

STUDY GUIDE

ORAL BIOLOGY

**CIMS DENTAL COLLEGE
MULTAN**

1st Year

BDS

Session 2025

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INTRODUCTION TO STUDY GUIDE

This study guide has been designed for the subject of Oral Biology which is a basic dental science subject to be taught in the BDS 1st professional year. The components of this study guide have been carefully planned keeping in view the curriculum guidelines given by the PMC and NUMS.

Curriculum is a document which is considered as a living dynamic entity and there is always remains a potential to make necessary changes required from time to time in order to overcome the weaknesses and improve the teaching strategies. CIMS Dental College, Multan aims to improve the health indices of society by improvement of students and doctors in preventive health services and providing dental health education to society through community programs.

This study guide also includes, horizontal and vertical integration of curriculum, assessment methods based on institutional strategy. Comprehensive overview of the course contents, course objectives and outcomes have been given in respective sections. This will surely help and guide that how the whole curriculum is divided into different sections and their further break-up into Blocks and Modules will help the student and teacher to remain task oriented.

INTRODUCTION TO ORAL BIOLOGY AND TOOTH MORPHOLOGY

The subject of Oral Biology & Tooth Morphology deals with the study of structure, development, histology & functions of oral and craniofacial tissues. For the purpose of study this subject has been divided into following components which are being taught with the collaboration of basic medical science departments.

Components:

- Oral Anatomy
- General and Oro-facial Embryology
- Oral Histology
- Oral Physiology
- Tooth Morphology and Occlusion

Resources

- A. Teaching Resources
- B. Supporting Staff
- C. Infrastructure Resources

Teaching Staff Resources

Sr. no	Name Of Faculty	Designation
01.	Dr Abdul Ahad	Senior Lecturer & Head of Department
02.	Dr Mahnoor Ch	Demonstrator
03.	Dr Asfa Bajwa	Demonstrator
04.	Dr Sufian	Demonstrator

Supporting Staff

Computer operator/lecture hall attendant appointed by Medical Education Dept

Infrastructure Resources

Sr. No	Infrastructure Resources	Quantity
1	Lecture hall • Seating Capacity 190 • Multimedia • Microphone • Computer system • White Board	2
2	Oral Biology and Tooth Morphology Laboratory • Study models • Microscopes • Moulds for making plaster models of teeth • Oral histological slides • Wax knives and carvers	1

Teaching And Learning Strategies

Multiple educational methods will be used comprising of interactive lectures, practical, group discussions, assignments, oral presentations and self-study.

Methods for achieving cognitive objectives

- Interactive lectures using audio visual aids on power point presentation
- Group discussions in form of large group and small group
- Collaborative learning
- Self-study and reading from learning resources

Methods for achieving psychomotor objectives

- Focusing the histological slides on microscope
- Identification of normal histological structures on slides under different magnification
- Drawing and labeling the histological slides on practical note books

Methods for achieving affective objectives

- Interaction with peers, group members, teachers, support staff etc.
- Group discussions (small and large)
- Oral presentations by students

Learning Methodologies

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

- Interactive lectures
- Small group discussions
- Practical
- Skill sessions
- Self-directed learning
- Assignments
- Oral presentations by students

Interactive lectures

In large group, the lecturer introduces a topic which explains the underlying phenomena through questions, pictures, exercise, etc. Students are actively involved in the learning process.

Small group discussions

This format helps students to clarify concepts and acquire skills and attitudes. Students exchange opinions and apply knowledge gained from lectures and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

Practical

In practical sessions students observe histological slides under microscope or on multimedia for better understanding of the subject. They are also required to maintain practical manuals in which they draw and label histological diagrams and different aspects/views of teeth for better understanding.

Skill session

Students are taught to accurately carve out tooth models from soap for better understanding of tooth morphology.

Self- directed learning

Students take responsibilities for their own learning through, individual study, sharing and discussing with peers, seeking information from Learning Resource Center, teachers and resource persons within and outside the college. Students can utilize the time within the college hours or afterwards for self-study.

Assignments

Students are given written formative assignments on designated topics according to their syllabus and module. Revision of the topics already covered by Anatomy and Physiology departments are given to students as oral presentations.

Oral presentations by students

Students are assigned topics during revision session to enhance their communication skills and group learning.

Time Frame

1 st Year BDS ORAL Biology Hours Distribution										
Sr. No	Subject	Lecture Hours	Practical Hours	CBL	SGD	PBL	SDL	Total Hours CDC	Hours NUMS	Hours PM&DC
01	Oral Biology	99	66	20 (8+6+6)	10 (4+3+3)	3 (1+1+1)	—	198	170	-

Course duration: 36 weeks (12+12+12)

Lectures: Wednesday & Friday

Practical: Thursday & Friday

CBL/SGD/PBL: Thursday & Friday

Course Outline

Section I **Oral Anatomy:**

This subject deals with the gross anatomy of oro-facial region including, anatomy of maxilla and mandible, temporomandibular joint, muscles of mastication and tongue. It also incorporates study of blood vessels and nerves of oro-facial region. This component is being taught in collaboration with Anatomy department.

Section II **General and Oro-facial Embryology:**

This subject deals with the embryonic development including, development of face, jaws, palate, tongue and TMJ in general. Special emphasis is given to the development of tooth, enamel, dentin-pulp complex, periodontium, oral mucosa and salivary glands. Developmental anomalies of oro-facial structures are also explained side by side normal development. This component is also being taught in collaboration with Anatomy department.

Section III **Oral Histology:**

This subject deals with the study of histological aspect of all soft and hard tissues of oro-facial region including, oral epithelium, enamel, dentin-pulp complex, periodontium, bone, TMJ and salivary glands. Along with the histology, the clinical significance of these tissues is also taught which gives the applied knowledge of these tissues to be used in interpretation of different dental diseases.

Section IV **Oral Physiology:**

This subject deals with the study of functional basis of oro-facial structures so that the importance of each structure is elaborated. In addition to this, some special functions related to oral cavity are also taught like, mastication, deglutition, speech, taste, saliva, pain and proprioception. This component is also being taught in collaboration with Physiology department.

Section V **Tooth Morphology and Occlusion:**

This subject deals with the gross anatomy of individual deciduous and permanent teeth, their chronology, identification, comparison and elaboration of detailed morphological features. This also includes development of occlusion and its significance in clinical dentistry.

