of dentin sensitivity.
3. Pulp stones	Define pulp stones. Classify pulp stones.
4. Age changes	Outline the ages changes of dentin. Outline the age changes of pulp.
5. Response to environmental stimuli	Outline the responses of the dentin pulp complex to various external stimuli

Topic 9: <u>Periodontium.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
1. Cementum	Describe the biochemical composition of cementum. Explain the initiation of cementum formation. Outline the origin of periodontal cells and differentiation of cementoblasts.

	Outline the molecular factors regulating cementogenesis.
2. Cementum varieties	Classify cementum varieties. Identify and describe the cementum varieties. Outline the distribution of cementum varieties along the root.
3. Cementoenamel Junction.	Define and identify the cementoenamel junction. Identify the attachment of cementum onto dentin.
4. Alveolar Process	Define the alveolar process. Describe the histological process of alveolar bone. Identify and sketch the alveolar process.
5. Periodontal Ligament	Define periodontal ligament. Describe the composition of PDL. Sketch the principal and gingival ligament fibers of PDL. Recognize the nerve and blood supply of PDL. Interpret the adaptation of PDL to functional demand.

Topic 10: <u>Physiological Tooth Movement: Eruption and shedding.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
1. Preeruptive tooth movement	Define the preeruptive tooth movements. Classify the preeruptive tooth movements.
2. Eruptive tooth movement	Recognize the histological features of eruptive tooth movement. Describe the mechanisms of eruptive tooth movement.

3. Post eruptive tooth movement.	Define the post eruptive tooth movements. Outline the three categories of post eruptive tooth movements.
4. Shedding of teeth.	Describe the mechanisms of shedding. State the pattern of teeth shedding.
5. Abnormal Tooth Movement	Define the abnormal tooth movement. Describe, classify and categorize the abnormal tooth movements.
6 Orthodontic tooth movement	Define the orthodontic tooth movement. Describe the mechanism of orthodontic tooth movement.

Topic 11: <u>Salivary Glands.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
1. Functions of saliva.	Define saliva. Identify the composition of saliva. Classify salivary functions. Describe the functions of saliva with respect to its composition.
2. Anatomy	Identify the major & minor salivary glands. Classify the salivary glands. Describe the anatomy of salivary glands.
3. Development	Describe the embryological development of salivary glands.

4. Structure.	Describe the structure & histology of secretory cells, myoepithelial and ductal cells. Sketch the secretory and ductal cells of salivary gland. Describe the mechanism of formation of saliva. Describe the mechanism of secretion of saliva. Recognize the blood and nerve supply of salivary glands. Summarize the salivary gland structure.
5. Histology of major Salivary glands.	Identify the histological sections of major salivary glands. Sketch and describe the major salivary glands.
6 Histology of minor Salivary glands	Identify the minor salivary glands. Sketch and describe the minor salivary glands.
7 Clinical considerations	Recognize the age changes in salivary tissue. Recognize the pathological changes in the salivary glandular tissue. Interpret the pathological changes of the salivary glands.

Topic 12: <u>Oral Mucosa.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
1. Definition of oral mucosa.	Define oral mucosa. Classify & discuss the functions of oral mucosa.
2. Boundaries of the Oral Mucosa	Discuss the organization of the oral mucosa. Interpret the clinical features and anatomic locations of the main types of mucosa.
3. Component Tissues and Glands	Describe the component tissues of the epithelium.

Oral Epithelium	Describe the epithelial proliferation and maturation. Describe the ultrastructure of the epithelial cell. Describe the cellular events in the maturation. Sketch the principal structural features od epithelial cells in successive layers of keratinized and non-keratinized epitheium.
4. Junction of the Epithelium and Lamina Propria.	Recognize the junction of oral epithelium & lamina propria. Define and describe lamina propria. Recognize and describe the cellular and intercellular matrix composition of lamina propria.
5. Blood Supply Nerve Supply	Identify and discuss the blood supply of oral mucosa. Identify and describe the nerve supply of oral mucosa.
6 Structural Variations	Identify and describe the structural variations between the masticatory, lining and specialized mucosa.
7 Junctions in the Oral Mucosa	Define the various junctions within the oral mucosa. Describe and sketch these junctions. Interpret the clinical significance of the junctions of oral mucosa.
8 Development of the Oral Mucosa	Describe the development of oral mucosa.
9 Age Changes	Identify the age changes within oral mucosa. Interpret &correlate the changes in the oral mucosa.

Topic 13: <u>Temporomandibular Joint.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**

1. Classification of Joints	Define joint. Classify joints. Describe the fibrous, cartilaginous and synovial type of joints
2. Type of Joints.	Describe & sketch the structure of TMJ.
3. Development of Joint	Describe the development of temporomandibular joint
4. Bones, cartilage, capsule, ligaments and disk of the joint	Identification of the bones making up the temporomandibular joint. Describe and sketch the cartilage associated with the TMJ. Describe the capsule of the joint. Describe the ligaments associated with the TMJ. Describe disk of the joint. Describe the synovial membrane.
5. Muscles that cause movement.	Describe the muscles associated with the joint movement, muscle contraction & motor unit. Explain the origin, insertion and action of the muscles of mastication.
6. Biomechanics of the joint.	Discuss the biomechanics of the joint.
7.Innervaton and blood supply of the Joint.	Identify and describe the blood supply of the joint. Identify and describe the nerve supply of the joint.

