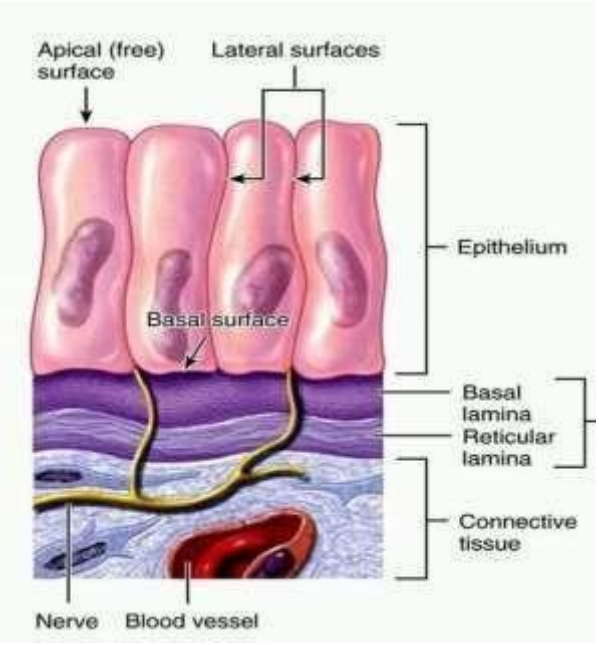
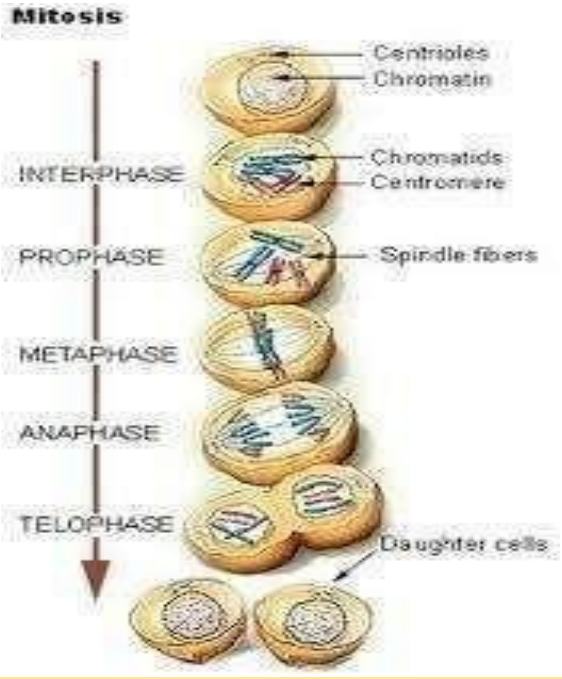
Study Guide- First Year MBBS

5th March – 30th April 2025



FOUNDATION MODULE I



LIAQUAT NATIONAL HOSPITAL AND MEDICAL COLLEGE
Institute for Postgraduate Medical Studies & Health Science

STUDY GUIDE FOR FOUNDATION MODULE

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Module name: **Foundation** *Year:* ***One*** *Duration:* ***7 weeks (March – April 2025)***

MODULE INTEGRATED COMMITTEE

MODULE COORDINATOR:	• Prof. Saima Athar (**Anatomy**)
CO-COORDINATOR:	• Dr. Faiza Agha (**Biochemistry**)