CURRICULUM MAP ORAL BIOLOGY

Program name: BDS PLOs (Program Learning Outcomes):					
Year of Study: First Year Module Name: Orofacial Biology					
Task Force members/Disciplines: Oral Biology, General Anatomy Module coordinator: Dr Abdul Ahad					
Prerequisite: Module Rationale: Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK 01					
01-03-24	Introduction to General Embryology		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK 02					
06-03-24	Staining Histo Diagram		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
06-03-24	Simple Epithelium Types		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-03-24	Significance of Dental Formulae		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-03-24	Dental Formula		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-03-24	1-2 week of Development		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-03-24	Introduction to Tooth Morphology		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
08-03-24	2-3 week of Development		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
08-03-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Program name: BDS PLOs (Program Learning Outcomes):					
Year of Study: First Year Module Name: Tooth Form & Function					
Task Force members/Disciplines: Oral Biology, Preclinical Operative Module coordinator: Dr Abdul Ahad					
Prerequisite: Module Rationale: Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK 03					
13-03-24	Terms used in Embryogenesis		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
14-03-24	Trilaminar Germ Disc		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
14-03-24	Significance of Interproximal Space		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
14-03-24	Interproximal Space		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
14-03-24	Week 3 of Development-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
14-03-24	Numbering Systems		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
15-03-24	Pharyngeal Apparatus		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
15-03-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK 04					
20-03-24	Neurulation		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
20-03-24	Derivatives of Germ Layers		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
21-03-24	Crown Elevations & Depressions		C1, C2, C3, P1,	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

			P2, A		
21-03-24	Line & Point Angles		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
21-03-24	Development of Jaws		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
21-03-24	Nomenclature-1		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
22-03-24	Development of Face & Palate		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
22-03-24	Drawings/Models/Carving/ Module Test		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Program name: BDS					
PLOs (Program Learning Outcomes):					
Year of Study: First Year					
Module Name: Growth & Development					
Task Force members/Disciplines: Oral Biology, Oral Pathology, OMFS, Orthodontics, General Anatomy					
Module coordinator: Dr Abdul Ahad					
Prerequisite:					
Module Rationale:					
Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK 05					
27-03-24	Age Estimation		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
27-03-24	Derivatives of Arches & Pouches		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
28-03-24	Crown Preparation		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
28-03-24	Model Demonstration		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
28-03-24	Anomalies of Face & Palate		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
28-03-24	Nomenclature-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
29-03-24	Facial Growth & Development		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
29-03-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK 06					
03-04-24	Feedback Module Test		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
03-04-24	Buccopharyngeal Membrane		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
04-04-24	Dentofacial Deformities		C1, C2, C3, P1,	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

			P2, A		
04-04-24	Model Demonstration		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
04-04-24	Development of Tongue		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
04-04-24	Type Traits of Maxillary Incisors		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
05-04-24	Development of Tooth-1		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
05-04-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK 07					
17-04-24	Cleft Lip & Palate		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
17-04-24	Primary Epithelium Band & Bud Stage		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
18-04-24	Anomalies of Tongue		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
18-04-24	Drawings/Models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
18-04-24	Development of Tooth-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
18-04-24	Arch Traits of Canines		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
19-04-24	Mol Basis of Tooth Development		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
19-04-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Program name: BDS PLOs (Program Learning Outcomes):					
Year of Study: First Year Module Name: Dental Tissues					
Task Force members/Disciplines: Oral Biology, Preclinical Operative, Science of Dental Materials, Operative Dentistry, Oral Pathology Module coordinator: Dr Abdul Ahad					
Prerequisite: Module Rationale: Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK 08					
24-04-24	Odontogenic Genes		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
24-04-24	Cap & Bell Stage		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
25-04-24	Tooth Anomalies		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
25-04-24	Drawings/Models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
25-04-24	Basic Structure of Dentin-1		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
25-04-24	Carving-1		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
26-04-24	Histology of Dentin		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
26-04-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK 09					
02-05-24	Clinical Considerations		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
02-05-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
02-05-24	Basic Structure of Dentin-2		C1, C2,	Lect, SGD,	MCQ, SEQ,

			C3, P1, P2, A	CBL, Pract	OSPE, VIVA
02-05-24	Carving-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
03-05-24	Dentinogenesis		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
03-05-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK 10					
08-05-24	Dentin Sensitivity		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
08-05-24	Types of Dentine		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
09-05-24	Histology of Pulp		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
09-05-24	Drawings/Models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
09-05-24	Basic Structure of Enamel		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
09-05-24	Histology of Enamel		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
10-05-24	Amelogenesis		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
10-05-24	Drawings/Models/Carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Program name: BDS PLOs (Program Learning Outcomes):					
Year of Study: First Year Module Name: Periodontal Tissues					
Task Force members/Disciplines: Oral Biology, Oral Pathology, Orthodontics, Operative Dentistry, Prosthetics, Periodontology. Module coordinator: Dr Abdul Ahad					
Prerequisite: Module Rationale: Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK-1					
22-05-24	Clinical considerations of pulp		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
22-05-24	Zones of pulp		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
23-05-24	Clinical considerations of enamel		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
23-05-24	Organic defects of enamel		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
23-05-24	Integrated learning		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
23-05-24	Integrated learning		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
24-05-24	Tooth carving		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
24-05-24	Secretory, maturative ameloblast		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-2					
29-05-24	Bone		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
29-05-24	Maxillary 1 st premolar		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
30-05-24	Histology of bone		C1, C2,	Lect, SGD,	MCQ, SEQ,

			C3, P1, P2, A	CBL, Pract	OSPE, VIVA
30-05-24	Tooth morphology drawing/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
31-05-24	Dentin-enamel junction		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
31-05-24	Cementum		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
31-05-24	Feedback EOB I		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-3					
05-06-24	PDL		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
05-06-24	Mandibular 1 st premolar		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
06-06-24	Clinical considerations of cementum		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
06-06-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-06-24	Alveolar bone		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-06-24	Integrated leaning		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-06-24	Feedback EOB I		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-4					
12-06-24	Gingiva-I		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
12-06-24	Mandibular 2 nd premolar		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
13-06-24	Oral histology slides		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
13-06-24	Module test 1		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
14-06-24	Cellular cementum		C1, C2,	Lect, SGD,	MCQ, SEQ,

