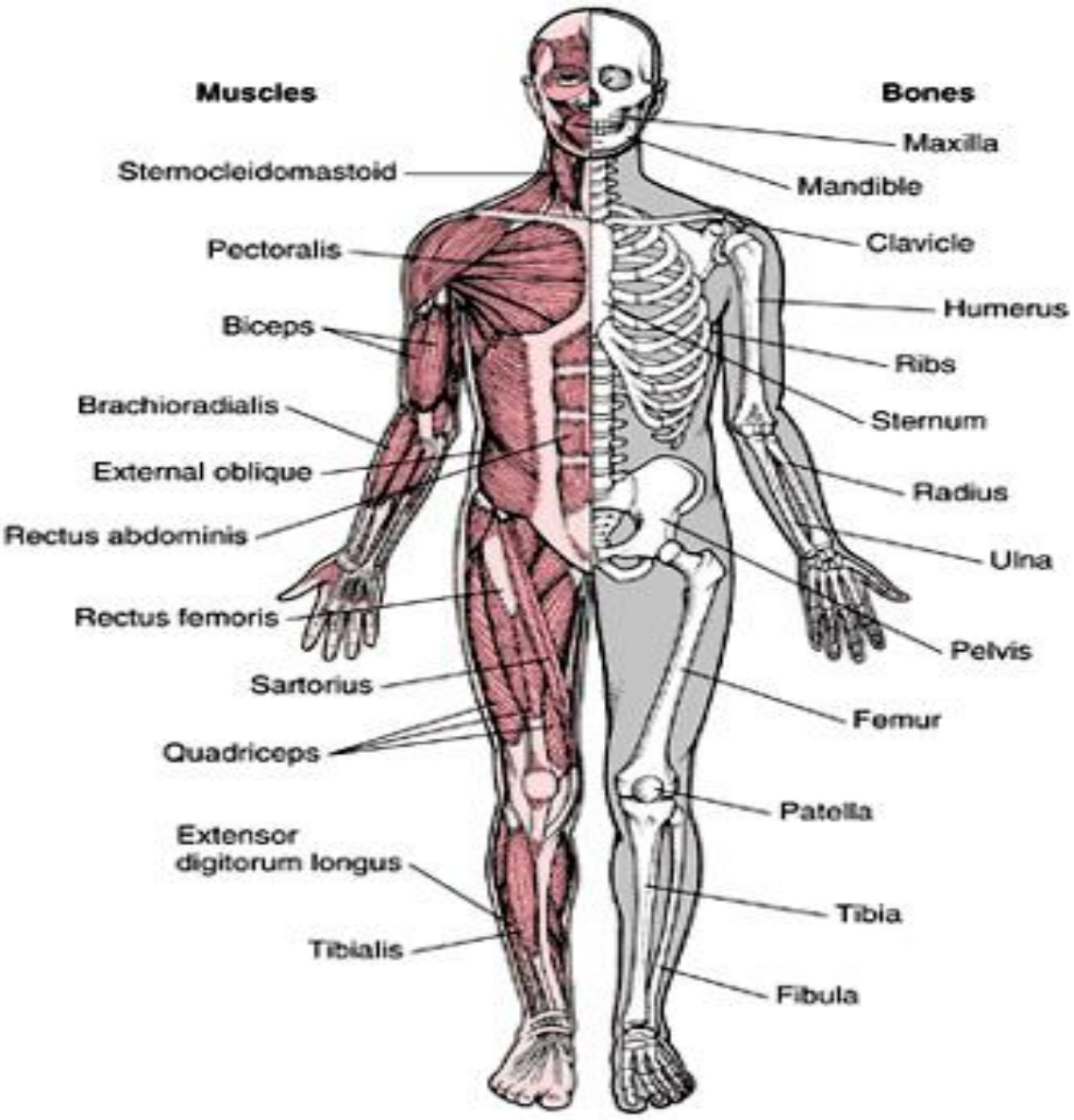
LOCOMOTOR II MODULE
29th May 2023 TO 21st June 2023



