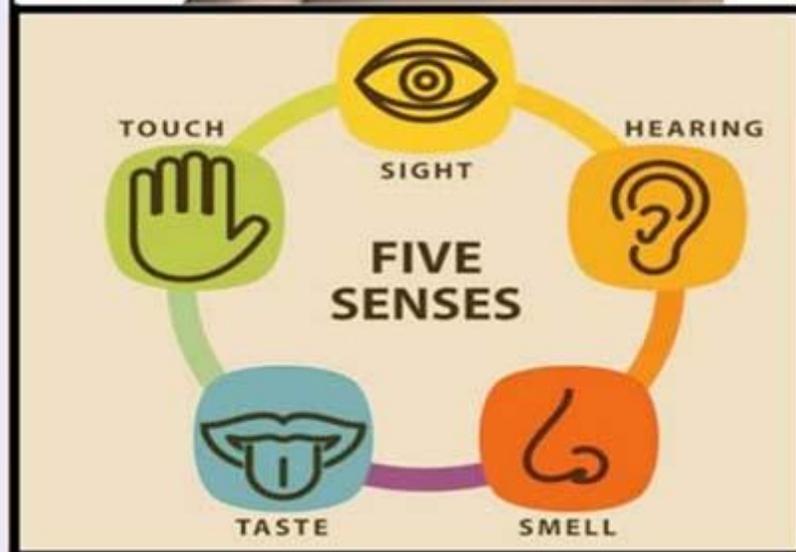
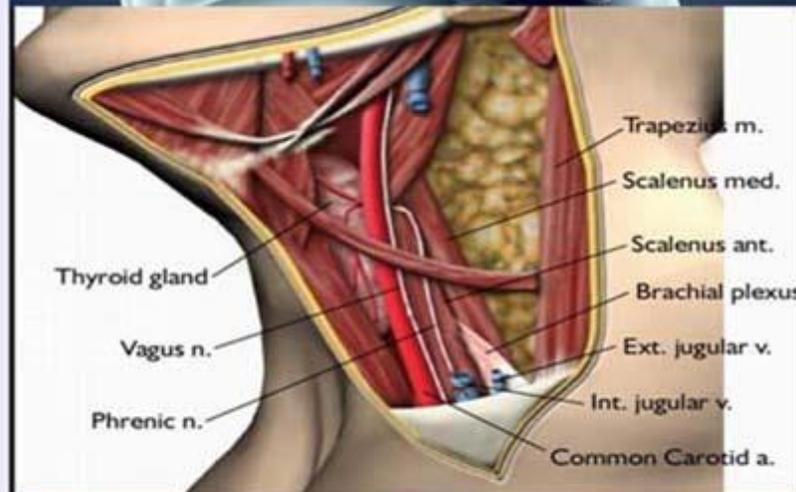


# STUDY GUIDE- SECOND YEAR MBBS

25th March - 17th May 2024

Duration: 7 Weeks

## HEAD & NECK & SPECIAL SENSES MODULE



**STUDY GUIDE FOR HEAD & NECK & SPECIAL SENSES-1 MODULE**

| <b>S.No</b> | <b>CONTENTS</b>                        | <b>Page No</b> |
|-------------|--|----------------|
| 1           | Overview                               | 03             |
| 2           | Introduction to Study Guide            | 04             |
| 3           | Learning Methodologies                 | 05             |
| 4           | Module3: Head & Neck & Special Senses  |                |
| 4.1         | Introduction                           | 07             |
| 4.2         | Objectives and Learning Strategies     | 08             |
| 5           | Learning Resources                     | 20             |
| 6           | Assessment Methods                     | 21             |
| 7           | LNMC Examination Rules And Regulations | 22             |
| 8           | Schedule                               | 23             |

Module name: Head & Neck & Special Senses Year: Two

Duration: 7 weeks (25<sup>th</sup> March to 17<sup>th</sup> May 2024)

Time table hours: Lectures, Case-Based Learning (CBL), Flipped Classroom, Self-Directed Learning, Practical, Skills, Demonstrations

### MODULE INTEGRATED COMMITTEE

|                            |  |
|----------------------------|--|
| <b>MODULE COORDINATOR:</b> | <ul style="list-style-type: none"> <li>Prof. Saima Athar (<b>Anatomy</b>)</li> </ul>   |
| <b>CO-COORDINATORS:</b>    | <ul style="list-style-type: none"> <li>Dr. Amina Raza (<b>Biochemistry</b>)</li> </ul> |

### DEPARTMENTS & RESOURCE PERSONS FACILITATING LEARNING

| BASIC HEALTH SCIENCES  | CLINICAL AND ANCILLARY DEPARTMENTS          |
|--|---|
| <b>ANATOMY</b><br>Professor Zia-ul-Islam   | <b>FAMILY MEDICINE</b><br>Dr. Rabeeya Saeed |
| <b>BIOCHEMISTRY</b><br>Prof. Dr. Faiza Waseem  | <b>NEUROLOGY</b><br>Dr. Syed Ahmed Asif     |
| <b>COMMUNITY MEDICINE</b><br>Dr. Saima Zainab  |   |
| <b>PHYSIOLOGY</b><br>Professor Syed Hafeezul Hassan  |   |
| <b>DEPARTMENT OF HEALTH PROFESSIONS EDUCATION</b>  |   |
| <ul style="list-style-type: none"> <li>Professor Nighat Huda</li> <li>Professor Sobia Ali</li> <li>Dr. Afifa Tabassum</li> <li>Dr. M. Ahsan Naseer</li> <li>Dr. Yusra Nasir</li> </ul> |   |
| <b>LNH &amp; MC MANAGEMENT</b>   |   |
| <ul style="list-style-type: none"> <li>Professor KU Makki, Principal LNH&amp;MC</li> <li>Dr. Shaheena Akbani, Director A.A &amp; R.TLNH&amp;MC</li> </ul>                              |   |
| <b>STUDY GUIDE COMPILED BY: Department of Health Professions Education</b>   |   |

## **INTRODUCTION**

### **WHAT IS A STUDY GUIDE?**

It is an aid to:

- Inform students how the student learning program of the module has been organized
- Help students organize and manage their studies throughout the module
- Guide students on assessment methods, rules, and regulations

### **THE STUDY GUIDE:**

- Communicates information on the organization and management of the module.  
This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of the module.
- Identifies the learning strategies such as lectures, small group teachings, clinical skills, demonstration, tutorial and case based learning that will be implemented to achieve the module objectives.
- Provides a list of learning resources such as books, computer-assisted learning programs, web-links, and journals, for students to consult to maximize their learning.
- Highlights information on the contribution of continuous and semester examinations on the student's overall performance.
- Includes information on the assessment methods that will be held to determine every student's Achievement of objectives.
- Focuses on information about examination policy, rules, and regulations.