DEPARTMENTS & RESOURCE PERSONS' FACILITATING LEARNING

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BIOCHEMISTRY • Professor Faiza Waseem	PSYCHIATRY • Dr. Iqtidar Toufiq
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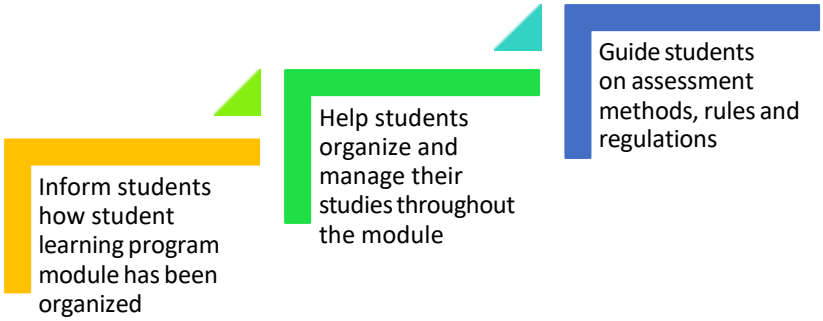
LNH&MC MANAGEMENT Professor KU Makki, Principal LNH&MC	
STUDY GUIDE COMPILED BY: Department of Health Professions Education	

INTRODUCTION

WHAT IS A STUDY GUIDE?

It is an aid to:



THE STUDY GUIDE:

- Communicates information on organization and management of the module.
- 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 in order to maximize their learning.
- Highlights information on the contribution of continuous and Term 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 pertaining to examination policy, rules and regulations.

CURRICULUM FRAMEWORK

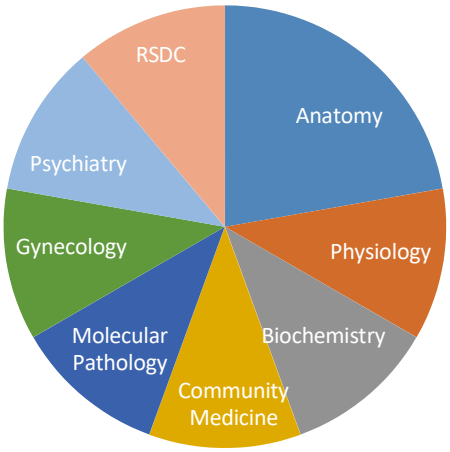
Students will experience integrated curriculum**.**

INTEGRATED CURRICULUM comprises system-based modules such as foundation and blood 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 better understanding of basic sciences when they repeatedly learn in relation to clinical examples.

Case-based discussions, computer-based assignments, early exposure to clinics, wards, and skills

acquisition in skills lab are characteristics of the integrated teaching program.

INTEGRATING DISCIPLINES OF FOUNDATION MODULE



LEARNING METHODOLOGIES

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

- Interactive Lectures
- Team- Based Learning
- Small Group Discussion
- Case- Based Learning
- Practical
- Skills session
- Self-Directed Study

INTERACTIVE LECTURES: In large group, 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.

TEAM- BASED LEARNING: Team-Based Learning is an evidence based collaborative learning teaching strategy designed around units of instruction, known as "modules," that are taught in a three-step cycle: preparation, (b) in-class readiness assurance testing, and (c) application-focused exercise.

Preparation before class: Students must complete preparatory materials before a class or the start of the module. Materials may be text, visual or other, and set at a level that is appropriate to the students and the course.

In-class Readiness Assurance Testing: Students complete an individual readiness assurance test (IRAT), consisting of 5 to 20 multiple choice questions. After submitting their individual answers, and they take the same test, the team RAT (TRAT), with their team. All members of each team share the same TRAT score, and both IRAT and TRAT scores count toward the students' grades.

Instructor Feedback: The instructor reviews material from the RAT that seems to be difficult for students. In-class application focused exercise: The remainder of the session is taken up with exercises that help students learn how to apply and extend the knowledge that they have pre-learned and tested. Teams are given an appropriate problem or challenge, and must arrive at a consensus to choose a "best" solution out of options provided. Teams then display their answer choice, and the educator facilitates a classroom discussion between teams to explore the topic and the possible answers to the problem.

SMALL GROUP DISCUSSION (SGD): This format helps students to clarify concepts acquire skills or attitudes. Sessions are structured with the help of specific exercises such as patient case, interviews or discussion topics. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator 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 around a series of questions based on a clinical scenario. Students' discuss and answer the questions applying relevant knowledge gained in clinical and basic health sciences during the module.