Topic 14: <u>Repair and Regeneration of Oral Tissues.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**

1. Wound Healing in Oral Mucosa	Define repair and regeneration. Describe the mechanism of wound healing. Illustrate the stages of wound healing. Summarize tissue repair.
2. Wound Healing at the Dentogingival Junction	Discuss the wound healing at the dentinogingival junction.
3. Repair of Enamel, dentin-pulp complex, dental caries, tooth extraction and periodontium.	Describe the repair of enamel. Describe the repair of dentin pulp complex Define dental caries. Classify dental caries. Describe and illustrate the repair following tooth extraction. Describe the repair of periodontium. Compare the repair response in skin and teeth.
4. Repair potential of periodontium.	Describe the repair potential of periodontal tissues. Describe the mechanisms of repair and regeneration of the periodontal connective tissues.

Topic 15: <u>Facial growth and Development.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
1. Facial Types and profiles	Define and classify facial types. Define and classify facial profiles. Compare the male and female faces. Describe the facial age changes.

2. Basic concepts of facial growth.	Describe the processes of remodeling and displacement in facial growth. Describe the curve of occlusion. Describe and summarize the mandibular condyle and growth

B. ORAL PHYSIOLOGY

Contents/ Topics	**Outcomes/ Knowledge**
1. Pain	Describe the mechanism, receptors and pathway of pain in general. Define and discuss the orofacial pain in particular. Discuss the clinical aspects of pain.
2. Taste.	Discuss the taste receptors. Describe the structure of a taste bud. Explain the mechanism of taste sensation. Identify the taste pathway. Overview the applied clinical terminologies used in regards to abnormal taste sensations.
3. Smell.	Explain the structure of the olfactory mucosa highlighting the olfactory receptors. Discuss the receptor mechanisms and olfactory pathway. Classify odours. Overview the applied clinical terminologies used in regards to abnormal smell sensations.
4. Mastication.	Identify the structures involved in mastication. Explain the jaw movements, muscles involved & control mechanisms of mastication. Describe various jaw reflexes.

	Integrate the knowledge of normal masticatory action with the abnormalities observed if any related to this process.
5. Deglutition.	Define deglutition. Explain in detail the phases of swallowing. Explain the mechanism of drinking. Identify the role of muscles in swallowing. Discuss the neural control of swallowing. Classify other mechanisms related to swallowing i.e. suckling and retching. Overview the applied clinical terminologies used in regards to abnormal swallowing.
6. Speech.	Describe speech as a normal physiological mechanism. Explain the components of speech. Describe speech articulators along with classification of speech sounds according to various criteria. Discuss development of articulation. Overview the anomalies in which normal speech are affected.
7. Mineralization.	Define mineralization. Explain the various theories of mineralization and the processes involved.

C. TOOTH MORPHOLOGY.

Topic 1: <u>Introduction and Nomenclature.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Classification of Dentition & teeth.	Identify either deciduous or permanent teeth by their proper name, figure, arch position, or alternative name. Identify the type and number of deciduous or permanent teeth per quadrant, arch and in total. Identify the type and number of teeth which are anterior or posterior.
General anatomy and dental anatomy	Define or select correct definition for any structure presented n the sections covering general anatomy and anatomical structures. Application of anatomical terms to diagrams or situations.
Dental Formulae, Eruption patterns and sequence.	Demonstrate knowledge of dental formulae by supplying, or selecting from **a** list. Indicate the normal eruption sequence, or order, for deciduous and permanent teeth, by listing, or selecting from a list, the proper sequences.
Dentition periods, Succedaneous teeth.	Define, or correctly identify from a list, the three periods of man's dentition, as well as identify the approximate time intervals of their existence, and normal initiation and termination events. Define the term "succedaneous", and be able to select from a list the tooth or teeth which are succedaneous.
Dental nomenclature.	Identify, or select from a list, the proper name for tooth surfaces, or thirds of tooth surfaces, when given a diagram or description. Select the correct answer from a list, or supply the correct name, for line or point angles, when given a diagram or description.
Tooth numbering systems.	Demonstrate knowledge of the various dental numbering systems presented, by selecting from a list, the correct name

	or description for a given symbol, or the correct symbol for a given name or description. Provide, or select from a list, the correct definition, or application thereof, for any of the dentition classifications studied. Provide, or select from a list, the correct definition of any underlined term not included in any previous objective. Applications of these terms to descriptions. diagrams, or situations

Topic 2: ANATOMIC AND PHYSIOLOGIC CONSIDERATIONS OF FORM AND FUNCTION.

