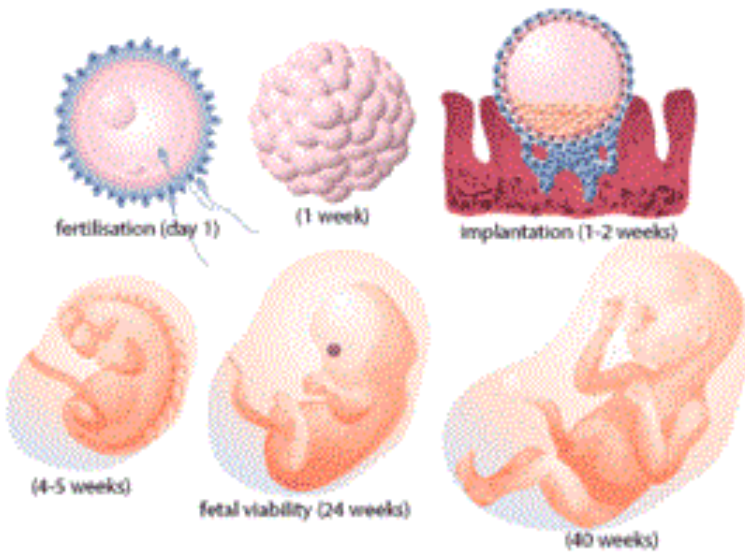


EMBRYOLOGY



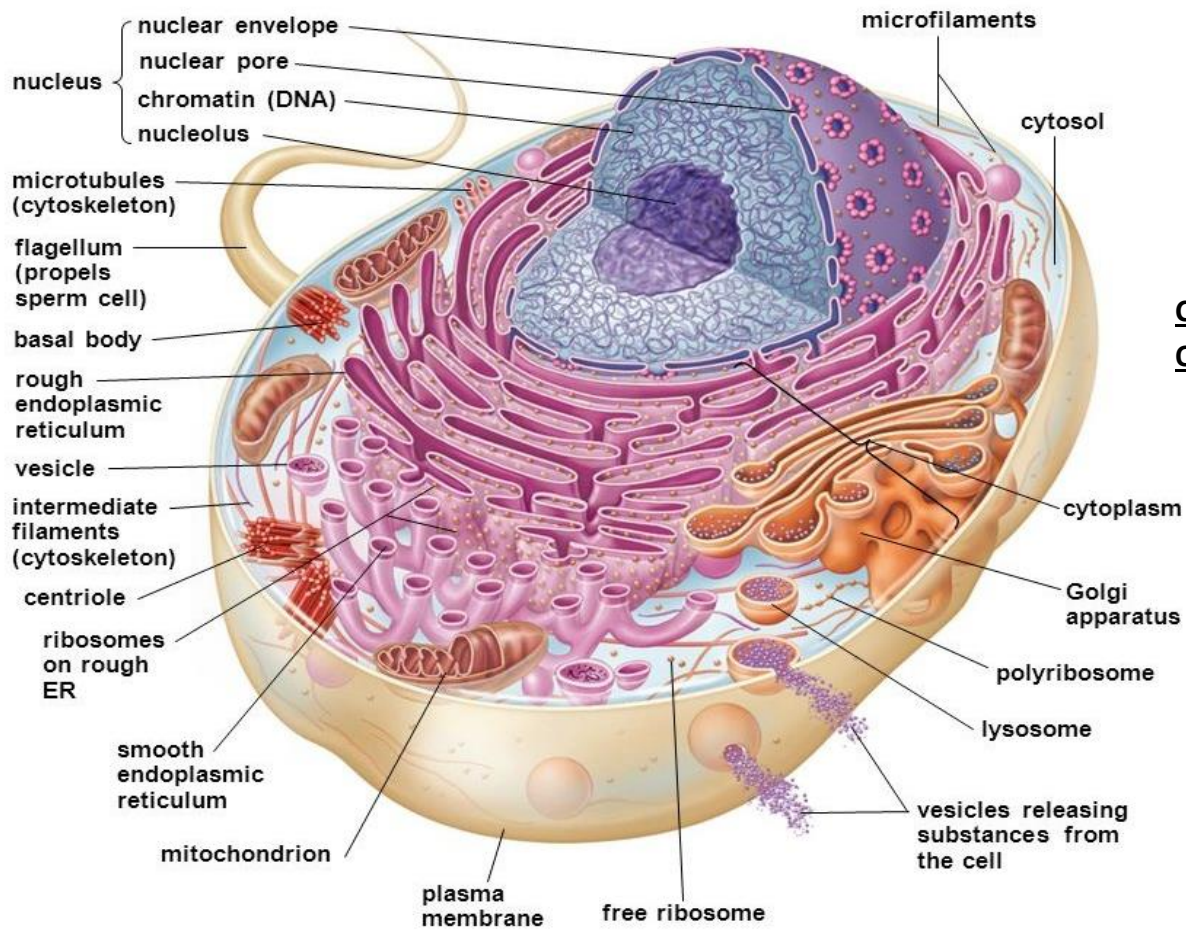
STUDY GUIDE

FOUNDATION MODULE

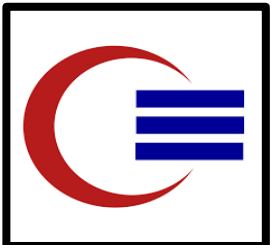
**FIRST YEAR MBBS
SEMESTER 1**

9th Feb – 26th March 2019

Duration: 6 weeks



**CELL &
ORGANELLES**



**LIAQUAT NATIONAL HOSPITAL
& MEDICAL COLLEGE**



STUDY GUIDE FOR FOUNDATION MODULE

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Module name: **Foundation**

Semester: **One**

Year: **One**

Duration: **6 weeks (Feb 2019 – March 2019)**

Timetable hours: **Lectures, Case-Based Learning (CBL), Self-Study, Practical, Skills, Demonstrations, Visit to Wards & Laboratory**

MODULE INTEGRATED COMMITTEE

MODULE COORDINATOR:	<ul style="list-style-type: none"> Professor Zia-ul-Islam (Anatomy)
CO-COORDINATORS:	<ul style="list-style-type: none"> Professor Nighat Huda, DHCE Dr. Saima Zainab (Community Medicine)

DEPARTMENTS' & RESOURCE PERSONS' FACILITATING LEARNING

BASIC HEALTH SCIENCES	CLINICAL AND ANCILLARY DEPARTMENTS
