



Al-Badar Educational & Charitable Trust's
AL-BADAR RURAL DENTAL COLLEGE & HOSPITAL, KALABURAGI

Affiliated to Rajiv Gandhi University of Health Sciences Bangalore &
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Session Plan I BDS (2020-21)

**Paper Title: Human Oral And Dental Anatomy, Embryology,
Physiology And Histology**

Learning Outcomes:

At the end of the human oral and dental anatomy, embryology, physiology and histology course, the student should be able to comprehend-

1. The anatomy, morphology, chronology, functions, nomenclature of primary and permanent dentition
2. Tooth numbering system for primary and permanent dentition
3. The anatomy of temporo mandibular joint and occlusion
4. The development of face, jaw and teeth
5. Histology of different tissues of oral cavity
6. Histochemistry of oral tissues
7. Blood supply, nerve supply and lymphatic drainage of teeth and surrounding tissues

Sl no	Unit	Topic	Lecture hour	Teaching pedagogy	Resources
1.	Introduction, dental anthropology and comparative dental anatomy	Introduction, dental anthropology and comparative dental anatomy	Theory – 1	Lecture	T3 chapter – 1,4
2.	Functions of teeth	Functions of teeth	Theory – 1	Lecture	T3 chapter – 4
3.	Tooth numbering	Tooth numbering	Theory – 1	Lecture	T3 chapter – 1
4.	Cell	Structure and function	Theory – 1	Lecture	T4 chapter – 9
5.	Nomenclature	Nomenclature	Theory – 1	Lecture	T3 chapter – 9
6.	Development and growth of face and jaws	Development and growth of face and jaws	Theory – 1	Lecture	T1 chapter – 2 T2 chapter – 2 W1
7.	Chronology of deciduous and permanent teeth	Chronology of deciduous and permanent teeth	Theory – 1	Lecture ICT based demo	T3 chapter – 2
8.	Deciduous teeth	Deciduous teeth	Theory – 4	Lecture ICT based demo	T3 chapter – 3

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9.	Gross morphology of deciduous teeth	Gross morphology of deciduous teeth	Theory – 2	Lecture ICT based demo	T3 chapter – 3
10.	General Difference between deciduous and permanent teeth	General Difference between deciduous and permanent teeth	Theory – 1	Lecture ICT based demo	T3 chapter – 3
11.	Development of tooth	Dental lamina, Developmental stages, histophysiology, clinical considerations	Theory – 6	Lecture ICT based demo videos	T1 chapter – 9 T2 chapter – 7 W1
		Developmental stages	Practical – 5	Individual learning group discussion ICT based seminar Tutorials Assignments	Hand outs Led screen Microscopic slides
12.	Morphology of permanent teeth	Morphology of maxillary and mandibular incisors, Morphology of maxillary and mandibular canines, Morphology of maxillary and mandibular premolars, Morphology of maxillary and mandibular molars	Theory – 6	Lecture ICT based demo videos	
	Incisors, canines, premolars and molars		Practical – 250	Individual learning group discussion ICT based seminar Tutorials Assignments	Hand outs Led screen Microscopic slides



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13.	Enamel	Physical and chemical properties of enamel, Structure of enamel, Development - life cycle of ameloblasts, Amelogenesis, Mineralization, Clinical considerations, Age changes	Theory – 8	Lecture ICT based demo Videos	T1 chapter 6 T2 chapter 3 W1 W2
			Practical - 6	Individual learning group discussion ICT based seminar Tutorials Assignments	Hand outs Led screen Microscopic slides
14.	Morphological differences of the same arch	Morphological differences between the maxillary central and maxillary lateral, Morphological differences between the mandibular central and mandibular lateral, Morphological differences between the maxillary 1 st premolar and maxillary 2 nd premolar, Morphological differences between the mandibular 1 st premolar and mandibular 2 nd premolars,	Theory – 9	Lecture	T3 chapter 6 Models

