



**MODULE 4**  
**CERVICO-FACIAL MODULE**  
**1<sup>st</sup> Year BDS**

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## Vision & Mission

### **Khyber Medical University (KMU) Vision:**

Khyber Medical University will be the global leader in health sciences academics and research for efficient and compassionate health care.

### **Khyber Medical University (KMU) Mission:**

Khyber Medical University aims to promote professional competence through learning and innovation for providing comprehensive quality health care to the nation.

### **Institute of Health Professions Education & Research (IHPER) Mission:**

To produce leaders, innovators and researchers in health professions education who can apply global knowledge to resolve local issues.

## Themes

S#	Theme	Duration in Weeks/days
1.	Neck Pain	3 days (18hrs)
2.	Neck Swelling	3 days (19hrs)
3.	Earache & Imbalance	2 days (11hrs)
4.	Difficulty in Chewing	1 week (33hrs)
5.	Cervical Spondylosis	3 days (18hrs)
<b>Total</b>		<b>3 weeks (99hrs)</b>

## Teaching Hours Allocation

S. No	Subject	Hours
1.	Anatomy Histology = 2 Gross Anatomy = 38 Neuroanatomy = 10	50
2.	Physiology	20
3.	Oral Biology & Tooth Morphology	25
4.	Biochemistry	1
5.	Oral Maxillofacial	2
6.	General Medicine	1
<b>Total</b>		<b>99</b>

## Learning Objectives

By the end of this Module, 1<sup>st</sup> year BDS students will be able to:

1. Identify the anatomical structures of the neck.
2. Discuss the development, histology, structure, and common diseases associated with thyroid and parathyroid gland.
3. Describe the development, histology, structure, and function of ear.
4. Discuss the structure, function, and diseases of the muscles, joints, and other tissues involved in mastication.
5. Define occlusion and malocclusion.
6. Discuss the structure and features of mandibular pre-molars and molars.
7. Classify impression materials and demonstrate manipulation of impression materials.
8. Discuss the classification, structure, function, biochemical properties, pathology and management of salivary glands.
9. Discuss the histology, structure, biochemical properties and function of cervical spine.

Theme 1: Neck Pain			
Subject	Topic	Hours	Learning Objective
Gross Anatomy	Hyoid Bone	1hr	<ol style="list-style-type: none"> <li>1. Describe the structure of the hyoid bone.</li> <li>2. Describe muscle attachments of hyoid bone.</li> <li>3. Explain the clinical implications.</li> </ol>
	Anterior Triangle of Neck	2hrs	<ol style="list-style-type: none"> <li>4. Describe superficial fascia and deep fascia.</li> <li>5. Enlist subdivisions of anterior triangle of neck               <ol style="list-style-type: none"> <li>a. Submental Triangle</li> <li>b. Digastric triangle</li> <li>c. Carotid Triangle</li> <li>d. Muscular Triangle</li> </ol> </li> <li>6. Describe boundaries of anterior triangle of neck.</li> <li>7. Describe content of anterior triangle of neck.</li> <li>8. Describe boundaries of carotid triangle of neck.</li> <li>9. Describe content of carotid triangle of neck.</li> <li>10. Describe boundaries of muscular triangle.</li> <li>11. Enlist contents of muscular triangle.</li> <li>12. Describe attachments, nerve supply and actions of infrahyoid muscles.</li> <li>13. Enumerate clinical problems related to anterior neck region.</li> </ol>
	Posterior Triangle	1hr	<ol style="list-style-type: none"> <li>14. Describe boundaries of posterior triangle.</li> <li>15. Enlist divisions of posterior triangle.</li> <li>16. Explain contents of posterior triangle.</li> <li>17. Discuss swelling of supraclavicular lymph nodes.</li> </ol>
	Pharynx	1hr	<ol style="list-style-type: none"> <li>18. Describe boundaries of pharynx.</li> </ol>