			C3, P1, P2, A	CBL, Pract	OSPE, VIVA
14-06-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
14-06-24	Gingiva-II		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-5					
10-07-24	Gingiva-II		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
10-07-24	Maxillary 1 st Molar		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
11-07-24	Presentation		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
11-07-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
12-07-24	Principal fibers of PDL		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
12-07-24	Gingiva-III		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
12-07-24	Presentations		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-6					
18-07-24	Presentations		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
18-07-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
19-07-24	Cross section periodontium		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
19-07-24	Integrated learning		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
19-07-24	Presentations		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Program name: BDS					
PLOs (Program Learning Outcomes):					
Year of Study: First Year					
Module Name: Tooth Morphology & Physiology					
Task Force members/Disciplines: Oral Biology, Orthodontics, Operative Dentistry.					
Module coordinator: Dr Abdul Ahad					
Prerequisite:					
Module Rationale:					
Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK-7					
24-07-24	Tooth eruption		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
24-07-24	Type traits of maxillary molars		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
25-07-24	Dentinogingival junction		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
25-07-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
26-07-24	Gingival fibers		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
26-07-24	Tooth eruption		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
26-07-24	Biological width		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-8					
31-07-24	Tooth shedding		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
31-07-24	Mandibular 1 st molar		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
01-08-24	Presentations		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
01-08-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
02-08-24	Dentinogingival junction		C1, C2,	Lect, SGD,	MCQ, SEQ,

			C3, P1, P2, A	CBL, Pract	OSPE, VIVA
02-08-24	Nerve & blood supply of teeth		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
02-08-24	Module test-II		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-9					
07-08-24	Integrated learning		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
07-08-24	Carving video		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
08-08-24	Students ppt(Rescheduled)		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
08-08-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
09-08-24	Microscopy		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
09-08-24	Cell junctions		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
09-08-24	Abnormalities of cell junctions		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-10					
15-08-24	Student projects-I		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
15-08-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
16-08-24	Histological slides		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
16-08-24	TMJ-I		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
16-08-24	TMJ dysfunction		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-11					
21-08-24	TMJ-II		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

21-08-24	Mandibular 2 nd molar		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
22-08-24	Students projects-II		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
22-08-24	Tooth morphology drawings/models		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
23-08-24	Histological slides		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
23-08-24	Revision		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
23-08-24	Student projects -III		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-12					
28-08-24	Revision		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
28-08-24	Revision		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
29-08-24	Student projects		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
30-08-24	Histological slides		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
30-08-24	Integrated learning		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
30-08-24	Student projects		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Program name: BDS PLOs (Program Learning Outcomes):					
Year of Study: First Year Module Name: Paraoral Tissues					
Task Force members/Disciplines: Oral Biology, Oral Pathology, Oral Medicine, OMFS, General Anatomy Module coordinator: Dr Abdul Ahad					
Prerequisite: Module Rationale: Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK-1					
	Salivary Gland-1		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Intro to milk dentition		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Project prep		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Drawings/Models Serous & mucous cell		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Myoepithelial cell & striated duct cell		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Salivary Gland-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Project prep		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-2					
	Physiology of saliva		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Deciduous Incisors		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Project prep		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Drawings/Models Deciduous Incisors		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

	Histological slides Salivary glands		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Mechanism of saliva formation		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Project prep		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-3					
	Ductal modifications		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Deciduous Canines		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Project prep		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Drawings/Models Deciduous Canines		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Histological slides Salivary glands-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Integrated learning	Oral Medicine	C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Project prep		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-4					
	Structure & development of TMJ		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Atypical molars		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Classification of joints		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Drawings/Models Atypical molars		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Anatomy of TMJ		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Biomechanics of TMJ		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

	Clinical correlations TMJ		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-5					
	Integrated learning	Oral Pathology, OMFS	C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Anatomy of pulp canals		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	TMJ ankylosis		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Drawings/Models Atypical molars-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Histology of growing condyle		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Anatomy of maxillary sinus		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Clinical aspect of maxillary sinus		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Program name: BDS PLOs (Program Learning Outcomes):					
Year of Study: First Year Module Name: Oral Mucosa					
Task Force members/Disciplines: Oral Biology, Oral Pathology, Prosthetics, Oral Medicine, Community Dentistry, General Anatomy Module coordinator: Dr Abdul Ahad					
Prerequisite:					
Module Rationale: Module Outcomes (KSA):					
Date	Content/ Topic	Discipline	(KSA, Domain)	Teaching & Learning Strategies	Assessment strategy
WEEK-1					
	Oral mucosa-1		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Oral mucosa-2		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Clinical features of oral mucosa		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Drawings/Models Keratinized epithelium		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Non keratinized epithelium		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Oral mucosa-3		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Age changes		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
WEEK-2					
	Integrated learning	Oral Medicine, Oral Path	C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Integrated learning	Prosthodontics, Community Dentistry	C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Student presentations		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

	Drawings/Models Tongue papilla		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Mucocutaneous junction		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Feedback module test		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA
	Student presentations		C1, C2, C3, P1, P2, A	Lect, SGD, CBL, Pract	MCQ, SEQ, OSPE, VIVA

Learning Objectives:

At the end of the session, first year BDS students should be able to:

	DEVELOPMENT OF TOOTH
1	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
2	Define the following terms/structure: neural crest cells, ectomesenchyme, primary epithelial band, dental lamina, vestibular lamina, tooth bud, lateral lamina, successional lamina, epithelial pearls/Rest cells of Serres, Enamel organ, dental papilla, dental follicle, cervical loop, enamel knot, enamel cord, enamel niche, enamel septum, enamel navel, papillary layer, reduced enamel epithelium, pulp limiting membrane, rest cells of Malassez
3	Identify on a histological picture/slide the following structures: Oral Epithelium, Mesenchyme, Dental lamina, vestibular lamina, tooth bud also draws and label
4	Distinguish, in a table, between dental and vestibular lamina on basis of development, location, histology, function, and fate
5	Explain components/parts of dental lamina on basis of developmental timings & their attachment to primary, permanent and non-succedenous tooth buds
6	Identify components of dental lamina in histological pictures/slides (lateral lamina, successional lamina)
7	Explain the clinical significance of remnants of dental lamina (epithelial pearls) i.e. eruption cysts, odontome, supernumerary tooth
8	Explain histological aspects of bud, cap and bell stages of tooth development with emphasis on cell shapes, types of cell layers and function of each cell layer (outer enamel epithelium, inner enamel epithelium, stratum intermedium, stellate reticulum)
9	Identify draw and label enamel organ, dental papilla and dental follicle along with stages of tooth development in histological pictures (bud, early and late cap stage, early and late bell stage)
10	Describe composition, location, histological appearance (arrangement of fibers, condensation) & fate of dental papilla and dental follicle/sac
11	Describe location, histological appearance (cell shape) & function of enamel knot, enamel cord and enamel niche
12	Identify enamel knot, cord and niche in histological pictures.
13	Discuss importance and process of angiogenesis in relation with the developing tooth germ with reference to location and timings
14	Discuss relation of developing nerve fibers with early tooth germ with reference to location and timings
15	Explain inductive influences of inner enamel epithelial cells of enamel organ and peripheral cells of dental papilla on each other
16	Describe histodifferentiation, function and movement of enamel and dentin forming cells (ameloblasts and odontoblasts) in relation to each other
17	Explain source of nourishment for ameloblasts and odontoblasts during hard tissue formation
18	Describe the formation, histological structure, role and fate (disintegration and rest cells of Malassez) of Hertwig epithelial root sheath in formation of roots of single and multi-rooted teeth
19	Identify draw and label HERS, Rest cells of Malassez and root formation in histological pictures