PRACTICAL: Basic science practical related to anatomy, biochemistry and physiology are scheduled for student learning.

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

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

MODULE 1: FOUNDATION

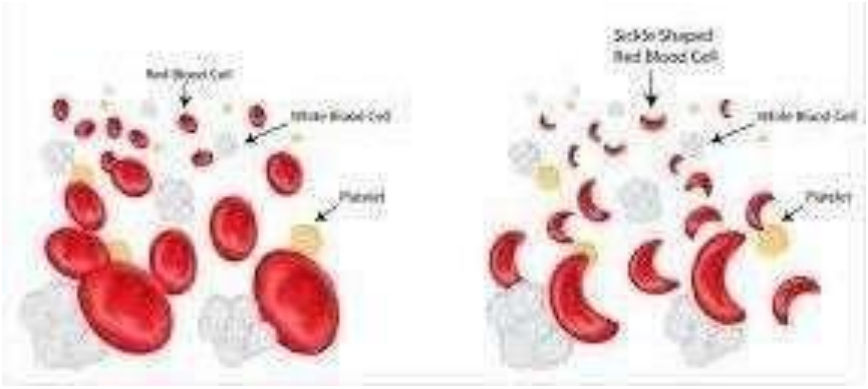
INTRODUCTION

This module has been designed to introduce you to the basics of health sciences. The course covers the molecular level of cell biology including genetics and its role in embryology, microbiology and pathology.

You will also experience clinical skills such as learning to communicate effectively so that you can relate to patients and their loved ones with compassion and understanding in coming years. Through working within teams, your co-operative and approachable working style will be enhanced. Through group and individual work, you will develop problem solving skills to apply your medical knowledge to practical situations. This, supplemented by lectures, and practical classes, is a significant component of the course.

This study guide has been developed to help guide you and keep you focused on the objectives for this module.

Welcome to the field of medicine and hope that the journey ahead will be exciting and fulfilling for you all!!



TOPICS, COURSE OBJECTIVES AND STRATEGIES

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

ANATOMY

OBJECTIVES	LEARNING STRATEGY
I. GENERAL ANATOMY	Interactive Lecture/Tutorial /Small Group Discussion
1. Levels of organization of Human Body	
• Describe the organization of the body from cellular to system level	
2. Anatomical terminologies: positions and planes	
• Differentiate among the various positions and planes of the body	
3. Terms of movement	
• Define the movements occurring at various joints of body (flexion, extension, abduction,	
adduction, rotation)	
• Identify movements occurring at specific joints (pronation, supination, inversion, eversion)	
• Identify the planes at which movements occur	
4. Bones-I: Classification	
• Classify bone on the basis of shapes and region	
• Describe the gross structure of young and adult bone	
5. Bones-II: Ossification, Blood supply of long bones, Cartilage, Bone Markings	
• Explain the ossification of bone	
• Identify the centers of ossification and their significance	
• Distinguish between intramembranous and endochondral ossification	
• Define bone markings with examples	
• List the types of cartilage	
• Describe the general anatomical features of each type of cartilage with example	
6. General Concept of Muscles I	Interactive Lecture
• List the components of muscular system.	
• Classify the muscles according to their fascicular architecture with example	
7. General Concept of Muscles II	
• Classify the muscles according to direction of fibers and their actions with example	
• Explain the principles of innervation and blood supply of muscles.	
8. General concept of joints	
• Define joint	
• Classify the joints on the basis of structure (uniting material) with example	
• Define a synovial joint	