### **CURRICULUM FRAME WORK:**

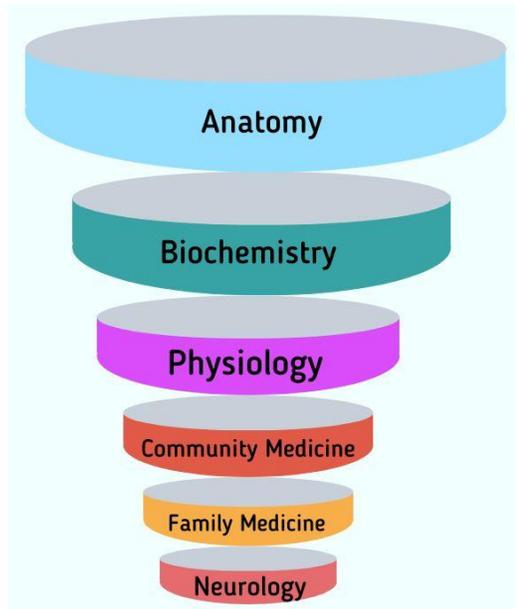
Students will experience an integrated curriculum similar to previous modules.

### **INTEGRATED CURRICULUM:**

Comprises system-based modules such as Head and Neck & Special senses, Neurosciences and Endocrinology which links basic science knowledge to clinical problems. Integrated teaching means that subjects are presented as a meaningful whole. Students will be able to have a better understanding of basic sciences when they repeatedly learn about clinical examples.

Case-based discussions, computer-based assignments, early exposure to clinics, wards, and skills acquisition in the skills lab and physiotherapy department are characteristics of the integrated teaching program.

## INTEGRATING DISCIPLINES OF HEAD AND NECK & SPECIAL SENSES MODULE



### **LEARNING METHODOLOGIES:**

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

- Interactive Lectures
- Small Group Discussion
- Case-Based Learning
- Practicals
- Skills session
- Flipped Classroom
- Self-Directed Learning

### **INTERACTIVE LECTURES:**

In large groups, the lecturer introduces a topic or common clinical conditions and explains the underlying phenomena through questions, pictures, videos of patients' interviews, exercises, etc. Students are actively involved in the learning process.

### **SMALL GROUP DISCUSSION (SGD):**

This format helps students to clarify concepts and acquire skills or attitudes. Sessions are structured with the help of specific exercises such as patient cases, interviews, or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials, and self-directed learning. The facilitator's role is to ask probing questions, summarize, or rephrase to help clarify concepts.

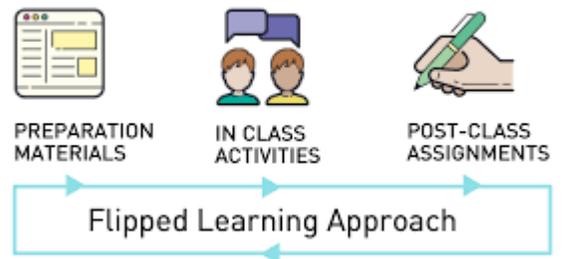
**CASE-BASED LEARNING:** A small group discussion format where learning is focused on a series of questions based on a clinical scenario. Students discuss and answer the questions by applying relevant knowledge gained in clinical and basic health sciences during the module.

**PRACTICAL:** Basic science practicals related to anatomy, biochemistry, pathology, pharmacology, and physiology are scheduled for student learning.

**SKILLS SESSION:** Skills relevant to respective modules are observed and practiced where applicable in the skills laboratory or Department of Physiotherapy.

**FLIPPED CLASSROOM:** A flipped classroom is a **type of blended learning** where students are introduced

to content at home and practice working through it at classroom. This is the reverse of the more common the practice of introducing new content to classrooms, then assigning homework and projects to be completed by the students independently at home.



The concept behind the flipped classroom is to rethink when students have access to the resources they need most. If the problem is that students need help doing the work rather than being introduced to the new thinking behind the work, then the solution the flipped classroom takes is to reverse that pattern.

**SELF-DIRECTED LEARNING:** Students assume responsibilities for their learning through individual study, sharing and discussing with peers, and seeking information from Learning Resource Center, teachers, and resource persons within and outside the college. Students can utilize the time within the college's scheduled hours of self-study.

**MODULE3: HEAD & NECK & SPECIAL SENSES****INTRODUCTION:**

The head and neck and special senses is an introductory module that provides knowledge about the vital structures present in the head and neck region, their functions, and clinical correlations. These include the head and skull, organs for special senses (eyes, ears, nose, and tongue), cranial nerves, great vessels, and the thyroid gland. This module will give the students basic knowledge about the structures present in the head and neck region along with their important functions and abnormalities which can lead to various diseases.



**COURSE OBJECTIVES AND STRATEGIES**

At the end of the module the students will be able to:

**ANATOMY**

| TOPICS & OBJECTIVES   | LEARNING STRATEGIES |  |                     |
|---|---------------------|--|---------------------|
| <b>1. Bones of the skull</b>  | Tutorial / SGD      |  |                     |
| <ul style="list-style-type: none"> <li>List the parts of the skeleton (axial and appendicular)</li> <li>Describe different bones and sutures of the skull</li> </ul>  |                     |  |                     |
| <b>2. Norma Frontalis, vertical, fontanelles with their clinical correlation</b>  |                     |  |                     |
| <ul style="list-style-type: none"> <li>Identify the views / norms of the skull.</li> <li>List the bones contributing to norma Frontalis &amp; Verticals</li> <li>Describe features related to bones of both normas</li> <li>Relate the contents with the respective foramina</li> <li>Identify the sutures and fontanelles on Norma verticalis</li> <li>Discuss the clinical importance of fontanelles</li> </ul> |                     |  |                     |
| <b>3. Pharyngeal apparatus &amp; its anomalies</b>  |                     | Interactive Lecture/ Case-Based Discussion |                     |
| <ul style="list-style-type: none"> <li>Define pharyngeal arches, pouches, clefts, and membranes</li> <li>Describe the derivatives of each arch (Muscle, bones, cartilage)</li> <li>Describe the fate of pouches, clefts, and membranes</li> <li>Describe the common anomalies of the pharyngeal apparatus</li> </ul>  |                     |  |                     |
| <b>4. Scalp &amp; its layers</b>  |                     |  | Interactive Lecture |
| <ul style="list-style-type: none"> <li>Describe the extent/boundaries and five layers of the scalp</li> <li>Describe the nerves and vessels of the scalp and their clinical correlates</li> </ul>   |                     |  |                     |
| <b>5. Norma Lateralis &amp; occipitalis</b>   | Practical           |  |                     |
| <ul style="list-style-type: none"> <li>Identify the bones contributing to Norma Lateralis and Occipitalis</li> <li>Recognize different bony landmarks of norma lateralis &amp; occipitalis</li> <li>Identify the sutures</li> <li>Relate the foramina with their respective contents</li> </ul>   |                     |  |                     |
| <b>6. Development of face &amp; its anomalies</b>   |                     | Interactive Lecture                        |                     |
| <ul style="list-style-type: none"> <li>Describe the formation of facial prominences</li> <li>Discuss the formation of different parts of the face from the prominences</li> <li>Define nasal placode and nasal pit &amp; nasolacrimal groove</li> <li>Discuss the most common anomalies of a face (cleft lip )</li> </ul>   |                     |  |                     |
| <b>7. Face (Muscles, Nerves: Extra Cranial Part of V &amp; VII)</b>   |                     |  |                     |
| <ul style="list-style-type: none"> <li>Describe the boundaries of the face</li> <li>Enumerate the muscles and innervation of the face</li> <li>Discuss the action of the muscles of the face</li> <li>Discuss the course and distribution of CN-V and extracranial part of CN- VII</li> <li>Describe the applied anatomy of a face (Bell's palsy)</li> </ul>  |                     |  |                     |

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| <b>8. Norma Basalis (anterior and middle part)</b>  | Practical  |
| • List the bones forming the base of the skull  |  |
| • Describe an anterior and middle part of the base of the skull   |  |
| • Identify different foramina present at the base of the skull  |  |
| <b>9. Arteries, veins &amp; lymphatic of the face</b>   | Interactive Lecture                              |
| • Describe the arterial supply of the face, the major veins of the face, and the formation and fate of the retromandibular vein |  |
| • Explain the lymphatic drainage of the face  |  |
| <b>10. Norma Occipitalis &amp; posterior part of Basalis (Demonstration)</b>  | Interactive Lecture                              |
| • Describe the location, relations, and connections of ciliary ganglion   |  |
| • Define the disorders associated with ciliary ganglion   |  |
| <b>11. Orbital cavity and its contents</b>  | Interactive Lecture                              |
| • Describe the boundaries & content of orbital cavity   |  |
| • Enumerate the relations of the orbital cavity   |  |
| • Define the diseases of lacrimal apparatus   |  |
| <b>12. Eyelid &amp; Lacrimal Apparatus</b>  | Interactive Lecture                              |
| • Describe the eyelid and its parts   |  |
| • Explain the innervation and blood supply of eyelids   |  |
| • Describe parts of the lacrimal apparatus  |  |
| <b>13. Eyeball and Muscles</b>  | Interactive Lecture/Hands-on small group session |
| • Describe the development of the eye from neural and non-neural components   |  |
| • Tabulate the structures which develop from the optic cup, neural crest cells, and surface ectoderm                            |  |
| • Explain the development of the iris, ciliary bodies, lens, cornea, eyelid, and lacrimal gland                                 |  |
| • Discuss the common congenital anomalies of the eye  |  |
| • Dissect layers of the eyeball.  |  |
| • Explain the anatomical organization of tunics of the eyeball  |  |
| <b>14. Development of eye</b>   |  |
| • Explain the functional component and nuclei of these nerves   |  |
| <b>15. Cranial Nerves I - VI &amp; their clinical correlation</b>   | Interactive Lecture                              |
| • Describe the intra and extra-cranial pathway  |  |
| • Describe the innervation by these nerves  |  |
| • Explain the cranial nerve lesions with their presentation   |  |
| • Discuss cranial nerve testing   |  |

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| <b>16. Gross anatomy of the mandible and hyoid bone</b>  | Interactive Lecture                       |
| • Describe parts of the mandible   |   |
| • List attachments on each part of the mandible  |   |
| • Describe the foramen on the mandible and the structures passing through these foramina                                     |   |
| • Enumerate the joints formed by mandible  |   |
| • Describe the ossification of the mandible  |   |
| • Discuss the applied anatomy of the mandible  |   |
| • Describe the location and vertebral level of the hyoid bone  |   |
| • Describe the parts of the hyoid bone   | Interactive Lecture/Case-Based Discussion |
| • Explain the attachments on the hyoid bone  |   |
| <b>17. Temporal Fossa &amp; Temporomandibular Joint</b>  |   |
| • Describe the boundaries of the temporal fossa  |   |
| • List the contents of the temporal fossa  |   |
| • Describe the temporalis muscle, its innervation, and action  |   |
| • Describe the Temporomandibular joint, its type, and its articular surfaces   |   |
| • Describe the ligaments attached and movements performed at the Temporomandibular joint                                     | Interactive Lecture                       |
| <b>18. Infratemporal Fossa &amp; Pterygopalatine Fossa</b>   |   |
| • Describe the boundaries of the Infratemporal fossa   |   |
| • List the contents of the Infratemporal fossa   |   |
| • List the communications of Infratemporal fossa   |   |
| • Describe the contents and boundaries of Pterygopalatine fossa  |   |
| • Discuss Pterygopalatine ganglion and its connections   | Case-Based Discussion                     |
| • List the communications of Pterygopalatine fossa   |   |
| <b>19. Cranial Nerves VII to XII &amp; their clinical correlation</b>  |   |
| • List the functional components of these nerves   |   |
| • Describe their intra and extra-cranial course  |   |
| • Discuss their innervations   |   |
| • Discuss the common lesions and their clinical presentation   | Interactive Lecture/Practical             |
| • Demonstrate the clinical testing of these nerves   |   |
| <b>20. Gross anatomy &amp; histology of the oral cavity</b>  |   |
| • Discuss the boundaries and divisions of the oral cavity  |   |
| • Describe the vestibule and oral cavity proper with their contents  |   |
| • Discuss the oropharyngeal isthmus  |   |
| • Describe the general features, classification, and organization of oral mucosa   |   |
| • Discuss the type and components of oral epithelium   | Interactive Lecture                       |
| • Discuss the histology of lips, cheek, gums, and palate   |   |
| <b>21. Gross anatomy of the tongue</b>   |   |
| • Identify the gross anatomical features of the tongue   |   |
| • Describe the intrinsic muscles and extrinsic musculature of the tongue and their movements                                 | Interactive Lecture                       |
| • Discuss the blood supply, innervation, and lymphatic drainage of the tongue and the clinical conditions associated with it |   |