20	Describe clinical relevance of Hertwig epithelial root sheath (lateral canals/accessory canals formation, cyst development)
21	Explain relevance of root formation and root completion with tooth eruption in oral cavity with emphasis on time required for primary and permanent teeth
22	Explain the abnormalities expected to occur during tooth development in relation with tooth size and number (microdontia, macrodontia, hypodontia, anodontia, supernumery and supplemental teeth)
23	Explain, identify and illustrate the process of tooth development from initiation till root completion along with all the theories and concepts supported by basic molecular aspects
24	Explain the origin and development of tooth supporting structures

	ENAMEL AND AMELOGENESIS
1	Describe physical characteristics of enamel in terms of anatomical location, hardness, thickness, permeability, color, translucency and brittleness
2	Define the following terms/structure: rods, inter-rod, rod sheath, amelogenesis, aprismatic enamel, papillary layer, apoptosis, primary enamel cuticle, reduced enamel epithelium, nasmyth's membrane, neonatal line, striae of retzius, cross striation, perikymata, hunter schreger bands, dentinoenamel junction, enamel tufts, enamel lamellae, enamel spindles, gnarled enamel, pits, enamel caps, focal holes, enamel brochs, attrition, abrasion, erosion
3	Describe embryological origin (from germ layer) and functions of enamel
4	Enlist chemical composition of enamel including percentage of each content
5	Describe and identify key-hole/fish scale pattern of enamel as seen in electron microscope (arrangement of rod, inter-rod and rod sheath) also draw and label
6	Describe dimension, shape, function and growth of enamel crystallites (hydroxyapatite)
7	Describe number, course, orientation, dimension, constituents and significance of enamel rods in primary and permanent teeth
8	Enumerate different morphological and functional phases/stages which an ameloblast passes through during amelogenesis
9	Identify, draw and label ameloblast in different stages of amelogenesis
10	Explain morphogenetic, histodifferentiation and secretory phases of amelogenesis in terms of function, presence/absence of basal lamina, shape, size and arrangement of cells, location and shape of nucleus, presence/absence of mitotic activity and location of junctional complexes
11	Explain formation and location of Tome's process and its role in enamel mineralization during secretory phase of amelogenesis
12	Describe location, formation and function of prismatic and aprismatic enamel

13	Classify enamel proteins according to their function during amelogenesis
14	Describe cell shape, size and volume, protein secreting activity, apoptosis, basal lamina formation seen in ameloblasts during Transition phase of amelogenesis
15	Explain the modulation cycle seen during maturation phase of amelogenesis in terms of significance, changes in morphology and function of ameloblasts, and permeability of junctional complexes
16	Describe process of hydroxyapatite crystal growth and organic content degradation and removal during maturation proper of amelogenesis
17	Describe morphological changes in ameloblasts, during post maturation phase of amelogenesis
18	Discuss incremental growth lines in enamel in terms of daily/weekly growth in um, significance, direction and causes
19	Identify in pictures/histological slides Striae of Retzius in longitudinal and cross section of enamel
20	Explain cause of formation, location and significance of neonatal line in primary and permanent teeth
21	Identify neonatal line in pictures/histological slides of ground section of enamel
22	Describe location, cause, course, histological appearance and number (per um occlusally and cervically) of Perikymata in enamel
23	Describe location, cause of formation, course and histological appearance of Hunter Schreger bands in enamel
24	Identify Perikymata and Hunter Schreger bands in images/pictures
25	Describe histological appearance and significance of Dentinoenamel junction in longitudinal and cross section of a tooth
26	Identify dentinoenamel junction in pictures/slides
27	Describe location, cause of formation, course, distance and content of Enamel Tufts.
28	Identify, draw and label Enamel Tufts in histological pictures of ground section of enamel
29	Explain location, appearance, content and clinical significance of Enamel Lamellae
30	Identify, draw and label Enamel Lamellae in pictures/images
31	Discuss location, appearance, cause of formation, dimension, extension of Enamel Spindles
32	Identify, draw and label Enamel Spindles in pictures/images
33	Describe cause of formation, location and significance of Gnarled enamel
34	Describe size, location and histological appearance, cause of formation of pits, enamel caps, focal holes and enamel brochs

35	Discuss morphological, histological, environmental and functional changes which occur in enamel due to aging
36	Discuss fluorosis, congenital syphilis, amelogenesis imperfecta and its types in terms of clinical presentation and affected stages of amelogenesis
37	Explain and interpret the composition, structure and formation of enamel
38	Understand and explain developmental anomalies and other clinical correlations of enamel
39	Explain the concept of repair of enamel especially in reference to dental caries, erosion and cavity preparation.

