

Department of Oral Biology & Tooth Morphology



**Study Guide
1st year BDS**

**Sharif Medical & Dental College,
Lahore**



PREFACE

The study guide gives an overview of intended course outcomes and objectives in relation to the course content. The assessment methodology tailored to intuitional strategy is provided. This study guide has been carefully designed keeping in view PMC and UHS, Lahore, curriculum and guide lining dedicated effort by faculty is done to make this guide tailored to student's needs. Student's feedback has been seeded and incorporated at all stages during study guide development. Curriculum is a living dynamic entity. Our aim to improve it by every passing day. This humble effort of all faculty acts as a guiding light for our dear students.

This study guide includes schedule of lectures, course outline, learning objectives, the onset of practicals, class assessments, recommended books and other important aspects of Oral Biology for your training. It shall assist you to meet the minimum requirement for a beginner, in the first year of BDS. If you make use of this book and take guidance, it will help you to get a step ahead and discipline yourself for the near future.

The department of Oral Biology welcomes any queries regarding the students' understanding of the subject. It is hoped that students will make maximum use of the opportunities they have been provided with. The department wishes a very bright future to all its students.

This document is an outline for the students to learn and practice Oral Biology in the best way possible. It's informed to all students that no one book is enough to cover the vastness of the subject. For proper learning and practice a student needs to refer to a large variety of books/ literature, along with the lecture and training by their relevant professors.

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VISION & MISSION OF UHS

Qualitative and Quantitative Revolution in Medical Education and Research through Evolution and there by improve Health Care delivery to Populace.

UHS shall be innovative global center of excellence in learning and research, supporting a community of scholars and professionals committed to serving society, promoting the development of students to reach their true potential in becoming competent, ethical, caring, and inquiring health professionals for the benefit of the country and the wider world.

MISSION OF SMDC

Sharif Medical & Dental College is dedicated to best serve the nation through preservation and dissemination of advanced knowledge and educating the students by latest trends in learning and research reaching levels pars excellence.

The Institution is committed to provide standardized quality medical education to its students by inculcating professional knowledge, skills and responsibilities in them with the aim of:

- Preparing them as modern physicians having initiative to act as future leaders in their respective fields and becoming lifelong learners.
- Encouraging the spirit of critical thinking through research and publication.
- Building up an understanding of the ethical values compatible with our religion, culture and social norms.
- Developing a sense of being responsible citizens of the society possessing professional competence and instilling in them the values of hard work and dedication thus preparing them to be accountable to the stakeholders and the state.

The Institution is devoted to keep abreast its faculty with the latest trends in Medical Education encompassing teaching/learning methodologies, assessment tools, research opportunities and professionalism to facilitate their professional development, competencies and commitment towards continues learning.

Our patient-centered mission is achieved by outstanding medical care & services in professional practice with due emphasis and focus on our local health needs.

Our mission further elaborate upon establishing academic and research facilities in areas of local demand under global gold standards and leading advancement in research, education & patient care.

VISION OF SMDC

To be recognized for the provision of a safe and functional environment conducive to collaborative teaching & learning, comfortable working atmosphere, and conducting world class research through professionalism and excellence.



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PLANNED TEACHING ACTIVITIES FOR 1st YEAR BDS DEPARTMENT OF ORAL BIOLOGY

PMC has allocated 160 hours of teaching in the subject of Oral Biology and Tooth Morphology for BDS course. To meet this requirement following teaching modules have been planned. These modules have been carefully designed to impart core knowledge of Oral Biology and Tooth Morphology in a manner that an undergraduate student can grasp the subject fully and is adequately prepared for university examinations.

1. Interactive Lectures:

They will be conducted in lecture halls. Students will be asked questions about previous knowledge, followed by an interactive lecture where students will be engaged in discussion about the current topic. Q/A session will be followed by verbal feedback from teacher.

2. Demonstration on tooth models:

Tooth Morphology and concepts of occlusion will be demonstrated on plaster models in practical lab time. Students will be seated in small groups and will discuss points among themselves, under the supervision of a demonstrator.

3. Practical sessions:

To prepare students for upcoming clinical practice, development of manual hand skills will be initiated in first year students by training them to carve wax/soap models of teeth during practical hours. Students will also draw histologic diagrams on their notebooks during this time.