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Comparative dental anatomy.	Differentiate between the dental terms by correctly defining them and selecting the proper response from a series of definitions or their applications. Name the major functions of the human dentition, or select the correct response from a series of choices which relate to these functions or their applications.
Curves of occlusion	Select the correct response from a series of choices which describe the steps involved in the evolution of the human dental mechanism, or how these steps relate to form and function. Provide an understanding of lobes by correctly selecting from a series of choices, or identifying from a two-dimensional diagram, the number and names of the lobes

	of the anterior and posterior teeth, the major portions of each tooth which compose lobes, and the major structures separating lobes. Differentiate between the general axial positions of any of the various permanent teeth, by selecting the correct response from a series of descriptions or diagrams.
Crown Surface Form, Contact areas, interproximal spaces, embrasures, line angles.	Differentiate between the crown surfaces of teeth by matching them with their correct general shape or by relating the shape to the specific function of the tooth. Describe, or differentiate between contact areas by providing, or selecting from a series of choices the correct information Describe, or correctly select from a series of choices, the components, **bound**aries, or functions of the interproximal space. Describe, or differentiate between embrasures by providing, or selecting from a series of choices, the correct information regarding purpose, name and general rules of embrasures.
Heights of contours, Cervical line curvatures	Describe, or select from a list of choices the correct information regarding the proper location of the height of contour on the facial and lingual surfaces of the teeth, and its major contribution to gingival health. Differentiate between the levels, depths, and directions of curvature of the cervical lines on all surfaces of both anterior and posterior teeth, by describing them, or by choosing the correct response from a series of choices.
Marginal ridges, continuity of central grooves & root structure.	Describe the proper location and form of marginal ridges and facial line angles, and their relationship to embrasure form, by selecting the correct response from a Series of choices. Identify the normal location of central grooves and occlusal anatomy of posterior teeth in the same manner. Identify, or make applications to the type of root structure necessary for proper function of the different teeth, and the general rules regarding tooth roots and normal number of branches, by selecting the correct response from a series of choices.

	Demonstrate a knowledge of the protective functional form of the teeth, by correctly labeling, or choosing between diagrams which illustrate proper and improper form, or by matching specific tooth form with its complementary physiologic activity.

Topic 3: <u>The Permanent Incisors.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	List the appropriate age(s) concerning developmental chronology of the permanent incisors found in the development tables, or select the appropriate age(s) from a list, when given a certain developmental feature. Compare these ages among the permanent incisors.
Maxillary and Mandibular Incisors.	Demonstrate a knowledge of the morphology of each surface of the crown, as well as the root, of each permanent incisor by: 1. describing, 2. selecting the correct information from a list, **3.** or interpreting a diagram to identify or name any of the following features: a. Contours of any surface or margin of any surface. b. Structural entities such as mamelons, grooves, pits, ridges, fossae, lobes, cingula, etc. c. Height of contour and contact areas. d. Relative dimensions and shapes. e. Any other surface feature. Make comparisons among the general characteristics of the permanent incisors, including function, arch position, distinguishing features, etc., by describing them or selecting the correct response from a list,

	when given the tooth (teeth), or a description of the general characteristics. Determine from a diagram or description whether a given permanent incisor is maxillary or mandibular, right or left, or central or lateral. Determine the correct universal number or Palmer notation for a given diagram or description of any permanent incisor. Demonstrate a knowledge of any of the new terms by defining them, or selecting the correct definition, or application thereof, from a list, when given the term or any of its applications. Demonstrate knowledge of any of the variations or anomalies of maxillary & mandibular incisors by describing them, or selecting the correct response from a list, when given the particular tooth (teeth). the anomaly, or any of its features or applications

Topic 4: <u>The Permanent Canines.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	List the appropriate age(s) concerning developmental chronology of the permanent canines found in the development tables, or select the appropriate age(s) from a list, when given a certain developmental feature. Compare these ages between the canines.
Maxillary and Mandibular canine.	Demonstrate a knowledge of the morphology of each surface of the crown, as well as the root, of each permanent canine by: 1. describing, 2. selecting the correct information from a list, **3.** or interpreting a diagram to identify or name any of the following features: a. Contours of any surface or margin of any surface. b. Structural entities such as grooves, pits, ridges, fossae, lobes, cingula, etc.

	c. Height of contour and contact areas. d. Relative dimensions and shape. e. Any other surface feature. Compare any of these features between the canines. Make comparisons between permanent incisors and canines, where appropriate, by selecting the correct response from a list.
	Make comparisons between the general characteristics of the permanent canines, including function, arch position, distinguishing features, etc., by describing them, or selecting the correct response from a list, when given the tooth (teeth), or a description of the general characteristic(s). Determine from a diagram or description whether a given permanent canine is maxillary or mandibular, or right or left. Determine the correct universal number or Palmer notation for a given diagram or description of any permanent canine. Demonstrate a knowledge of any of the variations or anomalies of maxillary and mandibular canines by describing them, or selecting the correct response from a list, when given the particular tooth (teeth), the anomaly, or any of its features or applications.