ANATOMY <ul style="list-style-type: none"> Professor Zia-ul-Islam Professor Masood Ahmed 	BIOETHICS <ul style="list-style-type: none"> Dr. Saleha Shahzad
BIOCHEMISTRY <ul style="list-style-type: none"> Professor Naheed Qadir 	COMMUNICATION SKILLS <ul style="list-style-type: none"> Mrs. Mehr Yahya
COMMUNITY MEDICINE <ul style="list-style-type: none"> Professor Rafiq Soomro 	MOLECULAR PATHOLOGY <ul style="list-style-type: none"> Dr. Israr Nasir
PATHOLOGY <ul style="list-style-type: none"> Professor Naveen Faridi 	RESEARCH & SKILLS DEVELOPMENT CENTER <ul style="list-style-type: none"> Dr. Kahkashan Tahir
PHYSIOLOGY <ul style="list-style-type: none"> Professor Syed Hafeezul Hassan 	
DEPARTMENT OF HEALTHCARE EDUCATION Professor Nighat Huda Dr. Sobia Ali Dr. Afifa Tabassum Dr. M. Suleman Sadiq Dr. Mehnaz Umair	
LNH&MC MANAGEMENT Professor KU Makki, Principal LNH&MC Dr. Shaheena Akbani, Director A.A & R.T LNH&MC	
STUDY GUIDE COMPILED BY: Department of Health Care Education	<ul style="list-style-type: none"> Dr. Muhammad Suleman Sadiq Dr. Sobia Ali

INTRODUCTION

WHAT IS A STUDY GUIDE?