	DENTIN AND DENTINOGENESIS
1	Define dentin, predentin, mantle dentin, circumpulpal dentin, primary dentin, secondary dentin, tertiary dentin, reactive dentin, reactionary dentin, dentinogenesis, osteodentin, von Korff's fibers, Hyaline layer, dentinal tubules, dead tracts, peritubular dentin, inter tubular dentin, inter globular dentin, granular layer of tomes, sclerotic dentin, contour lines of Owen, Lines of von Ebner
2	Describe composition by weight and volume, physical properties, innervation, vascularity, permeability, functions and age changes of dentin
3	Describe formation, location, structure, thickness and function of predentin, primary, secondary and tertiary dentin. Also draw and label
4	Discuss process of dentinogenesis in terms of odontoblasts formation and differentiation, role of Hertwig's epithelial root sheath, organic matrix deposition and mineralization
5	Draw and label stages of dentinogenesis
6	Describe Globular and Linear Mineralization in terms of matrix vesicle formation and fusion
7	Tabulate the differences between coronal and radicular dentin in terms of location, formation and orientation of dentinal tubules
8	Identify in histological slides/pictures pre dentin, primary dentin, secondary dentin, tertiary dentin, dentinal tubule, intertubular dentin, peritubular dentin, interglobular dentin, Incremental lines, granular layer of tomes, sclerotic dentin, dead tracts
9	Discuss the dentinal tubules in terms of extension diameter, content and functions
10	Describe and identify location, appearance, cause and significance of interglobular dentin, sclerotic dentin, Granular layer of Tomes. Draw and label granular layer of Tomes
11	Describe different theories to explain the process of dentin sensitivity
12	Explain the basic and histological structure, composition, development, physiology of dentine along with its clinical correlates
13	Explain the concept of repair of dentine-pulp especially in reference to dental caries and cavity preparation

	DENTAL PULP
1	Describe pulp in terms of location, content, developmental origin and function
2	Describe the names, location, content and function of four histological zones seen in dental pulp under microscope
3	Identify, draw and label four histological zones of dental pulp as seen in images/slides.
4	Enlist constituents of dental pulp in terms of cells and extracellular substances
5	Discuss origin, type, size, orientation, and location of collagen fibers in dental pulp
6	Identify, draw and label functional odontoblastic cell at higher magnification
7	Describe location, shape, number, arrangement, function and histological features of odontoblastic cells in a functional tooth
8	Differentiate active and resting odontoblastic cell in terms of histological features and functionality
9	Describe histological features, shape, location and functions of cells present in pulp (fibroblasts, undifferentiated mesenchymal cells, macrophages, dendritic cells, lymphocytes)
10	Describe the orientation, histology, size, type and functions of blood vessels and nerves (myelinated, unmyelinated) in dental pulp
11	Define and identify plexus of Rashkow in terms of histological appearance, location and function
12	Discuss age related changes seen in dental pulp in terms of volume, content, vascularity, innervation, pathology
13	Describe types, formation, location, arrangement, appearance and clinical significance of pulp stones
14	Identify pulp stones in pictures/images
15	Explain the basic and histological structure and zones, composition, development, physiology of pulp along with its clinical correlates

	PERIODONTIUM
1	Define and enumerate the components of periodontium
2	Define cementum, periodontal ligament, gingiva, cemento-enamel junction, Sharpey's fibers, cementoid, cementodentinal junction, hypercementosis, ankylosis, cementicles, lamina dura, bundle bone
3	Describe physical properties of cementum in terms of hardness, location, thickness, function, vascularity, innervation, types, formative cells and permeability
4	Identify cementum in images/slides of ground section of tooth
5	Discuss chemical composition of cementum in %age (inorganic and organic including names of cells, types of collagen fibers and non-collagenous proteins)

6	Classify cementum in terms of presence or absence of cells, origin of collagen fibers (extrinsic and intrinsic) and combination of both
7	Identify in histological pictures/slides also draw and label the different types of cementum
8	Describe the four cementum types (primary, secondary, mixed and acellular) in terms of cells, origin of fibers, location, function, formation/development and mineralization
9	Differentiate intrinsic and extrinsic collagen fibers in terms of formation, location, histology and dimension
10	Classify cemento-enamel junction in terms of enamel and cementum overlapping also discuss clinical significance
11	Describe histological appearance and significance of cementodentinal junction
12	Discuss age related changes occurring in cementum in terms of appearance, thickness, cementicles and repair process
13	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
14	Enumerate the five principal fiber bundles of periodontal ligament
15	Identify in images/histological slides, draw and label, and also describe the location, direction/orientation, origin, insertion and function of principal fibers of periodontal ligament
16	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.
17	Discuss nerve supply of periodontal ligament in terms of names of nerves, types of nerve fibers, location and branching
18	Discuss names, location, histological appearance and function of nerve endings present in periodontal ligament
19	Discuss histological changes seen in supporting system of tooth in increased or decreased function load
20	Define Attached gingiva, free gingiva, gingival sulcus, junctional epithelium, sulcular epithelium, dentogingival junction, Col
21	Identify in images/ patient's gingiva, free gingiva, attached gingiva, col, interdental gingiva
22	Identify in images/histological slides, draw and label, and also describe the location, direction/orientation, origin, insertion and function of principal fibers of gingival ligament
23	Explain the basic and histological structure, composition, development, physiology of periodontium along with its clinical correlates and latest trends
24	Explain the basic concepts and modalities of repair and regeneration of this structure
	SALIVARY GLANDS
1	Define saliva, acini, myoepithelial cell, pellicle, major salivary glands, minor salivary glands
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) and gross anatomy of major and minor salivary glands (location, size, number, name and opening of ducts, nerve supply and blood supply)
3	Identify, on histological slides/images, serous, mucous and mixed salivary glands

4	Describe myoepithelial cells in terms of location, histological appearance (shape, processes) and function
5	Classify ductal system of salivary glands
6	Define sialolith, mucocele, sialadenitis, Sjorgen syndrome, primary saliva, secondary saliva
7	Describe process of ductal modification and regulation of primary and secondary saliva in terms of secretion/reabsorption of electrolytes at different flow rates
8	Describe histological and functional changes in salivary glands due to aging
9	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)
10	Draw and label purely serous and mixed glands
11	Explain the basic and histological structure, composition, development, physiology of salivary glands along with its clinical correlates

	ORAL MUCOSA
1	Define oral mucosa, vermillion border, vermillion zone, vestibule, mucogingival junction, mucocutaneous junction, submucosa
2	Describe boundaries, appearance, texture, histology, functions, age changes, blood supply and nerve supply of oral mucosa
3	Classify and identify (in images/pictures/slides) 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, 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	Identify in histological pictures/images keratinized and non-keratinized epithelium
7	Discuss location, shape, covering epithelium and function of tongue papillae (fungiform, filiform, circumvallate papillae)
8	Identify tongue papillae in histological slides/images
9	Discuss and identify histological features (shape, size, type of cells), location and function of taste bud
10	Define Fordyce spot, linea alba, Odland body, keratohyaline granules, orthokeratinization, parakeratinization, acanthosis, acantholysis, hyperkeratosis, keratinocytes, non-keratinocyte, melanosomes, melanophages
11	Identify Fordyce's granules in pictures/images
12	Describe location, shape, size and significance of Odland bodies/membrane coating granules/lamellar bodies in keratinized and non-keratinized epithelium
13	Describe location, shape, size of keratohyaline granules in keratinized and non-keratinized epithelium
14	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