Topic 5: <u>The Permanent Maxillary Premolars.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	List the appropriate age(s) concerning the developmental chronology of the maxillary premolars found in the development tables, or select the appropriate age(s) from a list, when given a certain developmental feature.

	Compare the facts between the maxillary premolars.
Maxillary 1st and 2nd premolars.	Demonstrate a knowledge of the morphology of each surface of the crown, as well as the root, of each permanent maxillary premolar by: 1. describing, 2. selecting the correct information from a list, **3.** or interpreting a diagram to identify or name any of the following features: a. Contours of any surface, or margin of any surface. b. Structural entities such as grooves, pits, ridges, inclined planes, cusps, fossae, lobes, etc. c. Height of contour and contact areas. d. Relative dimensions and shape. e. Any other surface feature. Comparison of any of the features between the maxillary premolars.
Differences and anomalies	Make comparisons between the general characteristics of the maxillary premolars, including function, arch position, distinguishing features, etc., by describing them, or selecting the correct response from a list, when given the tooth (teeth), or a description of the general characteristic(s). Determine from a diagram or description whether a given maxillary premolar is first or second, or right or left. Determine the correct universal number or Palmer notation for a given diagram or description of any maxillary premolar. Demonstrate a knowledge of any of the new terms by defining them, or selecting the correct definition, or application thereof, from a list, when given the term, or any of its applications. Demonstrate a knowledge of any of the variations or anomalies of maxillary premolars by describing them, or selecting the correct response from a list, when given the particular tooth (teeth), the anomaly, or any of its features or applications

Topic 6: <u>The Permanent Mandibular Premolars.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	List the appropriate age(s) concerning the developmental chronology of the maxillary premolars found in the development tables, or select the appropriate age(s) from a list, when given a certain developmental feature. Compare the facts between the mandibular premolars.
Mandibular 1st and 2nd premolar.	Demonstrate a knowledge of the morphology of each surface of the crown, as well as the root, of each permanent maxillary premolar by: 1. describing, 2. selecting the correct information from a list, **3.** or interpreting a diagram to identify or name any of the following features: a. Contours of any surface, or margin of any surface. b. Structural entities such as grooves, pits, ridges, inclined planes, cusps, fossae, lobes, etc. c. Height of contour and contact areas. d. Relative dimensions and shape. e. Any other surface feature. Comparison of any of the features between the mandibular premolars.
Differences and anomalies	Make comparisons between the general characteristics of the mandibular premolars, including function, arch position, distinguishing features, etc., by describing them, or selecting the correct response from a list, when given the tooth (teeth), or a description of the general characteristic(s). Determine from a diagram or description whether a given mandibular premolar is first or second, or right or left. Determine the correct universal number or Palmer notation for a given diagram or description of any mandibular premolar.

	Demonstrate a knowledge of any of the new terms by defining them, or selecting the correct definition, or application thereof, from a list, when given the term, or any of its applications. Demonstrate a knowledge of any of the variations or anomalies of mandibular premolars by describing them, or selecting the correct response from a list, when given the particular tooth (teeth), the anomaly, or any of its features or applications

Topic 7: <u>The Permanent Maxillary Molars.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	List the appropriate age(s) concerning the developmental chronology of the maxillary molars found in the development tables, or select the appropriate age(s) from a list, when given a certain developmental feature. Compare any of the above features among maxillary molars.
Maxillary 1st , 2nd& 3rd molar.	Demonstrate a knowledge of the morphology of each surface of the crown, as well as the root, of each permanent maxillary molar by: 1. describing, 2. selecting the correct information from a list, **3.** or interpreting a diagram to identify or name any of the following features: a. Contours of any surface, or margin of any surface. b. Structural entities such as grooves, pits, ridges, inclined planes, cusps, fossae, lobes, etc. c. Height of contour and contact areas. d. Relative dimensions and shape. e. Any other surface feature. Comparison of any of the features between the maxillary molars.

Differences and anomalies	Make comparisons between the general characteristics of the maxillary molars, including function, arch position, distinguishing features, etc., by describing them, or selecting the correct response from a list, when given the tooth (teeth), or a description of the general characteristic(s). Determine from a diagram or description whether a given maxillary molar is first or second, or right or left. Determine the correct universal number or Palmer notation for a given diagram or description of any maxillary molar. Demonstrate knowledge of any of the new terms by defining them, or selecting the correct definition, or application thereof, from a list, when given the term, or any of its applications. Demonstrate knowledge of any of the variations or anomalies of maxillary molars by describing them, or selecting the correct response from a list, when given the particular tooth (teeth), the anomaly, or any of its features or applications