		<p>19. Enlist parts of pharynx and compare them.</p> <p>20. Describe structure of pharynx.</p> <p>21. Describe structures passing between pharyngeal muscles.</p> <p>22. Describe origin, insertion of constrictors of pharynx.</p> <p>23. Explain Waldeyer's lymphatic ring.</p>
Pharyngeal Spaces	1hr	24. Explain types of pharyngeal spaces.
Larynx	2hrs	<p>25. Describe gross features of larynx, cartilages membranes and muscles.</p> <p>26. Enlist muscles which cause movement of larynx.</p> <p>27. Describe movements of vocal cords.</p> <p>28. Describe blood supply of vocal cords.</p> <p>29. Describe nerve supply of vocal cords.</p> <p>30. Describe lymphatic drainage of vocal cords.</p> <p>31. Enumerate clinical problems (e.g., tumors of vocal cords, damage to external laryngeal nerve, damage to recurrent laryngeal nerve etc.)</p>
Cervical Fascia	1hr	<p>32. Describe skin, superficial fascia and deep cervical fascia.</p> <p>33. Discuss attachments of deep cervical fascia and pharyngeal spaces.</p>
Common Carotid Artery and its branches	2hrs	<p>34. Describe parts of common carotid artery i.e., carotid sinus, carotid body.</p> <p>35. Describe course and relation of ECA.</p> <p>36. Explain branches of ECA.</p> <p>37. Describe parts of ICA with reference to relations.</p>
Subclavian, Internal Jugular, Brachiocephalic Vein	2hrs	<p>38. Describe course of subclavian vein.</p> <p>39. Describe course and relations of IJV.</p> <p>40. Describe different parts of Brachiocephalic vein.</p>



	Lymphatic Drainage of Head and Neck	1hr	41. Explain role of superficial and deep group of lymph nodes in drainage of head and neck.
	Cervical Vertebrae	2hrs	42. Identify different parts of cervical vertebrae <ul style="list-style-type: none"> <li>• Atlas(C1)</li> <li>• Axis(C2)</li> <li>• C3</li> <li>• C7</li> </ul> 43. Describe attachments of Cervical vertebrae. 44. Enumerate clinical problems of cervical vertebrae (e.g., cervical spondylosis, fracture of cervical vertebrae etc.)
	Cervical Plexus	1hr	45. Enlist branches of cervical plexus.
	Brachial Plexus	1hr	46. Describe the formation of brachial plexus. 47. Enlist the branches of brachial plexus.
<b>Theme 2: Neck Swelling</b>			
Gross Anatomy	Thyroid	1hr	48. Describe location and extent of thyroid gland. 49. Briefly explain capsules of thyroid. 50. Explain parts and relations of thyroid gland. 51. Describe blood supply of thyroid gland. 52. Describe nerve supply of thyroid gland. 53. Describe lymphatics of thyroid gland.
Neuroanatomy	Vagus Nerve and Ansa Cervicalis	1hr	54. Explain the origin, course, branches, and the divisions of the vagus nerve. 55. Describe Ansa cervicalis.
	Cervical Part of Sympathetic Trunk:	1hr	56. Describe features and relations of Cervical part of sympathetic trunk.

			57. Discuss features, location, and branches of: a. Superior cervical ganglion b. Middle cervical ganglion c. Inferior cervical ganglion 58. Discuss Horner's syndrome.
Physiology	Thyroid Metabolism	2hrs	59. Discuss the Synthesis and Secretion of the Thyroid Metabolic Hormones 60. Describe the process of production, secretion, and functions of thyroid hormones.
Biochemistry	Thyroid Hormone	1hr	61. Discuss the role of Iodine, Zinc and Selenium in the synthesis and regulation of thyroid hormone.
General Medicine	Thyroid, and Parathyroid	1hr	62. Discuss the clinical aspects of common diseases associated with thyroid and parathyroid.
Oral and maxillofacial surgery	Cervical Lymphadenopathy	1hr	63. Describe the features of acute & chronic cervical lymphadenopathy.
	Facial space infections	1hr	64. Explain clinical features of facial space infections.
<b>Lab Work</b>			
Anatomy	Anterior and posterior triangles of neck	2hrs	65. Demonstrate surface landmarks on a person of anterior and posterior triangles of the neck.
	Pharynx	2hrs	66. Demonstrate surface anatomy of pharynx on model.
	Larynx	2hrs	67. Demonstrate the gross features of larynx.
	Thyroid Gland	2hrs	68. Identify histological features of thyroid gland.
	Cervical vertebrae	2hrs	69. Demonstrate surface landmarks related to cervical vertebrae.

### Theme 3: Earache & Imbalance

Gross Anatomy	External Ear	1hr	70. Discuss parts of external ear.
	External Acoustic Meatus.		71. Describe features of external acoustic meatus.
	Tympanic Membrane		72. Describe structure of tympanic membrane.
	Middle Ear	1hr	73. Describe features of middle ear. 74. Explain boundaries of middle ear. 75. Briefly explain functions of middle ear. 76. Briefly explain mastoid air cells.
	Internal Ear		1hr
Neuroanatomy	Vestibulocochlear Nerve	1hr	78. Explain the origin, course, branches of the divisions of the vestibulocochlear nerve and enumerate its functions.
Physiology	Auditory and Vestibular System	3hrs	79. Explain conduction of sound from the tympanic membrane to the cochlea. 80. Describe functional anatomy of the cochlea. 81. Describe basilar membrane and resonance in the cochlea. 82. Describe function of the organ of Corti. 83. Describe the vestibular system.
<b>Lab Work</b>			
Anatomy	Ear	2hrs	84. Demonstrate various structures of ear on model.
Physiology	Auditory and Vestibular System	2hrs	85. Examine a standardized patient for hearing loss with tuning fork (Weber and Rinne's test). 86. Examine a standardized patient for functions of inner ear.