• List the features of synovial joint	
• Classify Synovial joints on the basis of shape of articulating surfaces and degree of mobility	
• Explain the principles of innervation and blood supply of synovial joints	
9. Nervous system- I: Somatic nervous system and typical spinal nerve	
• List the basic divisions of Nervous system	
• Define the various components of Central and Peripheral nervous systems (CNS and PNS)	
• Describe the structure of Neuron	
• Classify neurons on the basis of number of processes and length of fibers	
• Define a nerve and its coverings	
• Differentiate between myelinated and unmyelinated fibers	
• List various types of Neuroglia	
• State their functions	
• Define a spinal nerve	
• List the spinal nerves in different regions	
• Identify their location and site of emergence	
• Identify various components of a typical spinal nerve	
• Describe the fate of rami	
• Describe the distribution of gray rami	
10. Nervous system-II: Autonomic Nervous System (ANS)	
• Describe the anatomical components of ANS	
• Differentiate between sympathetic and parasympathetic systems based on gross structure and distribution	
11. Introduction to lymphatic system	
• Define lymphatic system, lymphatics and lymph nodes	
• Describe the structure of lymph nodes and their general distribution	
• List various lymphoid tissues and organs	
• Identify large lymphatic channels	
• Discuss the role of lymphatics in the spread of cancer	
12. Integumentary system -I	Interactive Lecture/Practical
• Define the term integumentary system	
• Discuss the functions of the skin	
• Differentiate between epidermis and dermis	
• Discuss the significance of tension lines	
13. Integumentary system - II	
• Discuss the main determinant of skin color	
• Identify the appendages of the skin	
• Differentiate between superficial and deep fascia	
II. GENERAL EMBRYOLOGY	
14. Terms of Embryology	Interactive Lecture/ Small Group Discussion
• Explain terms related to embryology	

• List steps of cell division during mitosis	
• Explain the significance of mitosis	
• Define Meiosis	
• List the steps of meiosis	
• Differentiate first and second meiotic divisions	
• State the phases of meiotic divisions	
• Justify the importance meiosis in both sexes	
• Differentiate between mitosis and meiosis	
15. Introduction to Reproductive Organs	Interactive Lecture
• Identify the male and female reproductive organs	
• Describe Ovarian cycle	
• Relate ovarian cycle with uterine cycle	
• Describe the cyclical changes occurring in uterus, preparation of uterus for implantation, and their endocrine control	
16. Oogenesis & Spermiogenesis	
• Define gametogenesis (oogenesis and Spermatogenesis)	
• Describe the process of oogenesis	
• Differentiate between primary and secondary oocytes	
• Compare the male and female gametes	
• Define gametogenesis	
• Describe the sequence events of spermatogenesis	
• Discuss the importance of mitosis and meiosis in spermatogenesis	
• List the steps in spermiogenesis	
• Differentiate between spermatogenesis and spermiogenesis	
17. Transportation of Ovum and fertilization	
• Explain transportation of sperm and ovum	
• Define fertilization	
• Discuss phases and results of fertilization	
• Discuss the clinical aspects of fertilization	
18. 1st week of development after fertilization	Interactive Lecture/ Small Group Discussion /Tutorial
• Discuss the formation of zygote	
• Explain the transport of zygote from ampulla of fallopian tube to the uterine cavity	
• Discuss initial stages of development by the process of cleavage.	
• Explain the formation of blastocyst	
19. 2nd Week of development	
• Define implantation	
• Explain the formation of outer and inner cell masses	
• Discuss the further development of outer cell mass (trophoblast)	
• Differentiate syncytiotrophoblast and cytotrophoblast with its microscopic appearance	
• Describe the process of implantation (day by day changes)	