Topic 8: <u>The Permanent Mandibular Molars.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	List the appropriate age(s) concerning the developmental chronology of the mandibular molars found in the development tables, or select the appropriate age(s) from a list, when given a certain developmental feature. Compare any of the above features among mandibular molars.
Mandibular 1st and 2nd& 3rd molar.	Demonstrate a knowledge of the morphology of each surface of the crown, as well as the root, of each permanent mandibular molar by: 1. describing, 2. selecting the correct information from a list, **3.** or interpreting a diagram to identify or name any of the following features:

	a. Contours of any surface, or margin of any surface. b. Structural entities such as grooves, pits, ridges, inclined planes, cusps, fossae, lobes, etc. c. Height of contour and contact areas. d. Relative dimensions and shape. e. Any other surface feature. Comparison of any of the features between the mandibular molars.
Differences and anomalies	Make comparisons between the general characteristics of the mandibular molars, including function, arch position, distinguishing features, etc., by describing them, or selecting the correct response from a list, when given the tooth (teeth), or a description of the general characteristic(s). Determine from a diagram or description whether a given mandibular molar is first or second, or right or left. Determine the correct universal number or Palmer notation for a given diagram or description of any mandibular molar. Demonstrate knowledge of any of the new terms by defining them, or selecting the correct definition, or application thereof, from a list, when given the term, or any of its applications. Demonstrate knowledge of any of the variations or anomalies of mandibular molars by describing them, or selecting the correct response from a list, when given the particular tooth (teeth), the anomaly, or any of its features or applications

Topic 9: <u>PULP CAVITIES.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	Define any of the anatomical terms relating to the pulp, or select the correct definition, or application thereof, from a list, when given the term or a description or application of a term.

	List the main functions of the pulp, or differentiate between them by selecting the correct response from a list, when given the function or any of its applications.
Pulp tissue and pulp cavities	Describe, or choose the correct response from a list concerning the changes which occur in the pulp and pulp cavity due to development, aging, or pathology. Differentiate between the various pulp sections by describing or selecting the correct response from a list regarding their feasibility by x-ray, or any of their advantages or disadvantages.
Sectioning of the pulp cavity	Identify from a diagram or written description of any of the common sections of the pulp cavity, which permanent tooth is being described or diagrammed.
Pulp cavities of the individual permanent teeth	Demonstrate knowledge of the normal pulpal anatomy and morphology for all the individual permanent teeth by describing it. Comparison among the permanent teeth, when given a description of the anatomical feature. Anatomy and morphology include numbers, locations, shapes, outlines, relative thickness and lengths of pulp cavities, pulp horns, pulp chambers, chamber floors, orifices, pulp canals, and apical foramina, in any of the common sections or views. Demonstrate a knowledge of the commonly observed differences from normal pulpal morphology for any of the individual permanent teeth by describing them for any tooth or group of teeth, or by selecting the correct response from a list, when given the normal anatomy or the deviations from normal. Demonstrate knowledge of the anatomy and components of a normal maxillary molar triangle by identifying them from a diagram or description.

Topic 10: <u>THE DECIDUOUS DENTITION.</u>

Contents/ topics	**Outcomes/ knowledge** **(the students should be able to know the**
Introduction	Demonstrate a knowledge of the general differences between the permanent and deciduous teeth, by describing them, or selecting the correct response from a list, when given one or more differences, or any appropriate implications of these differences.
Comparisons between permanent and deciduous dentition	Make comparisons between specific deciduous teeth and their permanent counterparts, where appropriate, by describing the differences, or selecting the correct information from a list. Determine from a diagram or description which deciduous tooth is being described, or illustrated. Provide the correct universal number or Palmer notation for a given diagram or description of any deciduous tooth.
Description of individual deciduous teeth.	Demonstrate a knowledge of the morphology of each surface of the crown and root of all deciduous teeth by: 1. describing, **2.** selecting the correct information from a list, **3.** or interpreting a diagram to identify or name any of the following features: a. Contours of any surface, or margin of any surface. b. Structural entities such as grooves, pits, ridges, cusps, fossae, etc. c. Relative dimensions and shape. d. Root numbers, location, and contours. e. Any other surface feature. Comparisons of any of the features between any of the deciduous teeth.

Topic 11: <u>DEVELOPMENT OF THE TEETH & ANOMALIES.</u>

Contents/ topics	**Outcomes/knowledge** **(the students should be able to know the**
Tooth Development	Describe the stages of tooth development prior to eruption, as well as the processes which occur during each stage, the normal chronology of each stage, or select from a series of choices the correct information about the stages, when given a description or application. Describe the processes of eruption, resorption, exfoliation, and root completion, or select the correct response from a list regarding these processes or their normal chronology. Indicate a knowledge of the correct relationships of the permanent tooth buds to the roots of their deciduous predecessors by describing them, or choosing the correct information about them from a series of choices. Describe, or select from a list, the correct interpretation of the role played by the permanent first molars in the development of occlusion.
Definition of terms	Indicate the normal eruption sequence, or order, for deciduous and permanent teeth, by listing, or selecting from a list, the proper sequences. Define any of the new terms, for example: enamel cuticle, Hertwig's sheath, ankylosis, active and passive eruption, etc., or select the proper definition, or application thereof, from a list, when given the term or a description or application.
Anomalies	Indicate a knowledge of any of the dental anomalies, by defining or describing them, or by selecting the correct information about the anomaly or its features from a list, when given all, or significant portions of the etiology, clinical or x-ray manifestations, implications, or alternative names. Compare between the various anomalies studied.

ii. Source of Knowledge:

1) Recommended Books:

- Oral Histology Development, Structure & Function by Richard Ten Cate.
- Orban's Oral Histology & Embryology.
- Essentials of Oral Histology & Embryology by Avery.
- Orofacial Embryology by Kamran Ali.
- An Atlas of Oral Anatomy by Berkovitz.
- Tooth Morphology by Fullers.
- Wheeler's Atlas of Tooth Form.
- Essentials of Oral Physiology by Robert M Bradley.
- Oral Physiology by Levalle.