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| <b>22. Hard and Soft Palate</b>  |  |
| • Discuss the boundaries, muscle attachments, and mucosal coverings of the hard and soft palate      |  |
| • Discuss the function of the hard and soft palate during the process of mastication and deglutition |  |
| • Discuss the blood supply and nerve supply of hard and soft palate                                  |  |
| • Discuss gag reflex and its complications after stroke  |  |
| <b>23. Parotid Gland and Parotid Region</b>  |  |
| • Describe the boundaries and contents of the parotid region   |  |
| • Describe the borders, surfaces, and relations of the parotid gland                                 |  |
| • List the structures passing through it   |  |
| • Describe the facial nerve and its branches in the mass of the parotid gland                        |  |
| • Describe the origin, course, and size of the parotid duct.   |  |
| • Discuss the clinical conditions (stone formation and parotitis) related to gland and duct          |  |
| <b>24. Development of Tongue &amp; salivary glands</b>   |  |
| • Describe the development of the tongue   |  |
| • Discuss the congenital anomalies associated with the development of tongue                         |  |
| • Explain the beginning of the development of the 3 salivary glands                                  |  |
| • Discuss the embryonic development of the secretory part, duct system, and stroma                   |  |
| <b>25. Development of palate</b>   |  |
| • Describe palatal development during the seventh to ninth weeks of gestation                        |  |
| • Explain the embryonic basis of cleft palate  |  |
| • Discuss the types of cleft lip and palate  |  |
| <b>26. Gross Anatomy of the external nose, boundaries, blood &amp; nerve supply</b>                  |  |
| • Describe the features of the external nose   | Interactive<br>Lecture/ Small<br>Group<br>Discussion               |
| • Describe the boundaries of the nasal cavity  |  |
| • Describe the blood & nerve supply of nose  |  |
| • Discuss the formation of anastomoses at little's area and its clinical importance                  |  |
| <b>27. Histology of Nasal Cavity, respiratory &amp; olfactory epithelia</b>                          |  |
| • Enumerate the epithelia of the nasal cavity  | Interactive<br>Lecture/ Small<br>Group<br>Discussion/<br>Practical |
| • Discuss the features of olfactory and respiratory mucosa   |  |
| • Describe the cells of olfactory and respiratory epithelium   |  |
| <b>28. Gross anatomy of Para nasal air sinuses</b>   |  |
| • List the para nasal air sinuses  |  |
| • Describe their location, important relations, drainage, and nerve supply                           |  |
| • Discuss the clinical significance of para-nasal air sinuses  |  |
| <b>29. Development of nose &amp; para nasal sinuses</b>  |  |
| • Describe the development of different parts of the nose and para-nasal sinuses                     |  |
| • Describe congenital anomalies associated with their development                                    |  |
| <b>30. Gross &amp; Histology: External and Middle Ear</b>  |  |
| • Discuss the division of the ear into the external, middle, and internal ear                        | Interactive<br>Lecture/<br>Practical                               |
| • Describe the parts of the external ear and the boundaries & content of the middle ear cavity       |  |
| • Explain the histological features of parts of the external and middle ear                          |  |
| • Discuss the functions of the external and middle ear as an organ for hearing                       |  |
| • List the vascular supply and innervation of the external and middle ear.                           |  |
| • Define the clinical conditions associated with external and middle ear                             |  |

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| <b>31. Neck, Deep Cervical Fascia, carotid sheath, and Platysma Muscle</b>   | Tutorial                                    |
| <ul style="list-style-type: none"> <li>Define the layers of neck; skin superficial fascia and deep fascia</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Describe the cutaneous supply of skin of the neck</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>List the different modifications of deep fascia</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Describe prevertebral and pre-tracheal, investing layers of deep fascia</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Describe the carotid sheath</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>List the contents of the carotid sheath at different levels &amp; its important relations</li> <li>Describe the platysma muscle, its innervation, and action</li> </ul>   |   |
| <b>32. Anterior Triangle of Neck</b>   | Interactive Lecture                         |
| <ul style="list-style-type: none"> <li>Discuss the division of triangles of the neck</li> <li>List the subdivisions of the anterior triangle</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Describe the boundaries and contents of sub-divisions of the anterior triangle i.e. Sub mental, Sub-mandibular, Muscular &amp; Carotid</li> </ul>   |   |
| <b>33. Submandibular region &amp; Submandibular gland</b>  | Interactive Lecture                         |
| <ul style="list-style-type: none"> <li>Describe the boundaries of the Sub-mandibular triangle</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>List the contents of the Sub-mandibular triangle</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Describe the anatomy of the Sub-mandibular salivary gland</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Describe the emergence and course of Wharton's duct and its relation with the lingual nerve.</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Describe the location &amp; connections of Sub-mandibular ganglion</li> <li>Describe the location and area of drainage of Sub-mandibular lymph nodes</li> </ul>   |   |
| <b>34. Posterior triangle of the neck, Cervical Plexus &amp; Cranial Nerve XI</b>  | CBD   |
| <ul style="list-style-type: none"> <li>Discuss briefly the division of the neck into anterior and posterior triangles</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Describe the boundaries of the posterior triangle of the neck</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>List the contents of the posterior triangle of the neck</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Discuss the formation, branches, and functions of the cervical plexus</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Discuss the origin, course, branches, and functions of cranial nerve XI</li> <li>Discuss the clinical conditions associated with a posterior triangle of the neck, cervical plexus, and cranial nerve XI</li> </ul> |   |
| <b>35. Pharynx &amp; Tonsils</b>   | Interactive Lecture/ Small Group Discussion |
| <ul style="list-style-type: none"> <li>Discuss the morphology, location, and extent of the pharynx</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Explain the division of the pharynx into Nasopharynx, Oropharynx &amp; Laryngopharynx</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Describe the pharyngeal and palatine tonsils</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Discuss the origin, insertion, and actions of pharyngeal muscles</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Discuss the significance of Pharyngeal and Oropharyngeal isthmus.</li> <li>Discuss the innervation and blood supply of the pharynx along with the associated clinical conditions</li> </ul>                         |   |
| <b>36. Gross anatomy of thyroid &amp; parathyroid gland</b>  | Interactive Lecture/ Small Group Discussion |
| <ul style="list-style-type: none"> <li>Explain the gross anatomy of the thyroid &amp; parathyroid gland</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Discuss the blood supply and nerve supply of the thyroid and parathyroid gland</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Relate the clinical anatomy of the thyroid and parathyroid gland with the relevant conditions</li> </ul>  |   |
| <b>37. Gross &amp; histology of larynx</b>   | Interactive Lecture/ Small Group Discussion |
| <ul style="list-style-type: none"> <li>Explain the gross anatomy of the larynx</li> </ul>  |   |
| <ul style="list-style-type: none"> <li>Discuss the blood supply, nerve supply, and clinical anatomy of the larynx</li> </ul>   |   |
| <ul style="list-style-type: none"> <li>Describe the histological features of the larynx</li> </ul>   |   |