• State the differentiation of embryonic pole and development of bilaminar germ disc with formation of Epiblast, hypoblast, and their cavities (amniotic cavity and primary yolk sac)	
• Discuss the development of the chorionic sac and Primary chorionic villi	
• Enumerate the abnormal sites for implantation (ectopic pregnancy) and the different diagnostic	
tools	
20. 3rd week of Development: Gastrulation, primitive streak and notochord	
• Define gastrulation (formation of three germ layers)	
• Discuss the development of primitive streak and related congenital anomalies (Sacrococcygeal Teratoma)	
• Describe the development of notochordal process, notochord canal, prechordal plate and cloacal membrane	
• Describe the location of allantois and its importance	
• Discuss the formation of secondary and tertiary chorionic villi	
• Describe the development of intra-embryonic coelom	
21. 3rd week of Development: Neurulation and somite formation	
• Define neurulation	
• Describe briefly the events occurring in neurulation	
• Describe briefly the formation of somites	
22. Embryonic Period	Interactive Lecture
• Define embryonic period	
• Describe folding of embryo in median and horizontal planes	
• List the derivatives of germ layers	
• List events with the corresponding weeks, occurring during the period	
23. Fetal Period	
• Define fetal period	
• Discus the factors affecting fetal period/growth.	
• Explain the week by week development of tissues and organs	
• Describe the different milestone in development of fetus	
• List the causes of fetal loss	
24. Amnion, Chorion, umbilical cord and Yolk-Sac, Disorders of amniotic fluid	
• List the fetal membranes	
• Describe the structure of amnion and chorion	
• Describe the formation, circulation and function of amniotic fluid	
• Discuss the development of chorion and its complications	
• Discuss the disorder related to amniotic fluid volume	
• Describe the relationship of twinning (multiple pregnancies) with fetal membranes	
• Describe the umbilical cord (morphology, composite structures, positioning and fate)	
• Discuss the fate of umbilical vesicle (yolk sac)	

25. Placenta	Interactive Lecture /Practical/ Tutorial
• Describe the changes in the maternal endometrium with formation of decidua and decidual reaction	
• Describe the different types of chorionic villi	
• Explain the development of placenta, both the fetal and maternal part	
• Describe the placental circulation and barrier	
• Describe the functions of placenta	
26. Prenatal diagnosis	Interactive Lecture
• Discuss prenatal diagnosis	
• List the types of prenatal diagnosis	
• Differentiate between amniocentesis, chorionic villus sampling, cordocentesis, ultrasonography,	
maternal AFP levels in terms of indication, time of performance and technique	
• Describe the indications and goals of prenatal diagnosis	
27. Congenital Malformations	Interactive Lecture/ Case- Based Learning
• Define congenital malformation	
• List the types of abnormalities (Disruptions, Deformations)	
• Discuss the common congenital anomalies	
28. Teratogenesis	Interactive Lecture
• Define Teratogenesis	
• Discuss the principles governing teratogenesis	
• Describe the teratogenic factors and their effects on the developing tissue	
III. GENERAL HISTOLOGY	
29. Tissue Preparation and staining	Interactive Lecture/ Practical
• Describe different stages of tissue preparation	
• List various types of stains	
• Describe Haemotoxylin and Eosin (HandE) staining	
30. Cell Membrane	Interactive Lecture
• Identify the structures of cell membrane	
• Describe the phospholipid bilayer and its composition	
• Explain the Fluid Mosaic Model of cell membrane	
31. Cytoplasm	
• Define cytoplasm	
• Discuss components and functions of cytoplasm	
32. Nucleus	
• Describe the structure of nuclear membrane	
• Explain the component of nucleus and different types of chromatin material	
33. Cell organelles	
• Describe various cell organelles	
34. Cytoskeleton	
• Define Cytoskeleton	
• Describe the composition and functions of cytoskeleton	