4. Class activities (Small group discussion & Tutorials):

Students will be exposed to group discussions and question answer sessions with the teachers in small groups in tutorial rooms. These sessions will commence every other week. During this time, small groups, will discuss difficult topics, formative assessment results and paper attempt techniques with their teachers and each other.

5. Class Presentation/ Seminar:

Class presentations will be conducted in the class to allow students to demonstrate their knowledge of an already taught topic. This also helps to improve their presentation skills. Each student will present their assigned topic in front of the class. The presentation will be assessed by peers and feedback will be given by teacher for improvement.

6. Case based learning (CBL):

All basic sciences will be taught with clinical relevance. To facilitate better understanding, case-based discussions will be organized. Students will discuss diseases with respect to basic sciences in small groups. Various dental cases will be shown to students in videos, their findings and management options will be discussed.

7. Self-directed Learning:

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



TRAINING PROGRAM FOR LECTURES DEPARTMENT OF ORAL BIOLOGY & TOOTH MORPHOLOGY

Teaching of all sections of Oral Biology are horizontally integrated with Physiology, Biochemistry and Anatomy. Vertical Integration is done with Operative Dentistry, Orthodontics, Maxillofacial Surgery, General Surgery, Oral Medicine and Periodontology Departments.

Sr No.	Lectures/chapters	Delivered by
1.	Introduction to oral biology Oral Bio Lab/ Batch A	Dr. Zainab Javaid/ Dr. Maaz Ahmed
2.	Introduction to oral biology & General Embryology	Dr. Sadia Rana
3.	Basic concepts of cell, extra cellular matrix, and neural elements	Dr. Sadia Rana
4.	Tooth Morphology/ Chap 1	Dr. Zainab Javaid
5.	Tooth Morphology/ Chap 2	Dr. Maaz Ahmed
6.	TEST (General Embryology & Basic concepts of cell, extra cellular matrix and neural elements)	
7.	Maxillary central incisor	Dr. Maaz Ahmed
8.	Maxillary lateral incisor	Dr. Maaz Ahmed
9.	Mandibular central & lateral incisor	Dr. Zainab Javaid
10.	Oral mucosa	Dr. Zainab Javaid
11.	Test chap 1&2	
12.	Gingiva	Dr. Zainab Javaid
13.	Tooth development	Dr. Sadia Rana
14.	Test Oral Mucosa	
15.	Maxillary canine	Dr. Zainab Javaid
16.	Mandibular canine	Dr. Maaz Ahmed
17.	Test tooth development	
18.	Enamel	Dr. Sadia Rana
19.	Test Anteriors	



20.	dentine	Dr. Sadia Rana
21.	pulp	Dr. Sadia Rana
22.	Test Enamel	
23.	Development of maxilla & mandible	Dr. Sadia Rana
24.	Peridontium	Dr. Sadia Rana
25.	Test dentine& pulp	
26.	Maxillary first premolar	Dr. Zainab Javaid
27.	Maxillary second premolar	Dr. Zainab Javaid
28.	Mandibular first & second premolar	Dr.Maaz Javaid
29.	Test Peridontium	
30.	Salivary gland	Dr. Sadia Rana
31.	Maxillary 1st molar	Dr. Zainab Javaid
32.	Maxillary 2nd& 3rd molars	Dr. Zainab Javaid
33.	Mandibular 1st molar	Dr.Maaz Ahmed
34.	Test salivary gland	
35.	TMJ	Dr. Sadia Rana
36.	Test Posteriors	
37.	Eruption & Shedding	Dr. Zainab Javaid
38.	Test TMJ	
39.	Oral physiology	Dr. Sadia Rana



SPECIFIC LEARNING OBJECTIVES (SLO's)

At the end of the course the student should be able to:

S. NO	CONTENT/TOPICS	SPECIFIC LEARNING OBJECTIVES
1.	TOOTH MORPHOLOGY	<ol style="list-style-type: none"> 1. Define morphological terms related to teeth and oral cavity (nomenclature). 2. Describe various tooth numbering and identification systems. 3. Identify and differentiate all the teeth of Deciduous and Permanent human Dentition. 4. Identify and explain maxillary and mandibular Permanent Incisors. 5. Identify and explain maxillary and mandibular Permanent Canines. 6. Identify and explain maxillary and mandibular Permanent Premolars. 7. Identify and explain maxillary and mandibular Permanent Molars. 8. Identify and explain Deciduous Dentition. 9. Comprehend Pulp Cavities. 10. Compare occlusion at the time of primary, mixed and permanent dentitions.
2.	OCCLUSION	<ol style="list-style-type: none"> 1. Explain points of ideal occlusion. 2. Describe the types of malocclusions. 3. Explain the types of dentitions. 4. Understand the phenomenon of over jet, overbite, curve of spee, curve of monsoon and curve of Wilson
3.	ORAL EMBRYOLOGY	<ol style="list-style-type: none"> 1. Comprehend and describe the process of cell division (mitosis and meiosis) and gametogenesis. 2. Understand and describe fertilization, cleavage, blastocyst formation and implantation of the embryo (1st week of development). 3. Comprehend and describe stages of early embryonic development at second and third week of intrauterine life. 4. Describe the formation of Pharyngeal arches, pouches, and clefts. 5. Explain the Birth defects involving the Pharyngeal Region. 6. Comprehend the development and clinical correlation of Tongue. 7. Explain the development and clinical correlations of Thyroid Gland. 8. Discuss the development and clinical correlation of Facial Region. 9. Describe the development and clinical correlations of Soft and Hard Palate. 10. Explain the development and Clinical Correlations of



		Nasal Cavities.
4.	ORAL PHYSIOLOGY	<ol style="list-style-type: none"> 1. Describe the composition and functions and of Saliva. Explain clinical significance of Salivary flow rate. 2. Describe the phenomenon of Taste and its clinical correlations. 3. Describe the phenomenon of Smell and its clinical correlations. 4. Describe the phenomenon of Mastication and Swallowing and their clinical correlations. 5. Describe the phenomenon of Pain and Proprioception. 6. Describe the phenomenon of Speech. 7. Describe Plaque and Calculus and their clinical Significance.
5.	ORAL HISTOLOGY	<ol style="list-style-type: none"> 1. Oral Mucosa. <ol style="list-style-type: none"> a) Explain the anatomy of Oral Mucosa. b) Describe the Histology of Oral Mucosa. c) Enlist the Functions of Oral Mucosa. d) Classify different Types of Oral mucosa. e) Comprehend the Age changes and Clinical Correlations of Oral Mucosa. 2. Development of Tooth and its Supporting Structures. <ol style="list-style-type: none"> a) Explain the Primary changes in the Oral Epithelium. b) Identify and explain the Stages of tooth development. c) Describe the Tooth root development. d) Describe the Nerve and vascular supply during tooth development 3. Enamel. <ol style="list-style-type: none"> a) Explain the Composition, formation, and functions of Enamel. b) Describe the Histology of Enamel. c) Comprehend the Age changes and Clinical Correlations of Enamel 4. Dentino-Pulp Complex. <ol style="list-style-type: none"> a) Describe the Composition of Dentine and Pulp. b) Explain the Formation and Functions of Dentine and pulp. c) Classify different Types of Dentine. d) Explain the Histology of Dentine and Pulp. e) Comprehend the Age changes and clinical Correlations of Dentine and Pulp. 5. Periodontium. <ol style="list-style-type: none"> a) Explain different Components of Periodontium. b) Describe the Composition and functions of Cementum, periodontal Ligaments, Alveolar Bone and Gingiva. c) Elaborate the Structure and Histology of Cementum, Periodontal Ligaments,