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| <b>38. Development of Thyroid, Parathyroid, Larynx and Thymus</b>   | Interactive Lecture |
| <ul style="list-style-type: none"> <li>Describe the developmental anatomy of the thyroid, parathyroid, larynx, and thymus</li> <li>Discuss congenital anomalies associated with their development</li> </ul>  |                     |
| <b>39. Blood vessels and Lymphatics drainage of head and neck</b>   |                     |
| <ul style="list-style-type: none"> <li>Describe the major vessels of the head &amp; neck</li> <li>Describe the Superficial and deep cervical lymph nodes</li> <li>Explain their relation with jugular veins</li> <li>Summarize their area of drainage</li> <li>Discuss their clinical significance</li> </ul>                         |                     |
| <b>40. Gross &amp; Histology: Internal Ear</b>  |                     |
| <ul style="list-style-type: none"> <li>Describe the parts of the internal ear</li> <li>Describe the histological features of the parts of the internal ear</li> <li>Discuss the functions of the internal ear as an organ for hearing and balance</li> <li>Discuss the clinical conditions associated with internal ear</li> </ul>    |                     |
| <b>41. Development of Ear</b>   | Interactive Lecture |
| <ul style="list-style-type: none"> <li>Explain the development of external, middle, and internal ear</li> <li>Discuss congenital deafness and other anomalies of the ear</li> </ul>   |                     |
| <b>42. Integrated lecture on the auditory pathway</b>   |                     |
| <ul style="list-style-type: none"> <li>Discuss the components of the auditory pathway</li> <li>Describe the function of different parts of the auditory pathway</li> <li>Describe the clinical conditions associated with the auditory pathway</li> <li>Describe the vestibule and oral cavity proper with their contents.</li> </ul> |                     |
| <b>43. Surface anatomy of head and neck (Facial Artery and Parotid Gland)</b>   | Tutorial            |
| <ul style="list-style-type: none"> <li>Trace the course of the facial artery in the face</li> <li>Palpate the facial artery</li> <li>Identify the landmarks of borders and surfaces of the parotid gland</li> <li>Palpate the Parotid gland</li> <li>Trace the course and opening of the parotid duct</li> </ul>                      |                     |
| <b>44. Histology of Tongue</b>  |                     |
| <ul style="list-style-type: none"> <li>Identify the microscopic slide of the tongue based on histology</li> <li>Describe the different layers of the tongue</li> <li>Describe different types of lingual papillae</li> <li>Describe different glands of the tongue</li> </ul>   |                     |
| <b>45. Histology of salivary gland</b>  | Practical           |
| <ul style="list-style-type: none"> <li>Identify the histological slide of the salivary gland</li> <li>Describe the histological appearance of the salivary gland</li> <li>Describe the different types of acini</li> </ul>  |                     |
| <b>46. Histology of Eye Ball</b>  |                     |
| <ul style="list-style-type: none"> <li>Identify the histological features of the eyeball</li> <li>Describe the histological feature of each coat of the eyeball</li> <li>Describe the histology of the cornea and lens</li> <li>Discuss the arrangement and composition of the layers of the retina</li> </ul>                        |                     |
| <b>47. Histology of Nasal Cavity, respiratory &amp; olfactory epithelia</b>   |                     |
| <ul style="list-style-type: none"> <li>Identify various parts on slides</li> </ul>  |                     |

- Describe the histological characteristics of each part

## **BIOCHEMISTRY**

| TOPICS & OBJECTIVES   | LEARNING STRATEGIES                                  |
|---|--|
| <b>1. Introduction to nutrition</b>   | Interactive<br>Lecture/ Small<br>Group<br>Discussion |
| • Discuss nutrition, nutrients, BMI, RDA and RMR  |  |
| • Discuss the biochemical importance of a Balanced diet                                     |  |
| • Discuss the basic food groups   |  |
| • List the essential nutrients and their importance in the diet                             |  |
| • Discuss the dietary sources and recommendations for micronutrients                        |  |
| • Describe the importance and benefits of water   |  |
| • Discuss the importance of dietary fibers  |  |
| • Discuss the daily caloric requirements  |  |
| • Discuss the Dietary Reference Intakes (EAR, RDA, AI, UL)                                  |  |
| • Discuss the clinical disorders of nutrition   | Interactive<br>Lecture                               |
| <b>2. Nutritional importance of dietary carbohydrates</b>                                   |  |
| • Explain the biochemical importance of dietary carbohydrate                                |  |
| • Discuss a Balanced diet   |  |
| • Classify the types of dietary carbohydrates   |  |
| • Discuss the significance of simple and complex dietary carbohydrates                      |  |
| • Explain the Glycemic index and Glycemic load  |  |
| • Describe the biochemical complications of Obesity   |  |
| • Discuss metabolic syndrome and its complications  |  |
| <b>3. Nutritional importance of dietary proteins</b>  |  |
| • Classify Proteins according to their nutritional importance and give examples             |  |
| • List the biochemical functions of proteins in the body                                    |  |
| • Explain recommended dietary requirements of protein in different age groups               |  |
| • Describe the Amino acid pool & Nitrogen balance   |  |
| • Describe Protein-energy malnutrition (Marasmus & Kwashiorkor)                             |  |
| • List the common causes of protein energy malnutrition                                     |  |
| • Explain the clinical presentation of the patient having PEM.                              | Interactive<br>Lecture                               |
| <b>4. Nutritional importance of dietary lipids</b>  |  |
| • Classify Lipids according to their nutritional importance and give examples               |  |
| • Explain the biochemical functions of dietary lipids                                       |  |
| • Discuss the sources and recommended daily allowance of dietary lipids                     |  |
| • Discuss the biochemical mechanism of the development of atherosclerosis                   |  |
| • Discuss the clinical significance of dietary lipids (Metabolic syndrome, Atherosclerosis) |  |
| • List the common causes of steatorrhea   |  |