### Theme 4: Difficulty in Chewing

Anatomy	Muscles Of Mastication	2hrs	87. Explain origin, insertion, nerve supply, blood supply and actions of muscles of mastication.
	Otic Ganglion	1hr	88. Describe location and connections of otic ganglion. 89. Briefly explain branches of otic ganglion.
Physiology	Regulation of food intake	2hrs	90. Enlist the names of Neural centers that regulates food intake. 91. Discuss the neural centers that Influence the mechanical process of feeding. 92. Explain the factors that regulate the quantity of food intake.
	Mastication	1hr	93. Define process of mastication. 94. Explain mechanism of mastication and identify structures involved in it.
Oral Biology & Tooth Morphology	Deciduous teeth	1hr	95. Describe differences between deciduous and permanent teeth.
	Eruption	1hr	96. Describe various eruption movements. 97. Discuss the theories of eruption. 98. Describe mechanism of tooth movement. 99. Describe histology of tooth movement.
	Shedding	1hr	100. Describe the process of shedding of deciduous teeth. 101. Enumerate the differences in the shedding pattern between the anterior and posterior teeth. 102. Describe role of odontoclast in shedding of deciduous teeth. 103. Explain the occurrence of retained deciduous root, deciduous teeth, and sub merged teeth.

	Mandibular 1st & 2nd Pre-Molars	2hrs	<p>104. Discuss initiation of calcification, age of crown completion, age of eruption, and root completion.</p> <p>105. Discuss arch position and general outlines.</p> <p>106. Describe various aspects (labial, lingual, mesial, distal, and occlusal aspect) of crowns of mandibular pre-molars.</p> <p>107. Describe number, location and significance of pulp horns, chamber, and canals.</p> <p>108. Describe number, shape, and inclination of roots.</p>
	Maxillary and Mandibular Molars	6hrs	<p>109. Indicate initiation of calcification, crown completion age, age of eruption and root completion age, arch position, general outline.</p> <p>110. Describe various aspects (buccal, lingual, mesial, distal, and occlusal) of crowns of maxillary and mandibular molars.</p> <p>111. Describe number, shape, and inclination of roots.</p> <p>112. Describe number, location and significance of pulp horns, chamber, and canals.</p> <p>113. Differentiate between mandibular 1st and second molar.</p> <p>114. Differentiate between mandibular and maxillary molars</p>
	Temporomandibular Joint	4hrs	<p>115. Enlist main types of joints (fibrous, cartilaginous, and synovial).</p> <p>116. Describe TMJ Articulation and how does it differ from other synovial joints.</p> <p>117. Discuss the embryology, gross anatomy, and functions of TMJ.</p> <p>118. Describe histological features of articular disc, structure of synovial membrane, composition of synovial fluid.</p> <p>119. Identify the parts of TMJ in slides/image such as glenoid fossa, articular disc, superior &amp; inferior compartments, and condyle on skull and on a patient.</p> <p>120. Discuss the blood supply, nerve supply, age related changes in TMJ.</p>

			121. Correlate clinical aspects of TMJ, integrate the knowledge of anatomy & 122. histology of TMJ into clinical practice and summarize TMJ disorders.
	Occlusion	2hrs	123. Define normal occlusion. 124. Describe the functions of teeth in mastication. 125. Describe malocclusion.
<b>Lab Work</b>			
Anatomy	Muscles of mastication	2hrs	126. Demonstrate palpation of muscles of mastication.
Oral Biology & Tooth Morphology	Mandibular Pre-Molars	2hrs	127. Identify on tooth models/specimens or images crown outline, buccal, lingual, mesial, distal surfaces, occlusal table, and its components. 128. Draw and label different aspects of mandibular pre-molars (buccal, lingual, mesial, distal, and occlusal aspect).
	Maxillary and Mandibular Molars	6hrs	129. Identify on tooth models/specimens or images crown outline, buccal, lingual, mesial, distal surfaces, occlusal table, and its components. 130. Draw and label different aspects of maxillary and mandibular molars (buccal, lingual, mesial, distal, and occlusal aspect).