15	Describe exogenous and endogenous pigmentation in oral cavity with examples (Amalgam tattoo, Burton line)
16	Identify on patients/images junctions in oral cavity (mucogingival, dentogingival, mucocutaneous)
17	Draw and label histology of taste bud
18	Explain the basic and histological structure, composition, development, physiology of oral mucosa along with its clinical correlates
19	Explain concepts of Repair and regeneration of oral mucosa specially in relevance to wound healing of oral mucosa and dentogingival junction

	BONE
1	Define bone, alveolar bone, alveolar process, lamina dura, sharpey'sfibres, bundle bone, supporting bone, cortical bone, spongy bone, interdental bone, inter radicular bone, periosteum, endosteum, osteon, haversian canal, volkman's canal, circumferential lamellae, concentric lamellae, interstitial lamellae
2	Classify bone according to gross appearance and development
3	Discuss histology of compact and spongy bone in terms of formative and resorptive cells (osteoblasts, osteocytes, osteoclasts), lamellae, Haversian and volkman's canals
4	Describe histology and function of osteoblast, osteocyte and osteoclasts
5	Identify in histological slides/images compact and spongy bone.
6	Identify in images/pictures bone cells
7	Describe and identify histological changes and features of intramembranous and intracartilaginous ossification
8	Describe composition, function, regulation, remodeling (phases, normal turnover rate in cortical and trabecular bone, turnover rate in children /adults/old age) and age changes and repair and regeneration of bone
9	Draw and label compact bone histology
10	Explain the basic and histological structure, composition, development, physiology of bone along with its clinical correlates
11	Explain the repair following tooth extraction

	TEMPOROMANDIBULAR JOINT
1	Classify joints (Fibrous, cartilaginous, synovial) according to their morphology
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, 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

	bands/laminae along with their attachment
6	Describe histology, attachment, appearance, vascularity, innervation and function of joint capsule
7	Describe location, extent, function, appearance, histology of synovial membrane (cellular intima and sub intima)
8	Identify, draw and label cellular intima and subintima of synovial membrane
9	Describe formation, appearance, consistency, composition and function of synovial fluid
10	Identify, draw and label Temporomandibular joint showing its different components
	Explain the basic and histological structure, development, physiology of TMJ along with its clinical correlates
	TOOTH ERUPTION AND SHEDDING
1	Define eruption, shedding, pre-eruptive tooth movement, eruptive tooth movement, post eruptive tooth movement, active eruption, passive eruption, Gaubernacular cord, Gaubernacular 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
7	Identify in images/slides also draw and label Gaubernacular cord
8	Identify in images/slides histological section showing union of oral epithelium and reduced enamel epithelium during tooth eruption through soft tissue

	TOOTH MORPHOLOGY AND OCCLUSION:
1	Introduction to Tooth Morphology/ Nomenclature Classify dentition according to shape (homodont, heterodont), sets of teeth (monophyodont, diphyodont, polyphyodont), time period (deciduous, permanent)
2	Discuss time frame and significance of dentition periods (primary, mixed and permanent)
3	Describe dental formulae, sequence of eruption and age of emergence of permanent and deciduous teeth.
4	Discuss commonly used numbering systems (universal, palmer notation and FDI) used in dentistry with examples from primary and permanent teeth
5	Define, identify and differentiate, on tooth specimen/models/images, anatomical crown, clinical crown, anatomical root, clinical root, enamel, dentin, cementum, cervical line, pulp cavity, cusps, tubercles, cingulum,

	ridges (marginal, triangular, transverse, oblique and cusp ridges), inclined plane, mamelons, fossa, developmental (primary) groove, supplemental (secondary) groove, fissure, embrasures, sulcus, pit, contact point, contact area, lobe, line angles, point angles, tooth surfaces (mesial, distal, lingual/palatal, buccal/labial, incisal/occlusal), height of contour
6	Enumerate line and point angles of anterior and posterior teeth.
7	Describe number and significance of lobes in permanent and primary teeth
8	Describe shape, location and function of interproximal spaces, embrasures and contact areas

	PERMANENT INCISORS
1	Tabulate initiation of calcification, completion of enamel and root in terms of months/years
2	Discuss and identify, on models/images/teeth specimen, the general considerations including tooth surfaces, shape of mesial, distal, labial, lingual and incisal outlines, mesiodistal dimensions and contours, inclination of incisal margin, shape of mesioincisal and distoincisal line angles, shape and curvature of cervical margin, number and location of developmental depressions, location and boundaries of lingual fossa, location, shape and inclination of cingulum, location of imbrications lines, marginal ridges, height of contour, contact area
3	Describe number, shape and inclination of root
4	Describe number, location and significance of pulp canals and pulp horns
5	Differentiate, on morphological basis, central and lateral incisor of the same and/or different arch
6	Draw and label incisors from labial, lingual, mesial, distal and incisal aspect
7	Carving of Maxillary central incisor according to natural tooth dimensions on wax block/soap

	PERMANENT CANINES
1	Tabulate initiation of calcification, completion of enamel and root in terms of months/years
2	Describe and identify, on models/images/teeth specimen, the general considerations including tooth surfaces, shape of mesial, distal, labial, lingual and incisal outlines, mesiodistal dimensions and contours, length and inclination of mesioincisal and distoincisal slope, shape and curvature of cervical margin, location, and extent of lingual and buccal ridges, number and location of developmental depressions, location and boundaries of lingual fossae, location shape and inclination of cingulum, marginal ridges, height of contour, contact area
3	Describe number, shape, inclination and variation of root
4	Describe number, location and significance of pulp canals and pulp horns
5	Differentiate, on morphological basis, mandibular and maxillary canine, canine and incisors
6	Draw and label canines from labial, lingual, mesial, distal and occlusal aspect