Innovative Teaching Methodologies:

1) Online Sources:

- Wats-app group

2) Flash Cards.

3) Summer Vacation Task.

4) Videos.

5) CDs.

6) Presentations.

iii. UHS Curriculum:

ORAL BIOLOGY

Oral Anatomy
The actions, attachments of the muscles of the mouth and related regions
Facial & jaw bones
Salivary glands
Temporomandibular joint
The nerve supply, blood supply and lymphatic drainage of the orofacial region
Eruption and resorption of teeth
Articulation of teeth and movement during mastication.
Age changes of the teeth and jaws, and their integument

Oral Embryology
Development of human embryo with special emphasis on the pharyngeal apparatus, & role neural crest cells
Development of skull, jaws, face, tongue, palate, & teeth. amelogenesis, dentinogenesis, etc.
Development of deciduous and permanent dentition
Development of occlusion
Common anomalies associated with development of the afore-mentioned

Oral Histology
The microscope and its accessories
Principles governing their use and methods of working with them
Histology, composition and functions of various dental tissues including;
- Enamel
- Dentin-pulp complex
- Cementum
- Periodontal ligament
- Alveolar process

Histology, and functions of oral mucosae, gingivae and the dento-gingival junction,
Microscopic structure of salivary glands
Microscopic structure of temporomandibular joint

Oral Physiology
Composition, functions, control and clinical relevance of saliva.
The phenomenon of taste, smell, mastication, swallowing, pain, proprioception & speech.
Physiology of bone growth & metabolism with special reference to jaw bones. Effects of hormones, diet etc & various disease processes of jaw bones

Tooth Morphology
Study of naked eye anatomy of the primary and permanent teeth
Timings and sequence of eruption & shedding of teeth
Study of the forms and dimensions of the teeth, their drawings and modeling.

Laboratory Assignment

Histological methods: The preparation of (i) hard tissues (ii) soft tissues (iii) combined hard and soft tissues. Decalcification, fixing and hardening, microtomes and methods of cutting sections; staining elective, general and special. Clearing and mounting sections, preserving, Microscopic examination of (i) normal human oral and dental tissues (ii) pathological human oral & dental tissues.

Recommended Books

Oral Histology Development, Structure & Function	Richard Ten Cate
Orban's Oral Histology & Embryology	
Essentials of Oral Histology And Embryology	Avery
Orofacial Embryology	Kamran Ali
An Atlas of Oral Anatomy	Berkovitz
Tooth Morphology	Fuller
Wheeler's Atlas of Tooth Form	
Essentials of Oral Physiology	Robert M Bradley
Oral Physiology	Levalle

iv. UHS Table of Specifications (TOS);

According to the syllabus& TOS of UHS, LHR, are as follows:

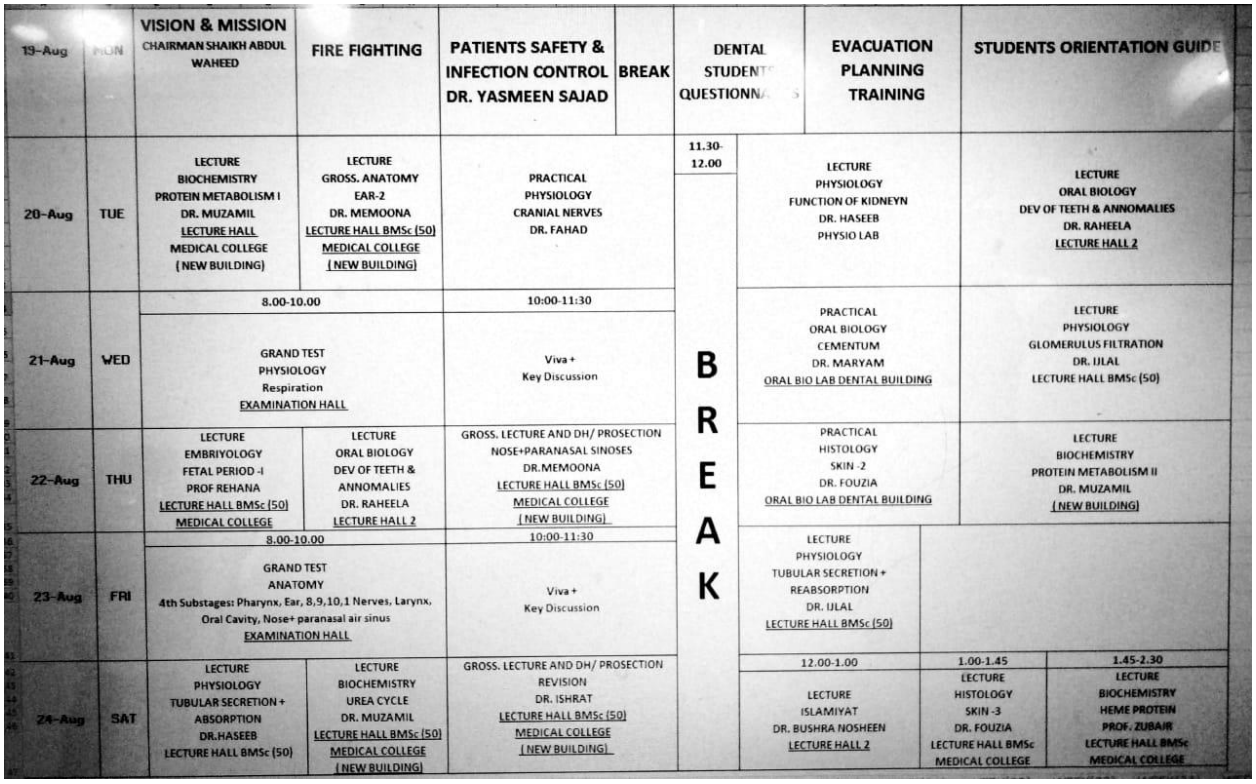
BDS FIRST PROFESSIONAL TABLE OF SPECIFICATIONS (TOS)