STUDY GUIDE FOR LOCOMOTOR-2 MODULE

Module name: ***Locomotor -2*** *Year:* ***Three*** *Duration:* ***4 weeks (May- June 2023)***

Timetable hours: **Lectures, Case-Based Learning (CBL), Clinical Rotations, learning experience in LNH outreach centers, Laboratory, Practical, Demonstrations, Skills, and Self-Study**

MODULE INTEGRATED COMMITTEE

MODULE COORDINATORS:	• Dr. Tabassum Zehra (**Pharmacology**) • Dr. Sana Farooq Shah (**DHPE**)

DEPARTMENTS & RESOURCE PERSONS FACILITATING LEARNING

BASIC HEALTH SCIENCES	CLINICAL AND ANCILLARY DEPARTMENTS
ANATOMY • Professor Zia-ul-Islam	***ORTHOPAEDICS*** • Dr. Kazim Rahim
COMMUNITY MEDICINE • Dr. Saima Zainab	***RADIOLOGY*** • Dr. Misbah Tahir
FORENSIC MEDICINE • Prof. Syed Mukkaram Ali	***RHEUMATOLOGY*** • Dr. Tahira Perveen
PATHOLOGY • Prof. Naveen Faridi	
MOLECULAR PATHOLOGY • Dr. Sobia Rafiq	
PHARMACOLOGY • Prof. Tabassum Zehra	
DEPARTMENT OF HEALTH PROFESSIONS EDUCATION • Professor Nighat Huda • Professor Sobia Ali • Dr. Afifa Tabassum • Dr. Sana Farooq Shah • Dr. Ahsan Naseer • Dr. Yusra Nasir	
LNH&MC MANAGEMENT • Professor KU Makki, Principal LNH&MC • Dr. Shaheena Akbani, Director A.A & R.T LNH&MC	

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 Interactive Lectures, small group teachings, clinical skills, demonstrations, tutorials, 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 module 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 FRAMEWORK

Students will experience an integrated curriculum similar to previous modules**.**

INTEGRATED CURRICULUM comprises system-based modules such as Foundation II, Blood II, Locomotor II, Respiratory system-II, CVS-II, and GIT Liver II 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.

LEARNING EXPERIENCES: Case-based integrated discussions, and skills acquisition in the skills lab. Computer-based assignments, learning experiences in clinics, wards, and outreach centers

INTEGRATING DISCIPLINES OF LOCOMOTOR MODULE-II

LEARNING METHODOLOGIES

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

- Interactive Lectures
- Tutorial
- Case- Based Learning (CBL)
- Clinical Experiences
  - Clinical Rotations
- Skills session
- Self-Directed Learning

INTERACTIVE LECTURES: In a large group, the Interactive Lectures introduce 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.

TUTORIAL: This format helps students to clarify concepts, and acquire skills or desired 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 Interactive Lectures, tutorials, and self-study. The facilitator's role is to ask probing questions, summarize, or rephrase to help clarify concepts.

CASE-BASED LEARNING (CBL): 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 previously in clinical and basic health sciences during the module and constructing new knowledge. The CBIL will be provided by the concerned department.

CLINICAL LEARNING EXPERIENCES: In small groups, students observe patients with signs and symptoms in hospital wards, clinics, and outreach centers. This helps students relate knowledge of the module's basic and clinical sciences and prepare for future practice.

- **CLINICAL ROTATIONS:** In small groups, students rotate in different wards like Medicine, Pediatrics, Surgery, Obs & Gyne, ENT, Eye, Family Medicine clinics, outreach centers & Community Medicine experiences. Here students observe patients, take histories and perform supervised clinical examinations in outpatient and inpatient settings. They also get an opportunity to observe medical personnel working as a team. These rotations help students relate basic medical and clinical knowledge in diverse clinical areas.