|   |                     |
|---|---------------------|
| • Explain the clinical presentation and treatment of a patient with lipid malabsorption       |                     |
| <b>5. Vitamin A</b>   |                     |
| • Explain the chemical structure of Vitamin A   |                     |
| • Classify the different types of Vitamin A   |                     |
| • Explain the biochemical functions of Vitamin A  |                     |
| • Discuss the role of vitamin A in the visual cycle   |                     |
| • List the sources and daily requirements of Vitamin A  |                     |
| • Discuss the clinical significance of Vitamin A deficiency and toxicity                      |                     |
| • Correlate the interpretation of laboratory investigations with relevant clinical conditions |                     |
| <b>6. Overview of Dietary Minerals</b>  |                     |
| • List and classify the dietary minerals with their biochemical importance                    |                     |
| • Describe their sources and daily recommended allowances                                     |                     |
| • Explain their biochemical functions   |                     |
| • Discuss the clinical significance of mineral deficiency and toxicity                        |                     |
| <b>7. Balanced diet</b>   |                     |
| • Discuss the clinical importance of a balanced diet  |                     |
| • Correlate the interpretation of laboratory investigations with relevant clinical conditions |                     |
| <b>8. Deficiencies of minerals</b>  |                     |
| • Discuss the clinical importance of minerals(e.g. Iron, Calcium)                             |                     |
| • Correlate the interpretation of laboratory investigations with relevant clinical conditions |                     |
| <b>9. Obesity</b>   |                     |
| • Discuss the clinical importance of Obesity  |                     |
| • Correlate the interpretation of laboratory investigations with relevant clinical conditions |                     |
| <b>10. Protein Calorie Malnutrition (PCM), Marasmus and Kwashiorkor</b>                       |                     |
| • Discuss the clinical importance of PCM, Marasmus, and Kwashiorkor                           |                     |
| • Interpret clinical conditions correlated with their laboratory investigations.              |                     |
| <b>11. Metabolic syndrome, Atherosclerosis</b>  |                     |
| • Discuss the clinical importance of Metabolic syndrome & Atherosclerosis                     |                     |
| • Correlate the interpretation of laboratory investigations with relevant clinical conditions |                     |
| <b>12. Calculation of Body Mass Index (BMI)</b>   |                     |
| • Explain the significance of the calculation of Body Mass Index                              |                     |
| • Explain the method to calculate BMI   |                     |
| • Calculate the BMI   |                     |
| • Interpret the significance of the calculated BMI  |                     |
| • Correlate the interpretation of laboratory investigations with relevant clinical conditions |                     |
| <b>13. Interpretation of glycemic index</b>   |                     |
| • Define Glycemic Index and Glycemic Load   |                     |
| • Compare the Glycemic index of different carbohydrates                                       |                     |
| • Interpret the significance of GI & GL   |                     |
| • Outline the method for calculation of GI of various food items                              |                     |
| • Correlate the interpretation of laboratory investigations with relevant clinical conditions |                     |
|   | Interactive Lecture |
|   | Interactive Lecture |
|   | Case-Based Learning |
|   | Practical           |

**COMMUNITY MEDICINE**

| TOPICS & OBJECTIVES                                     | LEARNING STRATEGIES |
|---|---------------------|
| <b>Air pollution, Noise pollution &amp; its control</b> | Interactive Lecture |
| Describe the sources of air pollution and its control.  |                     |
| Discuss noise pollution & its control                   |                     |

**FAMILY MEDICINE**

| TOPICS & OBJECTIVES  | LEARNING STRATEGIES                 |
|--|-------------------------------------|
| <b>Clinical presentation of common nasal diseases</b>  | Practical / Small Group Discussions |
| • list the common diseases of the nasal cavity (rhinitis, nasal obstruction, epistaxis)                                  |                                     |
| • Describe the clinical presentation of common diseases of the nasal cavity Discuss the nasal manifestations of covid 19 |                                     |
| • Describe the clinical presentation of common diseases of oral cavity (oral thrush/ulcers, oral cancers)                |                                     |
| • Describe the clinical presentation of common diseases of the throat (Tonsillitis and Pharyngitis).                     |                                     |
| • Discuss the reason for loss of taste in covid 19.  |                                     |

**NEUROLOGY**

| TOPICS & OBJECTIVES                                    | LEARNING STRATEGIES |
|--|---------------------|
| <b>Facial Nerve Palsy</b>                              | Case Based Learning |
| • Explain the signs and symptoms of Facial nerve Palsy |                     |
| • Examine the Facial nerve on a simulated patient      |                     |