<b>Theme 5: Cervical Spondylosis</b>			
Histology	Spinal cord	1hr	131. Describe histological features of spinal cord. 132. Discuss transverse section of spinal cord at different levels.
Neuroanatomy	Vertebral Canal	1hr	133. Describe contents of vertebral canal.
	Accessory Nerve	1hr	134. Explain the origin, course, branches of the divisions of the accessory nerve.
	Spinal Cord	1hr	135. Explain the gross anatomy of the spinal cord. 136. Enumerate clinical problems of spinal cord.
	Ascending and Descending Tracts	2hrs	137. Enumerate the ascending and descending tracts of the spinal cord with functions. 138. Discuss spinothalamic tract. 139. Discuss corticospinal tract.
Physiology	Spinal Cord	4hrs	140. Discuss the classification of sensory receptors. 141. Describe dorsal column medial lemniscal system. 142. Discuss antero-lateral system. 143. Differentiate between slow and fast pain pathways.
<b>Lab Work</b>			
Neuroanatomy	Spinal Cord	2hrs	144. Identify and describe microscopic anatomy of spinal cord. 145. Draw and label the cross sections of spinal cord at different levels.
Physiology	Spinal Cord	2hrs	146. Examine a standardized patient for cranial nerve XI examination.

Learning Resources		
S#	Subjects	Resources
1.	Anatomy	<p><b>A. GROSS ANATOMY</b></p> <ol style="list-style-type: none"> <li>1. BD Churasia</li> <li>2. Last's Anatomy</li> </ol> <p><b>B. EMBRYOLOGY</b></p> <ol style="list-style-type: none"> <li>1. Langman's Medical Embryology</li> </ol> <p><b>C. HISTOLOGY</b></p> <ol style="list-style-type: none"> <li>1. Medical Histology By Laiq Hussain</li> </ol> <p style="text-align: center;"><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Netter Atlas of Human Anatomy</li> <li>2. Gray's Anatomy</li> </ol>
2.	Biochemistry	<p style="text-align: center;"><b>Text Books</b></p> <ol style="list-style-type: none"> <li>1. Lippincott illustrated reviews 8<sup>th</sup></li> <li>2. Harper's illustrated Biochemistry 32<sup>th</sup></li> <li>3. U. Satyanarayan and U. Chakarpani 4<sup>th</sup></li> </ol> <p style="text-align: center;"><b>Reference Books</b></p> <ol style="list-style-type: none"> <li>1. Lippincott illustrated reviews</li> <li>2. MLA. Harvey, Richard A., PhD. Lippincott's illustrated reviews: Biochemistry</li> <li>3. U. Satyanarayana Biochemistry</li> <li>4. U. satyanarayan and U. Chakarpani 4th edition</li> <li>5. Harper's illustrated Biochemistry</li> <li>6. Rodwell VW, Bender DA ,Botham KM., Kennelly PJ, Weil P. Eds. Victor W.Rodwell et al.</li> <li>7. Fundamentals of Biochemistry</li> <li>8. Donald V., Judith G. Voet, Charlotte W. John wiley and sons, New york</li> <li>9. Netter's essential Biochemisty</li> <li>10. Lippincott illustrated reviews</li> <li>11. MLA. Harvey, Richard A., PhD. Lippincott's illustrated reviews: Biochemistry</li> </ol>



3.	Physiology	<p style="text-align: center;"><b>Textbooks</b></p> <ol style="list-style-type: none"> <li>1. Guyton and Hall Textbook of Medical Physiology, 13th Edition by John E. Hall.</li> <li>2. Human Physiology: From Cells to Systems, 8th Edition by Lauralee Sherwood</li> <li>3. Ganong's Review of Medical Physiology, 24th Edition (LANGE Basic Science) by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen Brooks.</li> </ol> <p style="text-align: center;"><b>REFERENCE BOOKS</b></p> <ol style="list-style-type: none"> <li>1. Manual of Experimental Physiology 4 th Edition Prof. Dr. Zafar Ali Choudry</li> <li>2. Practical Physiology 1 st Edition Prof. Dr. Shafiq Ahmed Iqbal</li> <li>3. Basis of Clinical Physiology Volume 1 Prof. Dr. Muhammad Akram</li> <li>4. Basis of Clinical Physiology Volume 2 Prof. Dr. Muhammad Akram</li> </ol> <p style="text-align: right;">System wise SEQs and MCQs with key Reference: Physiology by Guyton 1 stEdition Prof. Dr. Samina Malik</p>
4.	Oral Biology	<p style="text-align: center;"><b>Textbook</b></p> <ol style="list-style-type: none"> <li>1. Ten Cate's Oral Histology</li> <li>2. Orban's Oral Histology and Embryology</li> <li>3. Concise Dental Anatomy and Morphology by James L. Fuller</li> </ol> <p style="text-align: center;"><b>Reference Books</b></p> <p style="text-align: center;">Oral Anatomy, Histology and Embryology by B.K.B Berkovitz</p>