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		Morphological differences between the maxillary 1 st molar and maxillary 2 nd molar, Morphological differences between the mandibular 1 st molar and mandibular 2 nd molar			
15.	Dentin	Physical and chemical properties of dentin, Structure of dentin – types, Development of dentin – dentinogenesis, mineralization, Clinical considerations, Age changes	Theory – 5	Lecture ICT based demo videos	T1 chapter – 5 W1 W2
			Practical – 10	Individual learning group discussion ICT based seminar Tutorials Assignments	
16.	Morphological differences of opposite arch	Morphological differences between the maxillary and mandibular incisors, Morphological differences between the maxillary and mandibular canines, Morphological differences	Theory – 4	Lecture	T3 chapter – 1

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		between the maxillary and mandibular premolars, Morphological differences between the maxillary and mandibular molars			
17.	Pulp	Anatomy, structural features, functions and cells of pulp, Development, clinical considerations and age changes	Theory – 5	Lecture	T1 chapter – 6 T2 chapter – 10 W1
			Practical – 2	Individual learning group discussion ICT based seminar Tutorials Assignments	Hand outs Led screen Microscopic slides
18.	Cementum	Physical and chemical properties of cementum, Structure and development of cementum, Clinical considerations, age changes	Theory – 5	Lecture ICT based demo	T1 chapter – 7,5 T2 chapter – 13 W1 W2
			Practical – 6	- Individual learning, group discussion ICT based seminar Tutorials Assignments	Hand outs Led screen Microscopic slides
19.	Periodontal ligament	Development and functions of pdl, Cells and fibers of pdl, Clinical	Theory – 5	Lecture ICT based demo	T1 chapter – 8 T2 chapter – 13,14

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		considerations, age changes			
			Practical – 1	Individual learning group discussion ICT based seminar Tutorials Assignments	Hand outs Led screen Microscopic slides
20.	Internal anatomy of pulp	Pulp chambers and canal, pulp horn	Theory – 1	Lecture	T3 chapter – 30
21.	Oral mucous membrane	Definition and general considerations, Structure and microscopic appearance, Classification and functions, Gingival sulcus and dento gingival junction, Clinical considerations and age changes	Theory – 8	Lecture	T1 chapter – 10 T2 chapter – 18 W1
			Practical – 9	Individual learning, group discussion ICT based seminar Tutorials Assignments Projects	Hand outs Led screen Microscopic slides
22.	Salivary glands	Classification, Structure and histology, Functions, Clinical considerations, age changes	Theory – 4	Lecture ICT based demo	T1 chapter – 11 T2 chapter – 17 W1 W2
			Practical – 3	Individual learning, group discussion	Hand outs Led screen Microscopic slides

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				ICT based seminar Tutorials Assignments	
23.	Bone	Physical and chemical properties of bone, Structure of bone, Development and internal reconstruction of bone, Clinical considerations	Theory – 5	Lecture ICT based demo videos	T1 chapter – 5,9 T2 chapter – 13,14
			Practical – 10	Individual learning group discussion ICT based seminar Tutorials Assignments	Hand outs Led screen Microscopic slides
24.	Occlusion	Development of occlusion, dental arch form, compensating curves of dental arches, Angulations of individual teeth in relation to various planes, Functional form of the teeth at their incisal and occlusal thirds, Facial relations of each tooth in one arch to its antagonist, Occlusal contact and intercusp relations of all teeth	Theory – 7	Lecture videos	T3 chapter – 16
25.	Tooth eruption	Patterns and histology of tooth movement, Mechanism of tooth movement	Theory – 2	Lecture ICT based demo	T1 chapter – 13 T2 chapter – 15