	PREMOLARS
1	Tabulate initiation of calcification, completion of enamel and root in terms of months/years
2	Describe and identify, on models/images/teeth specimen, tooth surfaces, shape of mesial, distal, buccal, lingual/palatal and occlusal outlines, mesiodistal dimensions and contours, shape and curvature of cervical

	margin, boundaries of occlusal table; number, location, size, variation (U, H and Y type occlusal morphology in case of mandibular 2 nd premolar) of cusps, name, number and location of pits, grooves and fossae, boundaries of fossae, location, size, variations of marginal ridges, height of contour, contact area, mesial concavity, developmental depressions, location and formation of transverse ridge, location and names of cusp ridges and inclined planes,
3	Describe number, shape, inclination and variations of root/roots
4	Describe number, location and significance of pulp canals and pulp horns
5	Differentiate, on morphological basis, mandibular and maxillary premolars
6	Draw and label premolars from buccal, lingual/palatal, mesial, distal and occlusal aspect
7	Carving of Maxillary first premolar according to natural tooth dimensions on wax block/soap

	MOLARS
1	Tabulate initiation of calcification, completion of enamel and root in terms of months/years
2	Describe and identify, on models/images/teeth specimen, tooth surfaces, shape of mesial, distal, buccal, lingual/palatal and occlusal outlines, mesiodistal and buccolingual dimensions and contours, shape and curvature of cervical margin; boundaries of occlusal table, number, location, size, variation of cusps; name, number and location of pits, grooves and fossae, boundaries of fossae, location, size, location of marginal ridges, height of contour, contact area, mesial concavity, developmental depressions, location and formation of transverse ridge, location and formation of oblique ridge in case of maxillary molars, location and names of cusp ridges and inclined planes
3	Describe number, shape, inclination and variations of root/roots
4	Describe number, location and significance of pulp canals and pulp horns
5	Differentiate, on morphological basis, mandibular and maxillary molars, first and second molars of the same arch, molars and other permanent teeth
6	Draw and label first, second and third molars from buccal, lingual/palatal, mesial, distal and occlusal aspect
7	Carving of maxillary and mandibular first permanent molars according to normal tooth dimension on wax block/soap

	DECIDUOUS TEETH
1	Describe general morphological differences between permanent and deciduous teeth
2	Describe and identify, on models/images/teeth specimen, tooth surfaces, shape of mesial, distal, buccal, lingual/palatal and occlusal outlines, mesiodistal and buccolingual dimensions and contours, boundaries of occlusal table, number, location, size, variation of cusps; name, number and location of pits, grooves and fossae, boundaries of fossae, location, size, location of marginal ridges, height of contour, developmental depressions, location and formation of transverse and oblique ridge.
3	Describe number, shape, inclination of root/roots
4	Describe number, location and significance of pulp canals
5	Differentiate, on morphological basis, deciduous incisors vs permanent incisors, mandibular vs maxillary deciduous molars, first vs second molars of the same arch, deciduous vs permanent molars

6	Draw and label deciduous teeth from labial/buccal, lingual/palatal, mesial, distal and incisal/occlusal aspect
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	OCCLUSION
1	Define occlusion, articulation, freeway space (normal value in mm), leeway space (normal value in mm), normal class 1 occlusion (incisal, canine and molar relation), malocclusion (I, II and III), centric occlusion, centric relation, primate space, ugly duckling stage, diastema
2	Describe features of ideal occlusion in terms of spacing, vertical inclination, overjet, overbite, and generalized spacing between the teeth in primary dentition
3	Describe features of ideal occlusion in mixed and permanent dentition
4	Define over jet (along with normal value in mm), increased, decreased, edge-to-edge and reverse overjet
5	Define overbite (along with normal value in mm), deep bite, open bite and closed bite
6	Define three types of molar relations in primary dentition (mesial step, distal step, flush terminal plane)
7	Describe occlusal curvatures (curve of Spee, Wilson and Monsoon) along with formation, direction, shape and significance

	DEVELOPMENTAL AND MORPHOLOGICAL ANOMALIES
1	Define and discuss developmental causes and morphological appearance of effected teeth in anodontia, hypodontia, mesiodens, distodens, macrodontia, microdontia, taurodontium, dilacerations, flexion, germination, fusion, concrescence, segmented roots, dwarfed roots, hypercementosis, accessory cusps, accessory roots, enamel pearls, peg laterals, Talon's cusp, Hutchinson's incisors, Mulberry molars, dens in dente, complex odontoma, compound odontoma, enamel dysplasia, dentin dysplasia, enamel hypoplasia, enamel hypocalcification, enamel hypomaturation, amelogenesis imperfect, mottled enamel, dentinogenesis imperfect, tetracycline staining, Turner's tooth
2	Enlist common anomalies effecting development, size, number and shape of teeth

	ORAL PHYSIOLOGY
1	Describe basic events of speech production (initiation, phonation, articulation) and its neurological control by higher centers
2	Describe mastication in terms of structural apparatus, muscles involved, chewing cycle (opening, closing and occlusal phase) and neurological pathway controlling mastication
3	Enumerate stages of mastication (pull back process of tongue, squeeze back mechanism), and reflexes of mastication (jaw jerk reflex, jaw unloading reflex, jaw open reflex)
4	Discuss stages of swallowing (oral, pharyngeal and esophageal phases), names of higher centers along with neurological pathway controlling it
5	Describe physiology of pain
6	Describe physiology of proprioception
7	Describe composition, pH, volume, function (in terms of effects and components responsible for those effects), formation and secretion of saliva
8	Describe taste pathway along with its neurological control from higher centers

	General and Orofacial Embryology
1	Define fertilization, zygote, embryo, germ layer, notochord, morula, blastocyst, trophoblast, neural crest cells
2	Describe germ layer formation and fate
3	Describe neural crest cells in terms of formation, migration, role in orofacial development and associated anomalies (Treacher Collins syndrome)
4	Enumerate derivatives of ectoderm, endoderm, mesoderm, neural crest cells, pharyngeal arches, pouches and clefts
5	Describe and identify development of face in terms of processes involved and their role in formation of lips, nose, forehead, cheeks and jaws
6	Discuss and 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, mandibular cleft)
7	Describe and 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)
8	Discuss etiological factors responsible for congenital defects effecting facial development
9	Describe the development of tongue
10	Describe development of thyroid gland
11	Describe the developmental of mandible in terms of growth cartilages (names, period of activity, role and fate of primary and secondary growth cartilages), ossification centers, spread of ossification, post-natal growth
12	Describe the formation of different components of mandible condyle, ramus, coronoid process and body of mandible
13	Describe the prenatal growth of maxilla in terms of time frame, processes involved, location of ossification center, spread of ossification, name, location, role and fate of growth cartilages
14	Describe post-natal growth of maxilla in terms of theories associated with growth (functional matrix, cartilage growth, sutural growth), bone remodeling and its impact on growth and position of maxilla
15	Draw and label and identify in images/models both developing and mature mandible bone