**PHYSIOLOGY**

| TOPICS & OBJECTIVES  | LEARNING STRATEGIES   |
|--|---|
| <b>1. Optics of the eye</b>  | Small Group Discussion / Simulation/SDL                             |
| <ul style="list-style-type: none"> <li>• Explain the basic physiology of the eye &amp; its refractive surfaces</li> <li>• Discuss the physical principles of optics</li> <li>• Describe the mechanism of accommodation &amp; its control</li> </ul>  |   |
| <b>2. Formation &amp; circulation of aqueous humor</b>   |   |
| <ul style="list-style-type: none"> <li>• Describe the formation and circulation of aqueous humor</li> <li>• Explain the mechanism of regulation of intraocular pressure</li> <li>• Define glaucoma &amp; its types</li> <li>• Explain the pathophysiology of glaucoma.</li> <li>• List different types of glaucoma</li> <li>• Discuss the treatment plan for glaucoma</li> </ul> | Interactive Lecture/Case-Based Learning                             |
| <b>3. Visual acuity &amp; errors of refraction</b>   | Interactive Lecture/ Small Group Discussion                         |
| <ul style="list-style-type: none"> <li>• Define visual acuity</li> <li>• Describe the errors of refraction (Myopia, hyperopia, astigmatism &amp; their correction by using different lens systems)</li> </ul>  |   |
| <b>4. Photo-transduction</b>   | Interactive Lecture/ Small Group Discussion/ Self Directed Learning |
| <ul style="list-style-type: none"> <li>• Describe the physiology of retinal layers</li> <li>• Explain the photochemistry of vision (rhodopsin - retinal)</li> <li>• Describe the mechanism of activation of Rods</li> </ul>  |   |
| <b>5. Visual pathway &amp; its lesions</b>   |   |
| <ul style="list-style-type: none"> <li>• Explain the neural circuitry of the Retina</li> <li>• Describe the physiology of the visual pathway</li> <li>• Name the optic lesion associated with the visual pathway</li> </ul>  |   |
| <b>6. Eye movements &amp; their control</b>  |   |
| <ul style="list-style-type: none"> <li>• Explain the muscular control of eye movement</li> <li>• Describe the fixation movements of the eye</li> <li>• Define accommodation reflex &amp; pupillary light reflex</li> </ul>   |   |
| <b>7. Sense of hearing, mechanism of hearing</b>   |   |
| <ul style="list-style-type: none"> <li>• Describe the physiology of hearing &amp; function of tympanic membrane &amp; ossicular system</li> <li>• Define impedance matching &amp; attenuation reflex</li> <li>• Explain the conduction of sound waves in the cochlea</li> <li>• Describe the function of the organ of Corti</li> </ul>   | Tutorial  |
| <b>8. Auditory pathway</b>   | Interactive Lecture/  |
| <ul style="list-style-type: none"> <li>• Explain the auditory nervous pathway &amp; abnormalities associated with it</li> <li>• Describe the function of the cerebral cortex in hearing</li> </ul>   |   |

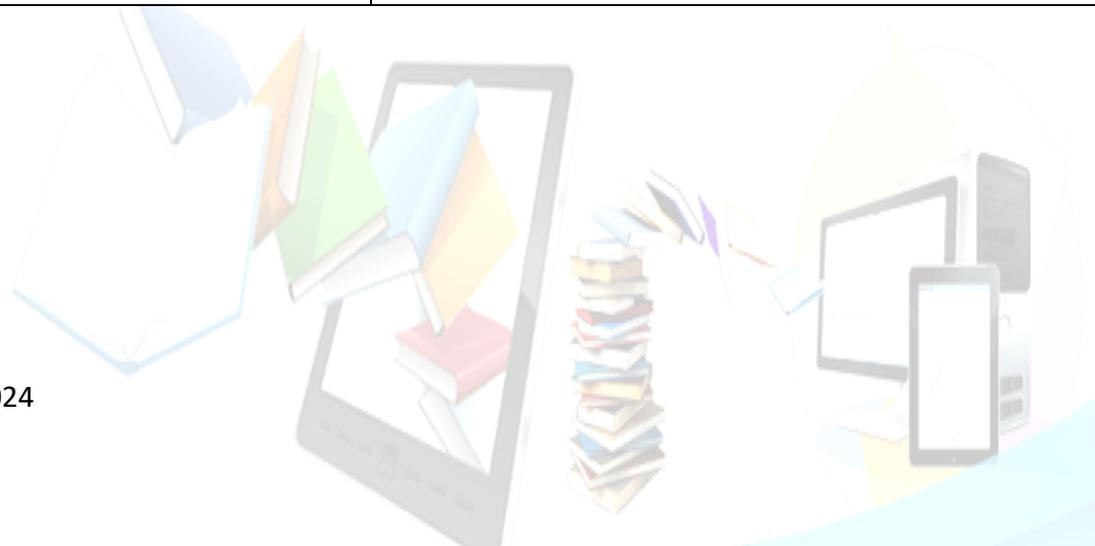
|   |  |
|---|--|
| <b>9. Sense of taste &amp; smell</b>  | Small Group Discussion/<br>Tutorial                    |
| • List the primary sensations of taste  |  |
| • Explain the mechanism of taste perception and its transmission into the central nervous system  |  |
| • List the primary sensations of smell  |  |
| • Describe the stimulation of olfactory cells & its transmission into the central nervous system  |  |
| <b>10. Visual acuity &amp; color vision</b>   | Practical /<br>Small Group Discussion                  |
| • Define visual acuity  |  |
| • Determine the near and far visual acuity  |  |
| • List the refractive errors and their correction   |  |
| • Examine the color vision of a subject using an Ishihara eye chart                               |  |
| • Discuss the errors in color vision  |  |
| <b>11. Perimetry</b>  | Practical /<br>Small Group Discussion                  |
| • Describe various parts of the Perimeter and their uses  |  |
| • Define physiological blind spot   |  |
| • Interpret the perimeter chart of a patient and tell if any abnormality is present               |  |
| • Identify lesions of the visual pathway by performing Perimetry                                  |  |
| <b>12. Hearing test</b>   | Interactive Lecture /Case-Based Learning/<br>Practical |
| • Elaborate bone conduction and air conduction  |  |
| • Describe the principle of various tuning fork tests   |  |
| • Identify conductive and sensor neural deafness based on the interpretation of tuning fork tests |  |
| • List the three common types of deafness   |  |
| • Explain the signs & symptoms, of deafness   |  |
| • Discuss the diagnosis and treatment of deafness   |  |
| <b>13. Smell and taste</b>  | Lecture  |
| • List the basic sensation of smell   |  |
| • Identify the abnormalities associated with the perception of smell                              |  |
| • Map the pathway of the sense of smell   |  |
| • List the basic modalities of taste  |  |
| • Identify the abnormalities associated with a sense of taste                                     |  |
| <b>14. Mechanism of Phonation</b>   | Interactive Lecture                                    |
| • Discuss the mechanism of Phonation  |  |
| <b>15. Malnutrition</b>   |  |
| • Explain the types of malnutrition   |  |
| • List 5 most common causes of malnutrition.  |  |
| • Discuss the treatment plan for malnutrition   |  |
| <b>16. Sense of Olfaction &amp; Olfactory Pathway</b>   | Flipped classroom                                      |
| • List different types of olfactory sensation   |  |
| • Explain the olfactory pathway   |  |