It is an aid to:

- Inform students how student learning program of the semester-wise 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:

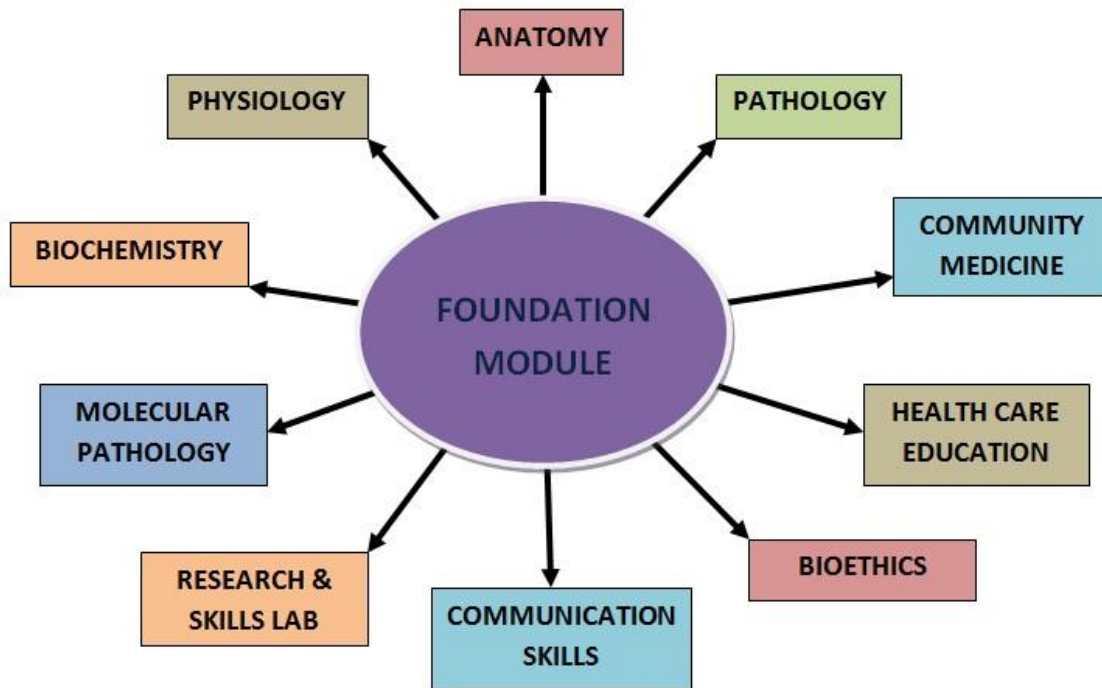
- Communicates information on organization and management of the module.
This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of the module.
- Identifies the learning strategies such as lectures, small 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, journals, for students to consult in order 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 pertaining to examination policy, rules and regulations.

CURRICULUM FRAMEWORK

Students will experience *integrated curriculum* of the 1st & 2nd semesters.

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 integrated teaching program.

INTEGRATING DISCIPLINES OF FOUNDATION MODULE**LEARNING METHODOLOGIES**

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

- Interactive Lectures
- Hospital / Clinic visits
- Small Group Discussion
- Case- Based Learning
- Practicals
- Skills session
- E-Learning
- 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.

HOSPITAL VISITS: In small groups, students observe patients with signs and symptoms in hospital or clinical settings. This helps students to relate knowledge of basic and clinical sciences of the relevant module.

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 practicals related to anatomy, biochemistry, pathology, pharmacology and physiology are scheduled for student learning.

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

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.

E-LEARNING: E-Learning is a strategy by which learning occurs through the utilization of electronic media, typically the Internet. The basic aspects of medical professionalism and ethics will be addressed through an e-learning course.