• Enumerate the types, distribution and functions of cytoskeleton	
• Describe the details of cytoplasmic filaments and microtubules	
35. Cell Cycle	
• Define cell cycle	
• Explain various stages of cell cycle	
• Explain the events of somatic cell division (mitosis)	
• Discuss the significance of S phase of cell cycle	
• Relate phases of cell cycle with the basis of development of cancer	
36. Epithelium	Interactive Lecture/ Practical
• Describe the types, locations and functions of epithelium	
• Describe the structural details of organization of cells in epithelium and other basic tissues of body	
• Explain their origin of germinal layer and their derivatives	
37. Cell Junctions	
• Define cell junction	
• Name the junctions along the lateral and basal surfaces of cells	
• Discuss the structure and functions of the five main types of cell junction	
• List the sites of distribution and components of junctional complex	
38. Glands	
• Define glands	
• Discuss the general feature and structure of exocrine glands	
• Classify exocrine glands on the basis of number of cells, their structure and types of secretions	
39. Connective Tissues (Components)	
• Define connective tissue	
• Differentiate connective from epithelial tissue	
• Describe the components of connective tissue	
40. Connective Tissues (Classification)	
• Classify different types of connective tissue	
• Identify different types of connective tissue under the microscope	
• State the distribution of each type	
41. Histology of muscles	
• Describe the histological features of different types of muscular tissue and their location	

BIOCHEMISTRY

OBJECTIVES	LEARNING STRATEGY
TOPIC 1: WATER	Interactive Lecture/Tutorial
1. Chemical nature of water	
• Describe the structure and properties of water.	
• Discuss the physicochemical properties of water (e.g. surface tension, viscosity, adsorption)	
• Explain the role of water as a Solvent	
• Describe the role of water in forming molecular bonds.	
2. Distribution of water	
• Discuss the water distribution and homeostasis	
• Explain the clinical aspects of water disturbances	
3. pH and Buffers	
• Describe the mechanism of dissociation of water and maintenance of normal pH	
• Discuss the change in pH due to the addition of a given quantity of acid or base	
• Describe the role of buffers in maintaining pH	
• Explain the Henderson–Hassel Balch equation	
TOPIC 2: CELL	
4. Cell membrane	
• Describe the biochemical composition	
• Describe the functions of the cell membrane	
5. Cell organelles	
• Discuss the biochemical structure and function of each organelle	
TOPIC 3: CARBOHYDRATE CHEMISTRY	Interactive Lecture/Tutorial/ Practical
6. Carbohydrate Classification	
• Define carbohydrates with examples	
• Classify carbohydrates with examples	
• Describe the biochemical role of carbohydrates	
7. Monosaccharaides	
• Classify Monosaccharaides with examples	
• Explain chiral carbon and isomerism with examples	
• Explain the properties and functions of Monosaccharaides	
8. Disaccharides and Oligosaccharides	
• Classify Disaccharides with examples	
• Explain the properties and functions of Disaccharides	
• Classify Oligosaccharides with examples	
• Explain the properties and functions of Oligosaccharides	

9. Polysaccharides	
• Classify Polysaccharides with examples	
• Explain the properties and functions of Polysaccharides	
• Describe the clinical importance of Polysaccharides	
TOPIC 4: LIPID CHEMISTRY	
10. Lipid Classification	
• Define Lipids with examples	
• Classify Lipids with examples	
• Describe the biochemical functions of lipids	
11. Fatty acids	
• Explain the chemical structure of fatty acids.	
• Classify fatty acids with examples	
• Describe the properties and functions of fatty acids	
12. Simple and Compound Lipids	
• Classify simple and compound lipids with examples.	
• Explain the chemical structure of simple and compound lipids	
• Describe the properties and biological functions of simple and compound lipids	
• Discuss the clinical importance of Lipid storage diseases	
• Discuss the clinical significance of plasma lipoproteins	
13. Steroids and Sterols	
• Explain the structure and biochemical importance of steroids and sterols.	
• List the sources and functions of Cholesterol	
• Discuss the clinical importance of Cholesterol	
14. Eicosanoids	
• Define Eicosanoids with examples	
• Classify Eicosanoids with examples	
• Explain the functions of Eicosanoids	
• Explain the synthesis of Eicosanoids.	
• Discuss the clinical significance of Eicosanoids	
TOPIC 5: PROTEIN CHEMISTRY	Interactive Lecture
15. Amino acids	
• Describe the structure and classification of amino acids with example	
• Describe the properties of amino acids	
• Describe the functions of amino acids	
16. Peptides and Polypeptides	
• Describe the structure and classification of Peptides and Polypeptides with examples	
• Describe the characteristics of the Peptide bond	
• Describe the functions and biomedical importance of Peptides and Polypeptides	
17. Chemistry of Proteins	