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		and clinical considerations			
26.	Shedding of deciduous teeth	Pattern and histology of shedding, Mechanism of resorption and shedding, clinical considerations	Theory – 2	Lecture ICT based demo	T1 chapter – 14 T2 chapter – 15
27.	Theories of calcification	The theories of calcification	Theory – 1	Lecture	T1 chapter – 9 T2 chapter – 7
28.	Temporo mandibular joint	Gross anatomy, muscles of mastication, mandibular movements, histology and clinical considerations	Theory – 1	Lecture	T3 chapter – 15
29.	Histochemistry Of oral Tissues	Histochemical study of oral tissues, Histochemical technique,	Theory – 4	Lecture ICT based demo	T1 chapter – 18
30.	Mastication & deglutition	Muscles of mastication, deglutition	Theory – 1	Lecture	T3 chapter – 1
31.	Cranial nerves	5 th , 7 th , 9 th cranial nerves	Theory – 1	Lecture	T1 chapter – 9
32.	Blood, nerve and lymphatic drainage of teeth and surrounding tissues	Blood, nerve and lymphatic drainage	Theory – 1	Lecture	T1 chapter – 25
33.	Maxillary sinus	Definition and variations, Structure and Histology, Functions and Clinical considerations	Theory – 1	Lecture ICT based demo	T1 chapter – 16 W1
			Practical – 10	Individual learning group discussion	Hand outs Led screen Microscopic slides

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				ICT based seminar Tutorials Assignments	
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Resources:

Textbooks

- T1. Orban's - oral histology and embryology – SN bhaskar 15th Edition
T2. A.R Tencates – oral histology, development, structure and function 8th Edition
T3. Wheeler's dental anatomy, physiology and occlusion – Nelson /Ash 9th Edition
T4. Human Physiology Vol – I. Chatterjee C. C.
T5. Cunningham's Manual of practical Anatomy (Vol-I) 1998 ELBS Oxford

Web link

- W1. <https://teachmeanatomy.info/the-basics/embryology/head-neck/face-palate/>
W2. <https://openoregon.pressbooks.pub/histologyandembryology/chapter/chapter-8-tooth-development>
W3. <https://www.youtube.com/watch?v=RyelOpCS0Uo>
W4. <https://www.youtube.com/watch?v=RyelOpCS0Uo>
W5. J dent res. 1952 jun;31(3):366-70.doi: 10.1177/00220345520310031401
W6. Front biosci (elite ed). 2011 jan 1; 3: 711–735. 2011 jan 1
W7. International journal of science and research (ijsr) issn (online): 2319-7064 index copernicus value (2015): 78.96 | impact factor (2015): 6.391
W8. International journal of science and research (ijsr) issn (online): 2319-7064 index copernicus value (2015): 78.96 | impact factor (2015): 6.391
W9. J indian soc periodontol. 2014 sep-oct; 18(5): 549–554
W10. International journal of science and research (ijsr) issn (online): 2319-7064 index copernicus value (2015): 78.96 | impact factor (2015): 6.391
W11. <https://www.youtube.com/watch?v=fofiZa7xlo0>
W12. Delporte C, Bryla A, Perret J. Aquaporins in Salivary Glands: From Basic Research to Clinical Applications. Int J Mol Sci. 2016 Jan 27;17(2)
W13. The American Journal of Surgical Pathology: October 2009 - Volume 13 - Issue 10 - p 879-899

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W14. "The composition, function and role of saliva in maintaining oral health:

A review," Int J Contemp Dent Med Rev, vol.2017, Article ID: 011217, 2017

Questions bank

Short questions

1. Functions of teeth
2. Tooth numbering system
3. Structure and function of cell
4. Development of face
5. Development of mandible
6. Morula
7. Blastula
8. Neural crest cells
9. Pharyngeal arches and pouches and their derivatives
10. Meckel's cartilage
11. Development of tongue
12. Development of palate
13. Notochord
14. Chronology of teeth
15. Chronology of deciduous teeth
16. Sequence of emergence of primary teeth
17. Transition dentitional period
18. Differences between primary and permanent teeth
19. Incremental lines of enamel
20. Hypocalcified structures of enamel
21. Age changes of enamel
22. Enamel rods
23. Types of dentin
24. structure of dentinal tubules
25. Age changes in dentin
26. Physical and chemical properties of dentin
27. Dento enamel junction
28. Function of pulp
29. Age changes in pulp
30. Cells of pulp
31. Zone of weil
32. Pulp stones
33. Types of cementum
34. Hypercementosis
35. Functions of cementum
36. Types of cemento enamel junction