**RESEARCH METHODOLOGY**

| TOPICS & OBJECTIVES  | LEARNING STRATEGIES                            |
|--|--|
| <b>1. Non-probability sampling</b>   | Interactive Lecture/<br>Small Group Discussion |
| • Define Non-Probability Sampling  |  |
| <b>2. Sampling technique of research synopsis</b>                              |  |
| • Explain the Sampling technique of the research synopsis                      |  |
| <b>3. Types of data &amp; variables</b>  |  |
| • Describe the types of data and variables                                     |  |
| <b>4. Types of bias &amp; confounding variables</b>                            |  |
| • Discuss the types of bias & confounding variables                            |  |
| <b>5. Sample size calculation</b>  |  |
| • Calculate sample size on statistical software                                |  |
| <b>6. Data collection tool, Questionnaire development of research synopsis</b> |  |
| • Define research, its types, and its importance                               |  |
| • Discuss research questions   |  |
| • List characteristics of a good research question                             |  |
| • Phrase a research question correctly   |  |
| • Develop Data collection tool (questionnaire development )                    |  |
| • Discuss the ethical consideration in data collection                         |  |
| <b>7. Plan of analysis for synopsis</b>  |  |
| • List the tools of data analysis  |  |
| • Discuss the types of data analysis & Statistical tests used in data analysis |  |
| <b>8. Ethical consideration in data collection</b>                             |  |
| • Discuss the ethical consideration in data collection                         |  |
| <b>9. Informed consent form and budget Gantt chart</b>                         |  |
| • Explain the Informed consent form  |  |
| • Develop a Gantt chart for your synopsis                                      |  |

**LEARNING RESOURCES**

| <b>SUBJECT</b>      | <b>RESOURCES</b>  |
|---------------------|---|
| <b>ANATOMY</b>      | <p><b>A. <u>GROSS ANATOMY</u></b></p> <ol style="list-style-type: none"> <li>1. K.L. Moore, Clinically Oriented Anatomy</li> <li>2. Neuro Anatomy by Richard Snell</li> <li>3. <a href="https://www.kenhub.com/en/dashboard">https://www.kenhub.com/en/dashboard</a></li> </ol> <p><b>B. <u>HISTOLOGY</u></b></p> <ol style="list-style-type: none"> <li>1. B. Young J.W. Health Weather's Functional Histology</li> </ol> <p><b>C. <u>EMBRYOLOGY</u></b></p> <ol style="list-style-type: none"> <li>1. Keith L. Moore. The Developing Human</li> <li>2. Langman's Medical Embryology</li> </ol>  |
| <b>BIOCHEMISTRY</b> | <p><b><u>TEXT BOOKS</u></b></p> <ol style="list-style-type: none"> <li>1. Harper's Illustrated Biochemistry</li> <li>2. Lippincott's Illustrated Reviews of Biochemistry</li> <li>3. Lehninger Principle of Biochemistry</li> <li>4. Biochemistry by Devlin</li> <li>5. Essentials of Medical Biochemistry by Mushtaq Ahmed (2 Volumes)</li> </ol>  |
| <b>PHYSIOLOGY</b>   | <p><b>A. <u>TEXT BOOKS</u></b></p> <ol style="list-style-type: none"> <li>1. Textbook Of Medical Physiology by Guyton And Hall</li> <li>2. Ganong 'S Review of Medical Physiology</li> <li>3. Human Physiology by Lauralee Sherwood</li> <li>4. Berne &amp; Levy Physiology</li> <li>5. Best &amp; Taylor Physiological Basis of Medical Practice</li> </ol> <p><b>B. <u>REFERENCE BOOKS</u></b></p> <ol style="list-style-type: none"> <li>1. Guyton &amp; Hall Physiological Review</li> <li>2. Essentials Of Medical Physiology by Jaypee</li> <li>3. Text book Of Medical Physiology by Indu Khurana</li> <li>4. Short Textbook Of Physiology by Arthur</li> <li>5. NMS Physiology</li> </ol> |



**ASSESSMENT METHODS:**

- **Best Choice Questions(BCQs)** also known as MCQs (Multiple Choice Questions)
- **Objective Structured Practical/Clinical Examination (OSPE or OSCE)**

**Internal Evaluation**

- Students will be assessed comprehensively through multiple methods.
- 20% marks of internal evaluation will be added to JSMU final exam. That 20% may include class tests, assignments, practicals, and the internal exam which will all have specific marks allocation.

**Formative Assessment**

Individual departments may hold a quiz or short answer questions to help students assess their learning.

The marks obtained are not included in the internal evaluation

**For JSMU Examination Policy, please consult the JSMU website!**

More than 75% attendance is needed to sit for the internal and final examination



**LNH&MC EXAMINATION RULES & REGULATIONS**

- Students must report to the examination hall/venue, 30 minutes before the exam.
- **The exam will begin sharply at the given time.**
- No student will be allowed to enter the examination hall after 15 minutes of the scheduled examination time.
- Students must sit according to their roll numbers mentioned on these seats.
- **Cell phones are strictly not allowed in the examination hall.**
- If any student is found with the cell phone in any mode (silent, switched off, or on) he/she will not be allowed to continue their exam.
- No students will be allowed to sit in the exam without University Admit Card, LNMC College ID Card, and Lab Coat
- Students must bring the following stationary items for the exam: Pen, Pencil, Eraser, and Sharpener.
- In discipline in the exam hall/venue is not acceptable. Students must not possess any written material or communicate with their fellow students.

**SCHEDULE:**

| WEEKS                 | 2 <sup>nd</sup> YEAR                  | MONTH                          |
|-----------------------|---------------------------------------|--------------------------------|
| WEEK 1                | GIT & LIVER MODULE-I                  | 26 <sup>th</sup> December 2023 |
| WEEK 2                |                                       |                                |
| WEEK 3                |                                       |                                |
| WEEK 4                |                                       |                                |
| WEEK 5                |                                       |                                |
| WEEK 6                |                                       | 31 <sup>st</sup> January 2024  |
| WEEK 1                | NEURO SCIENCE MODULE-I                | 5 <sup>th</sup> February 2024  |
| WEEK 2                |                                       |                                |
| WEEK 3                |                                       |                                |
| WEEK 4                |                                       |                                |
| WEEK 5                |                                       |                                |
| WEEK 6                |                                       |                                |
| WEEK 7                |                                       | 19 <sup>th</sup> March 2024    |
| WEEK 1                | HEAD AND NECK & SPECIAL SENSES MODULE | 25 <sup>th</sup> March 2024    |
| WEEK 2                |                                       |                                |
| WEEK 3                |                                       |                                |
| WEEK 4                |                                       |                                |
| WEEK 5                |                                       |                                |
| WEEK 6                |                                       |                                |
| WEEK 7                |                                       | 17 <sup>th</sup> May 2024      |
| Mid-Term Examination* |                                       |                                |

\*Final dates will be announced later