ORAL BIOLOGY AND TOOTH MORPHOLOGY

Contents	Topics	MCQs (45)	% MCQs	SEQs (15)	% SEQs	% distribution
I. Oral anatomy	1. Muscles 2. Bones 3. Salivary glands 4. TMJ 5. Nerve and Vascular supply 6. Eruption of teeth 7. Articulation of teeth 8. Age changes	6	13%	2	13%	13%
II. Oral embryology	1. Development of embryo 2. Development of skull, face, tongue, jaws and teeth 3. Development of dentition 4. Development of occlusion 5. Common anomalies	4	9%	1.5	10%	10%
III. Oral Histology	Histology of : 1. Enamel 2. Dentin 3. Cementum 4. Pulp 5. Pdl 6. Alveolar bone 7. Mucosa 8. Salivary glands 9. TMJ	20	45%	7	47%	44%
IV. Oral Physiology	6. Saliva 7. Taste 8. Smell 9. Mastication 10. Swallowing	5	11%	1.5	10%	11%

	11. Pain **12. Speech** **13. Bone growth**					
V. Tooth Morphology	**1. anatomy of primary and permanent dentition** **2. sequence and timing of eruption**	**9**	**20%**	**3**	**20%**	**20%**
VI. Laboratory Assignments	**Histological methods**	**1**	**2%**	**-**	**-**	**2%**
	TOTAL ITEMS	**45 MCQs**		**15 SEQs**		
	TOTAL MARKS	**45*1 = 45**		**15*3 = 45**		

v. Time Table:



19-Aug	MON	VISION & MISSION CHAIRMAN SHAIKH ABDUL WAHEED	FIRE FIGHTING	PATIENTS SAFETY & INFECTION CONTROL DR. YASMEEN SAJAD	BREAK	DENTAL STUDENT QUESTIONN	EVACUATION PLANNING TRAINING	STUDENTS ORIENTATION GUIDE
20-Aug	TUE	LECTURE BIOCHEMISTRY PROTEIN METABOLISM I DR. MUZAMIL LECTURE HALL MEDICAL COLLEGE (NEW BUILDING)	LECTURE GROSS. ANATOMY EAR-2 DR. MEMOONA LECTURE HALL BMSc (50) MEDICAL COLLEGE (NEW BUILDING)	PRACTICAL PHYSIOLOGY CRANIAL NERVES DR. FAHAD		11.30-12.00	LECTURE PHYSIOLOGY FUNCTION OF KIDNEYN DR. HASEEB PHYSIO LAB	LECTURE ORAL BIOLOGY DEV OF TEETH & ANNOMALIES DR. RAHEELA LECTURE HALL 2
21-Aug	WED	8.00-10.00 GRAND TEST PHYSIOLOGY Respiration EXAMINATION HALL		10:00-11:30 Viva + Key Discussion	B R E A K		PRACTICAL ORAL BIOLOGY CEMENTUM DR. MARYAM ORAL BIO LAB DENTAL BUILDING	LECTURE PHYSIOLOGY GLOMERULUS FILTRATION DR. IJLAL LECTURE HALL BMSc (50)
22-Aug	THU	LECTURE EMBRIYOLOGY FETAL PERIOD -I PROF REHANA LECTURE HALL BMSc (50) MEDICAL COLLEGE	LECTURE ORAL BIOLOGY DEV OF TEETH & ANNOMALIES DR. RAHEELA LECTURE HALL 2	GROSS. LECTURE AND DH/ PROSECTION NOSE+PARANASAL SINOSES DR.MEMOONA LECTURE HALL BMSc (50) MEDICAL COLLEGE (NEW BUILDING)			PRACTICAL HISTOLOGY SKIN -2 DR. FOUZIA ORAL BIO LAB DENTAL BUILDING	LECTURE BIOCHEMISTRY PROTEIN METABOLISM II DR. MUZAMIL (NEW BUILDING)
23-Aug	FRI	8.00-10.00 GRAND TEST ANATOMY 4th Substages: Pharynx, Ear, 8,9,10,1 Nerves, Larynx, Oral Cavity, Nose+ paranasal air sinus EXAMINATION HALL		10:00-11:30 Viva + Key Discussion			LECTURE PHYSIOLOGY TUBULAR SECRETION + REABSORPTION DR. IJLAL LECTURE HALL BMSc (50)	
24-Aug	SAT	LECTURE PHYSIOLOGY TUBULAR SECRETION + ABSORPTION DR.HASEEB LECTURE HALL BMSc (50)	LECTURE BIOCHEMISTRY UREA CYCLE DR. MUZAMIL LECTURE HALL BMSc (50) MEDICAL COLLEGE (NEW BUILDING)	GROSS. LECTURE AND DH/ PROSECTION REVISION DR. ISHRAT LECTURE HALL BMSc (50) MEDICAL COLLEGE (NEW BUILDING)			12.00-1.00 LECTURE ISLAMIYAT DR. BUSHRA NOSHEEN LECTURE HALL 2	1.00-1.45 LECTURE HISTOLOGY SKIN -3 DR. FOUZIA LECTURE HALL BMSc MEDICAL COLLEGE / 1.45-2.30 LECTURE BIOCHEMISTRY HEME PROTEIN PROF. ZUBAIR LECTURE HALL BMSc MEDICAL COLLEGE