SKILLS SESSION: Skills relevant to the respective module are observed and practiced where applicable in the skills laboratory.

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.

LOCOMOTOR -2 MODULE

INTRODUCTION

For MBBS third-year students, the locomotor-2 module concentrates on knowledge and skills required for diagnosis, treatment, and prevention of conditions affecting the musculoskeletal system, ranging from common disorders of bone and cartilage to severely disabling limb trauma, accidents, and disasters.

The Locomotor-2 module learning objectives take into consideration previously acquired pertinent knowledge in the Locomotor module of MBBS the first year. The module integrates with related disciplines such as Community Medicine, Forensic Medicine, Microbiology, Pathology & Pharmacology. It is expected that different learning experiences would help students build new knowledge, and enhance students' understanding and motivation to seek further knowledge.

COURSE TOPICS, OBJECTIVES, AND TEACHING STRATEGIES

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

ANATOMY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
Gross & histological features of bones	Interactive Lecture
• Describe the processes of bone remodeling and bone growth	
• Name the different histological regions of bone	
• Explain the process of bone turnover	
• Describe the calcification processes of cartilage and bone	

COMMUNITY MEDICINE

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Accidents, Injury, and its Prevention	Tutorial
• Describe accidents	
• Describe the epidemiology of accidents and injury	
• Explain the risk factors for different types of injuries	
• Discuss measures for the prevention and control of accidents and injury	
2. Disaster management	Interactive Lecture
• Describe disaster	
• Enumerate the steps in planning a disaster management	
• Describe the steps of the surveillance cycle	
3. Sports medicine	Tutorial
• Describe sport medicine	
• Explain the role of sports physician in the practice of sports medicine	
• Discuss the female triad	
• Describe the pharmacological & legal aspects of Ergogenic aids in athletes	
4. Travel Medicine	
• Describe travel medicine	
• Describe epidemiology in travel medicine	
• Explain the risk for travelers	
• List the pathogens causing common traveler's diseases	
• Discuss the control measures for disease prevention among travelers	
• Discuss the role of international health regulation for travelers	
5. Ergonomics	Interactive Lecture
• Describe the concept of Ergonomics in Occupational Health	
• Describe the role of ergonomics science in the workplace	

FORENSIC MEDICINE

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Personal identity-I (Forensic odontology)	Tutorial
• Define complete and partial identification	
• Describe the different methods of identification via Third party, Subjective, and Objective	
• Discuss the role of identification in living and dead bodies with examples	
• Describe the parameters of identification	
• Mention the criteria for the determination of race	
• Determine age from Odontological data and X-rays	
2. Personal identity II (Age estimation by Radiology)	Tutorial
• Discuss sex determination and intersex states	
• Highlight the role of dactylography in the identification	
• Describe the medico-legal importance of age	
• Explain the medicolegal importance of general examination and ossification data in age determination	
• Determine age in at least 3 x-rays of long bones	
3. Personal identity- III (Sex determination from bones)	Tutorial
• Describe the molecular basis of DNA	
• Explain the DNA Typing techniques (RFLP, PCR, STR, MT DNA, Y Chromosome Analysis)	
• Discuss the methods of collection and uses of DNA evidence	
• Justify the use of DNA in forensic sciences	
• Discuss the features of male vs female skeleton	
• Determine sex from the following bones:	
i. Skull	
ii. Mandible	
iii. Thorax	
iv. Pelvis	
• Describe the determination of sex in intersex states	
4. Personal identity-IV (Osteometric indices)	Interactive Lecture
• Explain the identification of dead and decomposed bodies	
• Discuss the medico-legal importance of scars, acquired and congenital deformities, tattoo marks, and hair in the identification	
• Describe the role of Osteometric indices of bones in the determination of age, sex, and race	