		<p>Alveolar Bone and Gingiva.</p> <p>d) Comprehend Age changes and Clinical Correlations of Periodontium.</p> <p>6. Alveolar Bone:</p> <p>a) Describe parts of alveolar bone.</p> <p>b) Describe gross bone histology.</p> <p>c) Describe bone cells.</p> <p>d) Describe bone development.</p> <p>e) Describe bone turnover.</p> <p>f) Describe bone grafts.</p> <p>7. Repair and Regeneration of Oral Tissues.</p> <p>a) Understand the Mechanism and Histology of wound healing of Oral Mucosa.</p> <p>b) Explain the Histology of repair of Enamel.</p> <p>c) Describe the Histology of repair of dentino-pulp complex.</p> <p>d) Describe the Histology of repair of periodontium.</p> <p>8. Physiologic tooth movement: Eruption and Shedding.</p> <p>a) Explain the Mechanism and histology of Eruptive tooth movements.</p> <p>b) Define and explain the Factors effecting the post eruptive tooth movements.</p> <p>c) Understand and describe the Histology of the Shedding of the teeth.</p> <p>d) Comprehend the Abnormal tooth movements.</p> <p>e) Explain the Orthodontic tooth movements.</p>
6.	ORAL ANATOMY	<p>1. Temporomandibular Joint.</p> <p>a) Classify the Joints.</p> <p>b) Understand the Anatomy and Histology of TMJ and its Components.</p> <p>c) Acknowledge the Origin, insertion, and functions of muscles of mastication.</p> <p>d) Explain the Biomechanics of muscles of mastication.</p> <p>e) Identify and explain the Innervations and Blood supply of muscles of mastication.</p> <p>and TMJ</p> <p>f) Interpret the Clinical significance of TMJ.</p> <p>2. Salivary Glands.</p> <p>a) Describe the Anatomy, development, and functions of Salivary Glands.</p> <p>b) Explain the Histology of major salivary glands.</p> <p>c) Develop an understanding of the Histology of minor salivary glands.</p> <p>d) Define saliva, its Formation, and its modification.</p> <p>e) Understand the Age changes and clinical considerations of salivary glands.</p>



LIST OF PRACTICALS /LAB WORK:

DEMONSTRATOR	LIST OF PRACTICAL WORK
Dr. Zainab Javaid Dr. Maaz Ahmed	How to operate microscope
	Introduction to tooth carving instruments
	Introduction to Tooth carving
	Carving of maxillary central incisors
	Carving of maxillary 1 st premolars
	Carving of maxillary 1 st molar
	Carving of mandibular 1 st molar
	Oral histology slides
Model study	
Dr. Sadia Rana Dr. Zainab Javaid Dr. Maaz Ahmed	Discussion

LAB WORK

- Practical graph book illustration.
- Plaster model demonstration of dentition, covering all tooth aspects.
- Preparation of ground tooth sections.
- Tooth model preparation on wax.
- Oral Histology Notebook.



ASSESSMENT PLAN DEPARTMENT OF ORAL BIOLOGY

Following modes of assessment are planned for 1st year BDS class in the subject of Oral Biology and Tooth Morphology. This plan has been designed keeping in view the university curriculum and hopefully will facilitate the students in preparing for 1st professional examinations in the subject.

Chapter Tests:

These will be conducted at the completion of every chapter. The test will comprise of MCQs, SEQs, and OSPE on the pattern of university examinations. A preparatory time of at least 10 days shall be given prior to these tests.

Pre-tutorial Tests:

Tutorial topics will be notified minimum one week before the tutorial class. A small test of 10 -15 minutes duration, comprising of MCQs, true or false statements or fill in the blanks will be held before the start of each tutorial. The topic will be then discussed by a senior instructor in detail. This will be an interactive session. The paper of the PTT will be marked by demonstrators in quick time and the papers will be returned before the conclusion of each class.

Term Tests:

Two term tests shall be conducted in coordination with other subjects. This will comprise of theory; practical and viva segments and a sizeable portion of the total course will be included in each of them.

Pre-annual Exam:

This will be undertaken in coordination with other departments, exactly following the format of university professional examinations. It will comprise of MCQs, SEQs, OSPE and Viva voce.

Internal Assessment:

Internal assessment will be calculated out of 20 based on all these tests that will be conducted throughout the year.



STAFF CONTACTS
ORAL BIOLOGY DEPARTMENT SMDC, LAHORE

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PRESCRIBED TEXT BOOKS & REFERENCES

RECOMMENDED BOOKS:

- Oral Histology- Development, Structure and Function by A.R. Ten Cate. 8th Edition
- Orban's Oral Histology and Embryology. S.N. Bhaskar Concise Dental Anatomy and Morphology. Tooth morphology by James L Fuller.
- Wheeler's Dental Anatomy and Morphology, Major M. Ash
- Essentials of Oral Histology and Embryology by Avery
- Oral Physiology by Levalle
- Essentials of Oral Physiology by Robert M Bradley

REFERENCE BOOKS:

- Oral Physiology for Dental Students. Johnson and Moore. Oral Physiology.
- Christopher Lavelle An Atlas of Oral Anatomy, Berkivitz, G. R. Holland.