vi. Internal Assessment Policy:

Oral Biology & Tooth Morphology:

1) Continuous internal assessment consists of appropriate evaluation at the end of each assignment, term, major/monthly test or course of the curriculum. Proper records of internal evaluations should be maintained and the scores obtained in these tests should contribute 10% to the final total score of the candidates, that 10% may include class tests, monthly test, send-up, assignment, reviews which all have specific marks allocation.
2) Final university examination of each subject should contribute 90% to the total score, and the students should secure passing marks on the aggregate of the total marks.
3) 10% marks of internal evaluation will be added in theory of annual exam. Students should know what is expected of them. They should be able to identify the characteristics of a satisfactory answer and understand the relative importance of those characteristics. This can be achieved in many ways; you can provide feedback on assignments, describe your expectations in class, or post model solutions.
4) No grace marks should be allowed in any examination.
5) Written examinations consist of MCQ's, short structured essays (according to curriculum) questions.
6) During the course, students will be assessed to determine achievement of course objectives. The test will be scheduled on completion of each chapter. The method of examination comprises of theory exam which includes SEQS, MCQS, practical (Objective Structured Practical Examination) and viva voce.

Number of Marks Allocated For University Examination and Internal Assessment

SEMESTER/ ANNUAL EXAMINATION MARKS	INTERNAL EVALUATION (Class tests + Journals + Assignments + Modular Exam	TOTAL THEORY & PRACTICAL
THEORY: 90%	THEORY: 10%	THEORY: 100%
PRACTICAL:90%	PRACTICAL:10%	PRACTICAL: 100%

DISTRIBUTION OF MARKS FOR FINAL EXAMS EVALUATION

The method of examination and distribution of the 200 marks shall be as follows:

Written Examination:

One paper of 100 marks comprising of an MCQ Section of 45 marks (45 MCQs of 1 mark each) and SEQ Section of 45 marks (comprising of 15 SEQs of 3 marks each) and 10 marks of internal assessment.

Practical Examination:

Practical examination is of 100 marks.

This shall comprise of an objectively structured practical examination **(OSPE)** carrying 24 marks (12 stations carrying 2 marks each), Divided as: 7 histological slides each carrying 2 marks (1 mark for identification and 0.5 mark each for two specific points of identification), 5 tooth models carrying two marks each (1 mark for identification and 1 mark for morphological point of identification).

Drawing and labeling: 1 view/ aspect of structure of jaw/ tooth carrying 6 marks viva voce examination carrying 60 marks (30 marks for evaluation by external examiner and 30 marks for evaluation by internal examiner) and internal assessment carrying 10 marks.

Course Requirements:

Each student is expected to:

1. Achieve passing marks in the internal evaluation/assessment.
2. Achieve a minimum of 75% attendance.

Maintain practical notebooks, with up to date record of all the practical sessions. This includes drawings and record of the histological slides and tooth morphology

INTERNAL ASSESSMENT OF 1st YEAR BDS

The internal assessment of 1st year consists of the following pattern:

Sr. No	MARKS DISTRIBUTION
CLASS TEST	4.5
OSPE	4
VIVAS	4
ASSIGNMENTS	3.5
TERMS	4 marks each term