5. Mass disasters	Interactive Lecture
• Define Mass disasters according to World Health Organization	
• Describe Triage and its types i.e. Simple, advanced, and Reverse	
• Explain the methods of identification of decomposed bodies, mutilated & burnt bodies, skeletal & fragmentary remains	
• Describe Super-imposition photography	
6. Firearm Injuries lecture –I	Interactive Lecture
• Describe basic terms related to ballistics & its types, types of cartridges/projectiles, and parts of a firearm weapon	
• List the types of gunpowder	
• Explain the mechanism of fire in firearm weapons	
7. Firearm injuries lecture – II	Interactive Lecture
• Describe characteristic features of the wound of entry and exit of firearms	
• Estimate distance of fire	
• List the features of fabricated firearm injuries	
• Explain the postmortem findings in cases of firearm injuries	

MOLECULAR PATHOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. molecular Basis of DNA I	Interactive Lecture
• Define key terms associated with the structure of DNA.	
• Identify the four nitrogen bases that compose DNA.	
• Describe the structure and function of DNA.	
• Explain the base pairing in the double helix of DNA.	
• Describe the chemistry of DNA.	
2. DNA Typing Techniques	
• Define key terms associated with DNA typing techniques	
• Describe the main and most important DNA typing methods	
• Explain the steps of DNA typing techniques	
• Describe the advantages and limitations of DNA typing methodologies	

ORTHOPAEDICS

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Types of Fractures	Interactive Lecture
• Classify different types of fractures	
• Discuss the general principles of management of the fracture	
2. Benign & malignant tumors of bones	
• Correlate pathological findings with clinical presentation of bone tumors	
• Justify diagnosis, investigations, and treatment plans for primary bone tumors	

PATHOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Overview of bone disease	Interactive Lecture
• Discuss briefly the matrix and cell components (osteoblast, osteoclast. Osteocytes) of bone	
• Summarize development, homeostasis, and remodeling of bone.	
2. Developmental Disorders of Bone and Cartilage	Interactive Lecture/ Tutorial
• Discuss	
i. Defect in nuclear proteins & transcription factors (Brachydactyly, Cleidocranial dysplasia)	
ii. Defects in hormones & signal transducing Proteins (Achondroplasia)	
iii. Defects in extracellular structural proteins (Osteogenesis Imperfecta), diseases associated with mutations of Types II, IX, X, and XI collagen)	
iv. Defect in metabolic pathways (Osteopetrosis).	
3. Acquired disorders of bone & cartilage I	Interactive Lecture
• Define osteopenia & osteoporosis	
• Categorize generalized osteoporosis	
• Discuss the pathophysiology of postmenopausal & senile osteoporosis	
• Describe the clinical & morphological features of osteoporosis	
• Define Paget disease (otitis deforms)	
• List the three phases of Paget disease	
• Discuss the pathogenesis of Paget disease	