MODULE 1 : FOUNDATION

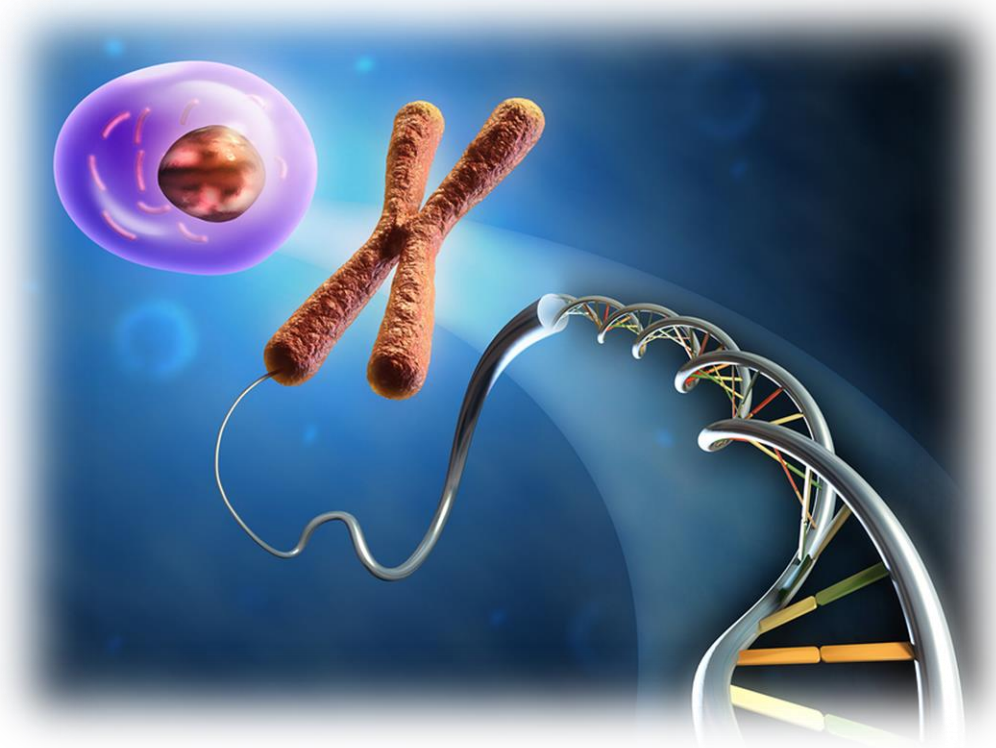
INTRODUCTION

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. In community medicine, health issues and policies on disease control at the national level will be discussed.

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:

OBJECTIVES	STRATEGIES
GENERAL HISTOLOGY	
<ul style="list-style-type: none"> • Explain the concept of organization of cells to tissue, tissues to organ and organs to system 	Interactive Lecture
<ul style="list-style-type: none"> • Describe the parts of microscope 	Practical
<ul style="list-style-type: none"> • Describe the structural organization of cell membrane and discuss the function of the components • Describe the structure and functions of the following cytoplasmic organelles: <ol style="list-style-type: none"> i. Golgi apparatus ii. Lysosomes iii. Peroxisomes iv. Smooth endoplasmic reticulum v. Rough endoplasmic reticulum vi. Ribosomes vii. Cellular inclusions viii. Mitochondria ix. Nucleus 	Interactive Lecture/Skills
<ul style="list-style-type: none"> • Describe the ultra structure and function of the cytoskeleton 	Interactive Lecture
<ul style="list-style-type: none"> • Describe cell junction complex 	
<ul style="list-style-type: none"> • Discuss the following basic tissues of the body <ol style="list-style-type: none"> i) Epithelium ii) Connective tissue iii) Muscle iv) Bones v) Cartilage vi) Neural tissue 	
<ul style="list-style-type: none"> • Describe the microscopic features of epithelial tissues, explain their functional importance and their surface modification 	
<ul style="list-style-type: none"> • With use of microscope identify the following: <ol style="list-style-type: none"> i. Epithelium ii. Connective tissue 	Practical