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37. Age changes in cementum
38. Epithelial rests of mallassez
39. Cementicles
40. Functions of pdl
41. Sharpey's fibers
42. Pulp chambers
43. Pulp horn
44. Write in brief about non keratinocytes
45. Discuss layers in keratinized epithelium of keratinized mucosa
46. Vermillion border of lip
47. Histology of gingiva
48. Taste buds
49. Specialized mucosa
50. Papilla of tongue
51. Lip mucosa
52. Histological difference between keratinized and non keratinized mucosa
53. Clinical features of gingiva in detail
54. Types of gingiva and its appearance
55. Orthokeratized epithelium
56. Junctional epithelium
57. Histology of skin
58. Strata in keratinized epithelium
59. Age changes in oral mucosa
60. Development of dento gingival junction
61. Epithelial attachment
62. Odland bodies
63. Mast cells
64. Incisive papilla
65. Attached gingiva
66. Tonofilaments
67. Lamina propria
68. Lamina limitans
69. Col
70. Linea alba
71. Fordyce's granules
72. Cytokeratins and their significance
73. Functions of saliva
74. Composition of saliva
75. Describe the histology of serous glands
76. Histology of salivary glands
77. Ducts of salivary glands
78. Deminules

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79. Von Ebner glands
80. Myoepithelial cells
81. Histology of serous cells
82. Goblet cells
83. Stenson duct
84. Alveolar bone proper
85. Bundle bone
86. Resting lines
87. Reversing lines
88. Osteoblasts, osteoclast, osteocytes
89. Bay like recess
90. Composition of bone
91. Osteon
92. Lamina dura
93. Howships lacunae
94. Osteoid
95. Internal reconstruction of bone
96. Centric occlusion
97. Key of occlusion
98. Compensatory curves of dental arches
99. Freeway space
100. Leeway space of nance
101. Curves of Wilson
102. Curve of spee
103. Theories of tooth eruption
104. Pre eruptive tooth eruption
105. Gubernacular cord and canal
106. Fibronexus
107. Histology of shedding
108. Odontoclasts
109. Theories of calcification
110. Write in brief histology of TMJ
111. Muscles of mastication
112. Anatomy of TMJ
113. Curve of spee
114. Functions of TMJ
115. Articular disc
116. Synovial membrane and synovial fluid
117. Decalcification of tissue specimens
118. Fixation of tissue specimen
119. Ground sections
120. Fixatives

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121. Muscles of mastication
122. Deglutition
123. Oral and pharyngeal phase of deglutition
124. Functions of maxillary sinus
125. Histology of maxillary sinus
126. Goblet cells
127. Oro antral fistula

Long questions

1. Morphology of maxillary incisors
2. Morphology of mandibular incisors
3. Morphology of maxillary canines
4. Morphology of mandibular canines
5. Morphology of maxillary premolars
6. Morphology of mandibular premolars
7. Morphology of maxillary molars
8. Morphology of mandibular molars
9. Discuss amelogenesis in detail
10. Enumerate the stages in the life cycle of ameloblasts
11. Write in detail structure of enamel and add a note on clinical considerations
12. Morphological differences between the maxillary central and maxillary lateral
13. Morphological differences between the mandibular central and mandibular lateral
14. Morphological differences between the maxillary 1st premolar and maxillary 2nd premolar
15. Morphological differences between the mandibular 1st premolar and mandibular 2nd premolars
16. Morphological differences between the maxillary 1st molar and maxillary 2nd molar
17. Morphological differences between the mandibular 1st molar and mandibular 2nd molar
18. Describe dentinogenesis
19. Describe the theories of dentin hypersensitivity
20. Write in detail structure of enamel and add a note on clinical considerations
21. Morphological differences between the maxillary central and mandibular central incisors
22. Morphological differences between the maxillary and mandibular lateral incisors
23. Morphological differences between the maxillary canine and mandibular canine
24. Morphological differences between the maxillary 1st premolar and mandibular 1st premolar
25. Morphological differences between the maxillary 2nd premolar and mandibular 2nd premolar