• Define proteins with examples		
• Classify proteins with examples		
• List the sources and properties of proteins		
• Describe the functions and biomedical importance of individual proteins		
18. Protein Structure		
• Explain the structure of proteins		
TOPIC 6: NUCLEIC ACID CHEMISTRY		
19. Nucleotides		
• Describe the structure and classification of nitrogenous bases with examples		
• Compare the structures of nucleotides and nucleosides		
• Discuss the biomedical functions of nucleotides		
• Explain the biomedical significance of nucleotide derivatives and synthetic analogues.		
20. Chemistry of Nucleic acids		
• Classify DNA and RNA with examples		
• Explain the properties of nucleic acids		
• Describe the structure and functions of DNA and RNA		
TOPIC 7: ENZYME CHEMISTRY		
21. Classification of Enzymes		
• Define enzymes with examples		
• Classify enzymes with examples		
• Describe the structure and properties of Enzymes		
• Explain Co-enzymes, Co factors, zymogens, prosthetic group and Isoenzymes		
22. Enzyme Kinetics	Interactive Lecture/Practical	
• Explain the energy of activation		
• Explain the two hypothesis enzyme substrate binding.		
• Explain mechanism of action of enzymes		
• Explain the MichaelisMenten Model of enzyme kinetics		
23. Factors affecting enzyme activity		
• Discuss factors inhibiting and promoting enzyme activity		
• Define enzyme inhibitors with examples		
• Classify enzyme inhibitors with examples		
24. Clinical Enzymology		
• Explain the diagnostic importance of enzymes and isoenzymes		
• Outline different ways of measuring plasma enzymes		
• List enzymes and isoenzymes commonly assayed for diagnostic purposes		
• Discuss the clinical importance of isoenzymes of LDH, CPK, Troponin, Alkaline phosphatase and Aldolase		
25. TOPIC 8: VITAMINS		
• Define vitamins with examples	Interactive Lecture	
• Classify vitamins with examples		
• Discuss the overall role of vitamins and their importance in normal body functions		

• Describe the chemical structure and functions of individual vitamins	
• List the sources, daily requirement, digestion absorption of individual vitamins	
• Describe the clinical significance of deficiency and toxicity of vitamins	

PHYSIOLOGY

OBJECTIVES	LEARNING STRATEGY
1. Body Fluid Compartments	Interactive Lecture/Tutorial/ Practical
• Describe functional organization of human body.	
• Compare the normal ranges, physical characteristics of extracellular and intracellular fluid compartments	
2. Homeostasis and control system of body	Interactive Lecture/Tutorial
• Define homeostasis and maintenance of internal environment by positive and negative feedback mechanism.	
• Explain the feedback mechanisms with the help of examples.	
• Discuss the role of feedforward mechanism in homeostasis	
3. Functional importance of Cell membrane	
• Describe the structure and fluid mosaic model of cell membrane and its functional importance.	
• Explain the functional importance of lipids, integral proteins and carbohydrates in the cell membrane.	
4. Cell organelles 1	
• Describe the structure and functions of Ribosomes, Endoplasmic reticulum and Golgi apparatus	
5. Cell organelles 2	
• Describe the structure and functions of Lysosomes, Mitochondria, peroxisomes and cytoskeleton	
6. Transport across cell membrane (Passive)	
• Describe the types of passive transport across the membrane: Simple diffusion, Facilitated diffusion and Osmosis.	
• Define osmolarity, osmolality and osmotic pressure along with their functional importance and normal values.	
7. Transport across cell membrane (Active)	
• Describe the types of Active transport across cell membrane: Primary and Secondary active Transport.	
• Explain the role of sodium potassium pump in transport mechanism.	
• Discuss secondary active transport along with the examples of co-transport and counter-transport.	
8. Specialized functions of cell	
• Explain the process of endocytosis, exocytosis and transcytosis.	
9. Cell signaling mechanism	
• Discuss the activation of receptors and second messengers by cell signaling.	