<ul style="list-style-type: none"> Name the basic histological stains. Define the following terms: <ol style="list-style-type: none"> Fixation Embedding Sectioning Staining 	Practical
<ul style="list-style-type: none"> Describe the microscopic features of connective tissues Differentiate between types of connective tissues: loose connective tissue, Adipose connective tissue, reticular connective tissue, dense connective tissue, regular and irregular 	Interactive Lecture
GENERAL EMBRYOLOGY	
<ul style="list-style-type: none"> Explain the basic terms related to embryology 	Small Group Discussion/Interactive lecture
<ul style="list-style-type: none"> Explain cell cycle, division, abnormal cell division and mutations Discuss the significance of karyo typing and its clinical significance 	Small Group Discussion
<ul style="list-style-type: none"> Differentiate between the stages of mitosis and meiosis 	
<ul style="list-style-type: none"> Discuss male reproductive organs and their functions 	
<ul style="list-style-type: none"> Discuss female reproductive organs and their functions 	
<ul style="list-style-type: none"> Describe the process of spermiogenesis, oogenesis and ovulation 	Interactive Lecture
<ul style="list-style-type: none"> Describe the phases of female reproductive cycles and their disturbance leading to polymenorrhoea, oligomenorrhoea and infertility 	Interactive Lecture/Case-Based Learning
<ul style="list-style-type: none"> Correlate the cyclic changes occurring in the ovary with that of uterus with their endocrine control 	Interactive Lecture
<ul style="list-style-type: none"> Describe the phases of fertilization 	
<ul style="list-style-type: none"> Discuss the results of fertilization 	
<ul style="list-style-type: none"> Discuss artificial reproductive techniques and Describe the steps involved during in vitro fertilization and embryo transfer 	Small Group Discussion
<ul style="list-style-type: none"> Describe cleavage and blastocyst formation 	Interactive Lecture

<ul style="list-style-type: none"> Discuss the results of implantation at abnormal site 	Interactive Lecture / Case-Based Learning
<ul style="list-style-type: none"> Describe the events of the second week of development including Formation of amniotic cavity, amnion, bilaminar embryonic disc, yolk sac, chorionic sac and primary chorionic villi 	Interactive Lecture
<ul style="list-style-type: none"> Describe the following events of the third week of development <ol style="list-style-type: none"> Formation of primitive streak and notochord Gastrulation Formation of neural tube Formation of somites Formation of intra embryonic coelom Formation of blood cells and blood vessels Formation of secondary and tertiary chorionic villi 	
<ul style="list-style-type: none"> Describe folding of embryo and its results 	
<ul style="list-style-type: none"> Discuss the derivatives of germ layers and neural crest cells 	Small Group Discussion /Tutorial
<ul style="list-style-type: none"> Describe the structure, development and functions of placenta and fetal membranes 	Interactive Lecture
<ul style="list-style-type: none"> Explain the developmental process during first three weeks of gestation 	Interactive Lectures / Small Group Discussion/Tutorial
<ul style="list-style-type: none"> Discuss the important events of embryonic period from 4th week to 8th week and during the organo-genetic period 	
<ul style="list-style-type: none"> Discuss the events of fetal period 	
<ul style="list-style-type: none"> Describe the types of twin / multiple pregnancies 	Interactive Lecture / Small Group Discussion / Case- Based Learning
<ul style="list-style-type: none"> Define teratogenesis. Classify the teratogens. Describe the basic principles of teratogenesis 	
<ul style="list-style-type: none"> Discuss the common congenital anomalies 	Case-Based Learning/Small Group Discussion
<ul style="list-style-type: none"> Calculate the expected date of delivery (EDD) and describe various methods used to assess fetal wellbeing 	Small Group Discussion /Tutorial
<ul style="list-style-type: none"> Identify the placenta, fetal membranes, umbilical cord, germ layers, stages of fertilization on a given model, photograph or specimen 	Practical

GENERAL ANATOMY	
<ul style="list-style-type: none"> • Discuss the history of anatomy 	Interactive Lecture
<ul style="list-style-type: none"> • Discuss anatomy including its various branches and state their practical application in different fields of medicine 	Small Group Discussion
<ul style="list-style-type: none"> • Discuss the various techniques related to living anatomy such as: <ol style="list-style-type: none"> i. Plain and contrast radiographs ii. Radio-opaque media iii. Special X-ray techniques like Barium meal and Angiography etc iv. Ultrasonography v. CT vi. MRI vii. Endoscopy 	
<ul style="list-style-type: none"> • Discuss the integration of structures and functions of human body by relating with the arrangement of different levels organization 	
<ul style="list-style-type: none"> • Describe the terms of position in relation to anatomical position: <ol style="list-style-type: none"> i. Anterior / Posterior ii. Ventral / Dorsal iii. Superior / Inferior iv. Caudal / Rostral v. Medial / Lateral vi. Proximal / Distal vii. Palmar / plantar viii. Superficial / Deep 	
<ul style="list-style-type: none"> • Describe the different anatomical planes 	
<ul style="list-style-type: none"> • Describe the terms of movements at joints: <ol style="list-style-type: none"> i. Flexion / Extension ii. Abduction / Adduction iii. Lateral rotation / Medialrotation iv. Pronation / Supination v. Plantar flexion / Dorsal flexion vi. Circumduction vii. Eversion / Inversion 	