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26. Morphological differences between the maxillary 1st molar and mandibular 1st molar
27. Morphological differences between the maxillary 2nd molar and mandibular 2nd molar
28. Enumerate the zones of pulp, histology of dental pulp, add a note on blood vessels of pulp
29. Describe difference between acellular and cellular cementum
30. Describe the chemical and physical properties and classification of cementum
31. Describe the fibers of pdl and write about the synthetic and resorptive cells of pdl
32. Classify OMM and write in detail about histology of masticatory mucosa
33. Discuss light and ultra microscopic appearance of gingiva
34. Classify OMM describe light microscopic and ultra structural features of keratinized and non keratinized stratified squamous epithelium of oral mucosa
35. Discuss the formation of dento gingival junction
36. Define OMM, classify OMM, discuss the specialized mucosa of the oral cavity
37. Describe lining mucosa, add a note on gingival fibers
38. Shift of dento gingival junction and its clinical significance
39. Classify salivary glands, discuss serous and mucous salivary glands with a neat labelled diagram
40. Difference between serous and mucous salivary glands
41. Classify salivary glands and duct

Topics for seminar

- Topic 1. Development of mandible
- Topic 2. Development of tongue
- Topic 3. Chronology of deciduous teeth
- Topic 4. Life cycle of ameloblasts
- Topic 5. Amelogenesis
- Topic 6. Age changes in enamel
- Topic 7. Dentinogenesis
- Topic 8. Dentin hypersensitivity
- Topic 9. Types of dentin
- Topic 10. Cells of pulp
- Topic 11. Types of cementum
- Topic 12. Fibers of PDL
- Topic 13. Cells of PDL
- Topic 14. Functions of PDL
- Topic 15. Classification of OMM
- Topic 16. Gingiva
- Topic 17. Keratinocytes and non keratinocytes
- Topic 18. Papilla of tongue
- Topic 19. Composition and function of saliva
- Topic 20. Classification of salivary glands



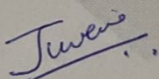
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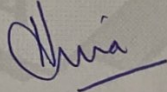
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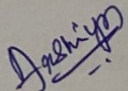
- Topic 21. Ductal system
- Topic 22. Alveolar bone proper
- Topic 23. Theories of tooth eruption
- Topic 24. Pattern of shedding
- Topic 25. Anatomy of maxillary sinus

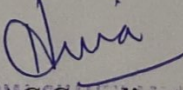
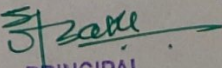
Topic for group discussion

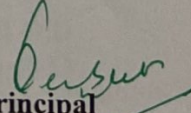
- Topic 1. Taste buds
- Topic 2. Papilla of tongue
- Topic 3. Structure of enamel
- Topic 4. Structure of dentin
- Topic 5. Zones of pulp
- Topic 6. Pulp stones
- Topic 7. Cement enamel junction
- Topic 8. Hypercementosis
- Topic 9. Sharpey's fibers
- Topic 10. Parakeratinized epithelium
- Topic 11. Orthokeratinized epithelium
- Topic 12. Skin
- Topic 13. Mucous acini
- Topic 14. Serous acini
- Topic 15. Haversian canal
- Topic 16. Lining of maxillary sinus


Staff Incharge


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