	Oral Anatomy
1	Tabulate muscles of facial expressions (corrugator supercilii, orbicularis oris, orbicularis oculi, platysma, buccinators, mentalis, risorius, zygomaticus major and minor, depressor angulioris, depressor labii inferioris, levator labii superior alaeque nasii, procerus, compressor naris, dilator narii, depressor septi) with their origin, insertion, action and nerve supply
2	Tabulate muscles of mastication (temporalis, masseter, lateral pterygoid, medial pterygoid) with their origin, insertion, action and nerve supply
3	Tabulate intrinsic and extrinsic muscles of tongue with their origin, insertion, action and nerve supply
4	Discuss clinical significance of muscles of facial expressions, muscles of mastication, muscles of tongue
5	Describe and identify course and relations of cranial nerves, associated ganglia, functional components

	(SVE,GVE, GVA, SVA, GSA), surface marking, nuclei, branches and clinical significance
6	Describe and identify bones of face in terms of shape, attachments, boundaries, foramina and their content
7	Describe and identify blood supply of face (surface marking, course, branches and anastomosis) and lymphatic drainage of face along with clinical considerations
8	Identify in models/images muscles of facial expressions, muscles of tongue, muscles of mastication, land marks on skull and mandible

List of Recommended & Reference Books

Subject: ORAL BIOLOGY

Oral Anatomy

- Clinical anatomy by regions By Snell, R.S. 10th edition. Lippincott Williams & Wilkins.

General and Oro-facial Embryology

- Langman's medical embryology By Sadler T W. 13th edition. Lippincott Williams & Wilkins.

Oral Histology

- Ten Cate's Oral Histology By Antonio Nanci. 9th edition. Elsevier.
- Oral Anatomy, Histology and Embryology. By B.K.B Berkovitz. 4th edition. MOSBY (Elsevier)
- Handbook of Oral Biology By Zohaib Khurshid. 1st edition. Paramount Books.

Oral Physiology

- Oral Anatomy, Histology, Physiology and Tooth Morphology By K Rajkumar. 2nd edition. Wolters Kluwer (India).

Tooth Morphology and Occlusion

- Concise dental anatomy and morphology By James L Fuller. 4th edition.
- Wheeler's Dental Anatomy, Physiology and Occlusion By Stanley J. Nelson. 11th edition (Elsevier)

Other Learning Resources

Hands-on activities	Students will be involved in practical session and hands-on activities to enhance learning.
Labs	Utilize the lab to relate knowledge to specimens and models available.
Videos	Animated videos of developmental histology to clear the concepts of the students shown during interactive lecture sessions.
Computer lab/CDs/DVDs/Internet resources	To increase the knowledge, students should utilize the available internet resources and CDs/DVDs in main IT lab/personal laptops.
Self-study	Self-study is incorporated to help the student in managing individual tasks/assignments. Student will search for information through available resources.

TOS First Professional BDS Examination (2025)

PAPER – IV

Total Marks: 150 Marks;

- Marks of theory paper = 120
 - Time Allowed = 03 hrs
 - Internal assessment (20%) = 30
 - Pass Marks = 75
 - Part-A: 84 x MCQs (1 mark each) (84 Marks) Time = 1 hr 40 min
 - Part-B: 09 x SAQs (4 Marks Each) (36 Marks) Time = 1 hr 20 min
- Weightings; MCQs (70 %) & SEQs/SAQs (30%)**

Blocks	Themes	Modules	MCQs (68)		Vertically Integrated MCQs (Recall only) (17)	SAQs (9x4)
			Recall	Application		
1 st Block	Essentials of Dentistry I	Orofacial Biology	1	-	-	-
		Oral Mucosa	3	1	1 x Oral Medicine 1 x Prosthodontics 1 x Oral Pathology	1
		Tooth Form & Function	5	5	2 x Orthodontics 2 x Pre-operative	
		Growth & Development	2	1	1 x Orthodontics	1
2 nd Block	Dental & Periodontal Tissues In Health & Disease I	Dental Tissues	12	7	2 x Operative 3 x Oral Pathology 1 x Dental Materials	3
		Periodontal Tissues	4	3	1 x Orthodontics 1 x Periodontology	1
		Tooth Morphology-1	5	2	-	2
3 rd Block	Craniofacial Structures: A Comprehensive Learning I	Tooth Morphology-2	6	2	-	
		Oral Physiology	1	2	1 x Orthodontics	1
		Para-oral Structures	2	2	1 x Oral Medicine	

Total	41	25	18	7
Grand Total	85 (Including Oral Biology & Vertically Integrated LOs)			7

Practical:**INTEGRATED PRACTICAL EXAM CYCLE OF ORAL BIOLOGY**

Subjects	Observed (10 marks each)	Unobserved (6 marks each spot)	Total Marks of OSPE	Viva Voce	IA 20%	Total
Oral Biology	2	4 (2 spot on each station)	44			
IPE	1	1 (2 spot on each station)	16			
Total number of stations=8 (13 spots)	30	30	60	60	30	150

Internal Assessment (2025)

Theory

Subject	Blocks	Continuous assessment (mid modular, modular, class tests, CBLs)	End of Block exam	*Attendance	Student		Teacher's Comments	Pre Annual	Final IA (20%) Marks obtained 150 x 30
		Marks obtained	Marks obtained		Sign	Date			
	Block I	5	10	10				25	
	Block II	5	10	10				25	
	Block III	5		10				10 +25	
*Attendance	> 90 % = 10, 85-89% = 9, 80-84% = 8, 75-79% = 7								

PRACTICAL

Subject	Blocks	Continuous assessment (Practical performance, Assignment completions, Attitude, Ethical work habits, Communication, Practical copy)	End of Block exam	*Attendance	Student		Teacher' s Comments	Pre Annual	Final IA (20%) Marks obtained 150 x 30
		Marks obtained	Marks obtained		Sign	Date			
	Block I	5	10	10				25	
	Block II	5	10	10				25	
	Block III	5		10				10 +25	
*Attendance	<u>> 90 % = 10, 85-89% = 9, 80-84% = 8, 75-79% = 7</u>								