<p>Introduction to Skeletal system (Bones and Joints)</p> <ol style="list-style-type: none"> i. Describe the parts of appendicular and axial skeleton ii. Discuss the functions of bone iii. Classify bones on the basis of shape, development, region and structure iv. Describe general concepts of development and ossification of bones v. List the parts of young bone vi. Explain the blood supply of long bones vii. Classify joint on the basis of structure, regions and functions. viii. Discuss the characteristics of synovial joints ix. Classify synovial joints on the basis of structure and movement x. Define dislocation, sprain and inflammation of joints 	Interactive Lecture
<p>Introduction to Muscular System:</p> <ol style="list-style-type: none"> i. Classify muscles ii. Define spasm, paralysis, atrophy and regeneration 	
<ul style="list-style-type: none"> • Discuss the following terms: <ol style="list-style-type: none"> i. Ossification ii. Ligament iii. Aponeurosis iv. Raphe v. Fascia vi. Tendon vii. Synovial sheath viii. Bursa 	Small Group Discussion
<ul style="list-style-type: none"> • Discuss the following: <ol style="list-style-type: none"> i. Arteries ii. Arterioles iii. Capillaries iv. Veins v. Venules vi. Anastomosis vii. Lymphatics 	
<p>Introduction to Nervous System:</p> <ul style="list-style-type: none"> • Discuss the general organization of nervous system • Classify nervous system on the basis of structure and function • Discuss the general organization of Autonomic Nervous System 	Interactive Lectures
<ul style="list-style-type: none"> • Describe reflex arc and list its components 	
<ul style="list-style-type: none"> • Describe gross anatomy of blood vascular system 	
<ul style="list-style-type: none"> • Integrate the function of defence with the general anatomy of lymph nodes and lymphatics 	Interactive Lectures
<ul style="list-style-type: none"> • Appreciate the function of support and protection by using the general anatomy of skin and fascias 	

BIOCHEMISTRY	
OBJECTIVES	STRATEGIES
INTRODUCTION TO BIOCHEMISTRY	
<ul style="list-style-type: none"> Define Biochemistry Discuss its role, importance and applications in medical practice 	Interactive Lectures
CELL	
<ul style="list-style-type: none"> Explain the cell organelles with their biochemical function Discuss the biochemical composition and functions of the cell membrane 	Interactive Lectures
WATER & pH	
<ul style="list-style-type: none"> Discuss the physicochemical properties of water (eg surface tension, viscosity, adsorption) Describe the mechanism of dissociation of water and maintenance of normal pH Discuss Buffers and their role in acid base balance. 	Interactive Lectures
CHEMISTRY OF CARBOHYDRATES	
<ul style="list-style-type: none"> Classify Carbohydrates Explain structure, functions and biochemical importance (in health and disease) of monosaccharides, disaccharides, oligosaccharides and polysaccharides 	Interactive Lectures
CHEMISTRY OF LIPIDS	
<ul style="list-style-type: none"> Classify Lipids Define Lipids Explain the chemistry, structure and functions of fatty acids. Describe properties and biological functions of simple lipids (TAG) and compound lipids (PL) Explain sterols (Cholesterol), their chemistry, structure and biochemical importance in health and disease 	Interactive Lectures
CHEMISTRY OF PROTEINS	
<ul style="list-style-type: none"> Classify Proteins with their biochemical importance Classify Amino Acids on the basis of structure, properties, nutritional significance and their biological role Define peptides, polypeptides Discuss the biomedical importance of peptides and polypeptides Explain the structure of proteins Classify protein on the basis of physicochemical properties, functions and chemical reactions; and recognize their importance in balanced diet and health Explain the primary, secondary and tertiary structure of protein 	Interactive Lectures
ENZYMES:	
<ul style="list-style-type: none"> Discuss the mechanism of action and kinetics of co-enzymes, co-factors and isoenzymes. Discuss Classification and properties of Enzyme activity. Discuss Factors and inhibitors of Enzyme activity. Discuss clinical enzymology 	Interactive Lectures