• Explain the various types of membrane receptors and their up regulation/down regulation.	
10. Locomotion of cell and Apoptosis	
• Define the various types of cell locomotion: Ameboid and Ciliary movements.	
• Define Apoptosis and its mechanism.	
11. Introduction to Autonomic Nervous System	
• Explain the functional division of Autonomic Nervous System.	
• Discuss the role of sympathetic and para-sympathetic nervous system, their neurotransmitters and receptors in body systems.	

MOLECULAR PATHOLOGY

OBJECTIVES	LEARNING STRATEGY
• Describe the basic principal of genetics • List the Data bases and online resources for genetics	Practical/Small group session

STUDY SKILLS (DEPARTMENT OF HEALTH PROFESSIONS EDUCATION)

OBJECTIVES	LEARNING STRATEGY
MODULE ONE: Know your learning style • Identify your own learning styles • Identify your own learning approaches • Identify learning strategies to improve your learning	Small group session
MODULE TWO: Getting most out of the lectures! • Identify the utility of learning techniques in terms of low, moderate and high utility techniques • Explain the strategies to use before lectures for improved learning such as: reviewing objectives, figures, pictorals and reading introduction and conclusion of text • Describe the strategies to use during lectures for improved learning such as: monitoring engagement, active listening and metacognitive notes taking • Describe key techniques to help students learn most efficiently such as: the Pomodoro, spaced practice, Feynman technique, Leitner technique, Concept mapping, and reflective writing	Small group session
MODULE THREE: Ace your exams! • Effectively plan their exam preparation through SMART goals setting • Develop a "personal development plan (PDP)" • Identify long term, midterm and short term exam preparation strategies	SDL ON MOODLE
MODULE FOUR: Surviving Medicine: Learning to prioritize yourself and Life Work balance • Identify potential stress factors • Describe a range of stress management strategies • Identify the support services and online apps available to help with stress management • Identify your priorities and effectively manage your time	Interactive lecture

LEARNING RESOURCES

SUBJECT	*RESOURCES*
ANATOMY	**A. GROSSANATOMY** 1. K.L. Moore, Clinically Oriented Anatomy 2. Neuro Anatomy by Richard Snell **B. HISTOLOGY** 1. B. Young J. W. Health Wheather's Functional Histology **C. EMBRYOLOGY** 1. Keith L. Moore. The Developing Human 2. Langman's Medical Embryology
BIOCHEMISTRY	**A. TEXTBOOKS** 1. Harper's Illustrated Biochemistry 2. Lehninger Principle of Biochemistry 3. Biochemistry by Devlin 4. Lippincott's Illustrated reviews of Biochemistry
PHYSIOLOGY	**A. TEXTBOOKS** 1. Textbook Of Medical Physiology by Guyton And Hall 2. Ganong ' S Review of Medical Physiology 3. Human Physiology by Laura lee Sherwood 4. Berne & Levy Physiology 5. Best & Taylor Physiological Basis of Medical Practice **B. REFERENCE BOOKS** 1. Guyton & Hall Physiological Review 2. Essentials Of Medical Physiology by Jaypee 3. Textbook Of Medical Physiology by Indu Khurana 4. Short Textbook Of Physiology by Mrthur 5. NMS Physiology

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

LNMC 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:

MODULE	DURATION	MONTH
Foundation	**7 Weeks**	**5th March – 30th April 2025**
Blood	**4 Weeks**	**5th May – 30th May 2025**
Mid Term Exam*		

*Final dates will be announced later