• Describe the clinical & morphological features of Paget disease	
4. Acquired disorders of bone & cartilage II	Interactive Lecture
• Define rickets & osteomalacia.	
• Discuss the morphology & clinical features of rickets & osteomalacia.	
• Discuss the role of parathyroid hormone in calcium homeostasis.	
• Describe the morphological features of hyperparathyroidism.	
• Define renal osteodystrophy.	
• Discuss the pathogenesis of renal dystrophy	
5. Fractures & osteonecrosis	Interactive Lecture
• Define fractures	
• List the types of fractures	
• Describe the mechanism of bone repair after fractures	
• Define osteonecrosis	
• List the conditions that cause osteonecrosis	
• Discuss the morphology & clinical course of osteonecrosis	
6. Osteomyelitis	
• Define osteomyelitis	
• List the organisms causing osteomyelitis with various predisposing factors.	
• Discuss the route & causes of pyogenic osteomyelitis.	
• Describe the morphological & clinical features of pyogenic osteomyelitis.	
• Discuss briefly mycobacterial osteomyelitis & skeletal syphilis	
7. Bone Tumors and Tumor-Like Lesions I	Interactive Lecture/ Tutorial
• Discuss briefly Osteoid Osteoma and Osteoblastoma	
• Describe the pathogenesis, morphology, and clinical course of Osteosarcoma, Osteochondroma, Chondromas, and Chondrosarcoma	
8. Bone Tumors and Tumor-Like Lesions II	
• Describe the pathogenesis, morphology, and clinical course of Ewing Sarcoma, Giant Cell Tumor, and Aneurysmal Bone Cyst.	
• Discuss Fibrous Cortical Defect, Non-Ossifying Fibroma, Fibrous Dysplasia, and Metastatic Tumors.	
9. Degenerative joint disease (osteoarthritis)	Interactive LectuCase-Based d Learning
• Define osteoarthritis	
• Describe the pathogenesis of osteoarthritis	
• Discuss morphological & clinical features of osteoarthritis	
10. Autoimmune joint disease (Rheumatoid arthritis)	
• Define rheumatoid arthritis (RA)	
• Describe the pathogenesis & morphological features of RA	
• Discuss clinical & specific laboratory diagnostic features of RA	
• Discuss treatment & complications of RA	
11. Types of arthritis	Interactive Lecture
• Describe the pathophysiology of arthritis based on their types	
12. Crystal-induced arthritis (Gout & pseudo gout) Joint tumors & tumor-like conditions	Case-Based Learning
• Classify gout.	
• Describe the pathogenesis, morphology & clinical features of gout & pseudo-gout	

• Discuss briefly ganglion & synovial cyst	
• Discuss pathogenesis, morphology & clinical features of tenosynovial giant cell tumor	
13. Synovial fluid analysis in arthritis	Tutorial
• Correlate synovial fluid analysis with their representative disease	
14. Cartilage tumors	Interactive Lecture
• Describe osteochondroma, chondroma, and osteosarcoma	

PHARMACOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Pharmacology of Eicosanoids	Small Group Discussion
• Classify eicosanoids	
• Discuss the synthesis, receptor mechanisms, and organ system effects of eicosanoids	
2. Pain Management/ Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)-1	Interactive Lecture/ Tutorial
• Discuss the rationale of pain management	
• Classify NSAIDs	
• Describe their basic and clinical pharmacology	
3. Pain Management-II (Opioid Analgesics)	Interactive Lecture
• Discuss the role of opioids in the management of moderate to severe pain	
• Classify narcotic analgesics	
• Describe the basic and clinical pharmacology of narcotic analgesics	
4. Anti-Rheumatic Agents-I & II	
• Classify the drugs used in the treatment of rheumatoid arthritis and osteoarthritis	
• Discuss their basic and clinical pharmacology	
5. Drug Used in Osteoporosis and Osteomalacia	Interactive Lecture
• Describe the rationale for the management of osteoporosis & osteomalacia	
• Classify the drugs used in the treatment of osteoporosis and osteomalacia	
• Discuss their basic and clinical pharmacology	
6. Drugs Used in Gout	Interactive Lecture
• Describe the Importance of management of gout	
• Describe the drugs used in the treatment of gout	
• Discuss their mode of action, pharmacokinetics, and adverse effects	
7. Pain Management	Tutorial
• Discuss the basic and clinical pharmacology of NSAIDs, opioids, and others used in pain management.	
Case-Based	Case-Based Learning/ Tutorial
• Classify the drugs used in the management of rheumatoid arthritis and osteoarthritis.	
• Discuss the basic and clinical pharmacology of drugs used in rheumatoid arthritis and osteoarthritis.	

RADIOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
1. Osteoprosis & Osteomalacia	Interactive Lecture
• Identify Radiological findings of Osteoporosis & Osteomalacia	
2. Osteoarthritis Osteoporosis	
• Identify Radiological findings of Osteoarthritis & Rheumatoid	

RHEUMATOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGIES
Juvenile idiopathic arthritis, Seronegative spondyloarthropathies, Infectious arthritis	Interactive Lecture
• Define juvenile idiopathic arthritis (JIA).	
• Compare JIA with rheumatoid arthritis.	
• Discuss briefly risk factors & their sub-classification.	
• Features of seronegative spondyloarthritis.	
• Discuss briefly ankylosing spondylitis, reactive arthritis, enteritis-associated arthritis & psoriatic arthritis.	
• Discuss the causative agents & presentation of suppurative, mycobacterial, Lyme & viral arthritis.	

Apart from attending daily scheduled sessions, students too should engage in self-study to ensure that all the objectives are covered

LEARNING RESOURCES

SUBJECT	*RESOURCES*
ANATOMY	**TEXTBOOKS** 1. K.L. Moore, Clinically Oriented Anatomy
COMMUNITY MEDICINE	**TEXTBOOKS** 1. Preventive and Social Medicine by K Park 2. Community Medicine by M Illyas 3. Basic *Statistics* for the Health Sciences by Jan W Kuzma
FORENSIC MEDICINE	**TEXTBOOKS** 1. Nasib R. Awan. Principles and practice of Forensic Medicine 1st ed. 2002. 2. Parikh, C.K. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology. 7th ed.2005. **REFERENCE BOOKS** 3. Knight B. Simpson's Forensic Medicine. 11th ed.1993. 4. Knight and Pekka. Principles of forensic medicine. 3rd ed. 2004 5. Krishan VIJ. Textbook of forensic medicine and toxicology (principles and practice). 4th ed. 2007 6. Dikshit P.C. Textbook of forensic medicine and Toxicology. 1st ed. 2010 7. Polson. Polson's Essential of Forensic Medicine. 4th edition. 2010. 8. Rao. Atlas of Forensic Medicine (latest edition). 9. Rao.Practical Forensic Medicine 3rd ed,2007. 10. Knight: Jimpson's Forensic Medicine 10th 1991,11th ed.1993 11. Taylor's Principles and Practice of Medical Jurisprudence. 15th ed.1999 **CDs:** 1. Lectures on Forensic Medicine. 2. Atlas of Forensic Medicine. **WEBSITES:** www.forensicmedicine.co.uk
PATHOLOGY	**TEXTBOOKS** 1. Robbins & Cotran, Pathologic Basis of Disease, 9th edition. 2. Rapid Review Pathology, 4th edition by Edward F. Goljan MD **WEBSITES:** 1. http://www.hematology.org/Educators/High-School.aspx#a2 2. http://imagebank.hematology.org/
PHARMACOLOGY	**A. TEXTBOOKS** 1. Lippincott Illustrated Pharmacology 2. Basic and Clinical Pharmacology by Katzung

ASSESSMENT METHODS:

- MCQs (Multiple Choice Questions)
- **Objective Structured Practical/Clinical Examination (OSPE or OSCE)**
- MCQs and unobserved OSPE will be conducted on the LNH&MC Moodle platform
- Observed OSPE will constitute multiple examiner-based stations

Internal Evaluation

- Students will be assessed comprehensively through multiple methods.
- 20% marks of internal evaluation will be added to JSMU final exam. That 20% includes mid-module & end of module examinations, mid-term & pre-professional examinations.

Formative Assessment

Individual departments may hold quizzes 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 examinations

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 the seats.
- Cell phones are strictly not allowed in the examination hall.
- If any student is found with a 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 exams 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.
- Indiscipline in the exam hall/venue is not acceptable. Students must not possess any written material or communicate with their fellow students.

SCHEDULE:

WEEKS	3RD YEAR	MONTH
5 WEEKS	CVS-II	2nd May 2023
		3rd June
4 WEEKS	LOCOMOTOR II	29th May 2023
		21st June 2023
4 WEEKS	RESPIRATORY II	31st July 2023
		26th August 2023
	MODULAR EXAM*	

*23rd June 2023 to 24th June 2023