CHEMISTRY OF NUCLEIC ACIDS	
<ul style="list-style-type: none"> • Explain the nucleotide chemistry with their biomedical importance • Explain DNA and RNA structure and types. 	Interactive Lectures
PRACTICALS:	
<ul style="list-style-type: none"> • Discuss Lab Protocols and Lab Hazards • Demonstrate Safety measures while working in Biochemistry Lab • Prepare solutions with different concentrations • Detect the Carbohydrates (Scheme and Polysaccharides), Carbohydrates (Mono and Disaccharides), Lipid (Solubility, Emulsification, Saponification), Proteins (Scheme and General Tests), Amino acid, Individual Proteins (Albumin, Globulin, Casein) in a given solution • Demonstrate flame photometry • Perform qualitative test for salivary amylase 	Practical Performance/Skills

BIOETHICS	
OBJECTIVES	STRATEGIES
<ul style="list-style-type: none"> • Describe the desirable attitudes of a medical professional • Recognize the importance of respectful behaviour with teachers , staff and colleagues • Apply principles of integrity, honesty, truth telling and trustworthiness in academic situations 	Interactive Lecture/ Small Group Discussion

COMMUNICATION SKILLS	
OBJECTIVES	STRATEGIES
<ul style="list-style-type: none"> • Identify basic elements of communication skills • Recognize the impact of effective communication 	Interactive Lecture/ Small Group Discussion

COMMUNITY MEDICINE	
OBJECTIVES	STRATEGIES
<ul style="list-style-type: none"> • Discuss the concept of health and diseases 	Interactive Lecture

HEALTH CARE EDUCATION	
OBJECTIVES	STRATEGIES
<ul style="list-style-type: none"> • Identify different methods of assessment used in LNMC modular exams • Relate to LNMC assessment policies 	Interactive Lecture/ Small Group Discussion

PATHOLOGY	
OBJECTIVES	STRATEGIES
<ul style="list-style-type: none"> • Discuss the types and pathogenesis of edema 	Interactive Lecture

PHYSIOLOGY	
OBJECTIVES	STRATEGY
INTRODUCTION TO PHYSIOLOGY & FUNCTIONAL ORGANIZATION OF HUMAN BODY	
<ul style="list-style-type: none"> Recognize the importance of physiology in modern medicine 	Interactive Lecture/ Small Group Discussion
EXTRACELLULAR FLUID & INTERNAL ENVIRONMENT	
<ul style="list-style-type: none"> Describe functional organization of human body and fluid compartments 	Interactive Lecture/ Small Group Discussion
HOMEOSTASIS AND CONTROL SYSTEM OF BODY	
<ul style="list-style-type: none"> Recognize the role of physiochemical aspects for the maintenance of homeostasis 	Interactive Lecture/ Small Group Discussion
FUNCTIONAL IMPORTANCE OF CELL MEMBRANE	
<ul style="list-style-type: none"> Explain composition and basic structure of cell membrane its functional importance and adaptation 	Interactive Lecture/ Small Group Discussion
CELL ORGANELLES	
<ul style="list-style-type: none"> Describe the structure and functions of various cell organelles 	Interactive Lecture/ Small Group Discussion
TRANSPORT ACROSS CELL MEMBRANE (ACTIVE & PASSIVE)	
<ul style="list-style-type: none"> Describe membrane transport mechanism types and effects 	Interactive Lecture/ Small Group Discussion
BULK TRANSPORT, ENDOCYTOSIS, EXOCYTOSIS, TRANSCYTOSIS	
<ul style="list-style-type: none"> Describe different types of transport mechanism through cell membrane Describe diffusion and its physical basis 	Interactive Lecture/ Small Group Discussion
CELL SIGNALLING MECHANISM	
<ul style="list-style-type: none"> Discuss the chemistry of signals, receptors and importance of lipid and proteins in membranes. Cell growth and repair 	Interactive Lecture/ Small Group Discussion
PRACTICAL	
<ul style="list-style-type: none"> Effects of osmotic variations in ECF on cell 	Practical

RESEARCH & SKILLS LAB	
OBJECTIVES	STRATEGY
HAND WASHING	
<ul style="list-style-type: none"> Identify the indications of hand washing Demonstrate the protocols and steps of hand washing in sequential manner 	Small Group Discussion

LEARNING RESOURCES

<i>SUBJECT</i>	<i>RESOURCES</i>
ANATOMY	<p>A. <u>GROSS ANATOMY</u></p> <ol style="list-style-type: none"> 1. K.L. Moore, Clinically Oriented Anatomy 2. Neuro Anatomy by Richard Snell <p>B. <u>HISTOLOGY</u></p> <ol style="list-style-type: none"> 1. B. Young J. W. Health Wheather's Functional Histology <p>C. <u>EMBRYOLOGY</u></p> <ol style="list-style-type: none"> 1. Keith L. Moore. The Developing Human 2. Langman's Medical Embryology
BIOCHEMISTRY	<p>A. <u>TEXTBOOKS</u></p> <ol style="list-style-type: none"> 1. Harper's Illustrated Biochemistry 2. Lehninger Principle of Biochemistry 3. Biochemistry by Devlin
PHYSIOLOGY	<p>A. <u>TEXTBOOKS</u></p> <ol style="list-style-type: none"> 1. Textbook Of Medical Physiology by Guyton And Hall 2. Ganong ' S Review of Medical Physiology 3. Human Physiology by Lauralee Sherwood 4. Berne & Levy Physiology 5. Best & Taylor Physiological Basis of Medical Practice <p>B. <u>REFERENCE BOOKS</u></p> <ol style="list-style-type: none"> 1. Guyton & Hall Physiological Review 2. Essentials Of Medical Physiology by Jaypee 3. Textbook Of Medical Physiology by InduKhurana 4. Short Textbook Of Physiology by Mrthur 5. NMS Physiology

OTHER LEARNING RESOURCES

<u>Hands-on Activities/ Practical</u>	Students will be involved in Practical sessions and hands-on activities that link with the foundation module to enhance the learning.
<u>Labs</u>	<ul style="list-style-type: none"> Utilize the lab to relate the knowledge to the specimens and models available.
<u>Skill Labs</u>	<ul style="list-style-type: none"> A skills lab provides the simulators to learn the basic skills and procedures. This helps build the confidence to approach the patients.
<u>Videos</u>	Video familiarize the student with the procedures and protocols to assist patients.
<u>Computer Lab/CDs/DVDs/Internet Resources:</u>	To increase the knowledge students should utilize the available internet resources and CDs/DVDs. This will be an additional advantage to increase learning.
<u>Self Learning</u>	Self Learning is scheduled to search for information to solve cases, read through different resources and discuss among the peers and with the faculty to clarify the concepts.

ASSESSMENT METHODS:

Theory (knowledge): Best Choice Questions (BCQs) also known as MCQs (Multiple Choice Questions) are used to assess objectives covered in each module.

BCQs:

- A BCQ has a statement or clinical scenario followed by four options (likely answers).
- After reading the statement/scenario student select ONE, the most appropriate answer/response from the given list of options.
- **Correct answer carries one mark, and incorrect 'zero mark'. There is NO negative marking.**
- Students mark their responses on specified computer-based sheet designed for LNMC.

○ **Sample BCQs:**

A 25 year old patient presented with the complain of productive cough, breathlessness and wheezing. He has been diagnosed with chronic obstructive pulmonary disease.

The most common risk factor for the disease is:

- a) Air pollution
- b) Coal mining
- c) Infection
- d) Tobacco smoke**

OSPE: Objective Structured Practical Examination (See the proposed plan of OSPE)

- It may comprise between 12- 25 stations.
- The content may assess application of knowledge, or practical skills.
- Student will complete task in define time at one given station.
- All the students are assessed on the same content by the same examiner in the same allocated time.
- A structured examination will have observed, unobserved, interactive and rest stations.

- **Observed and interactive stations:**

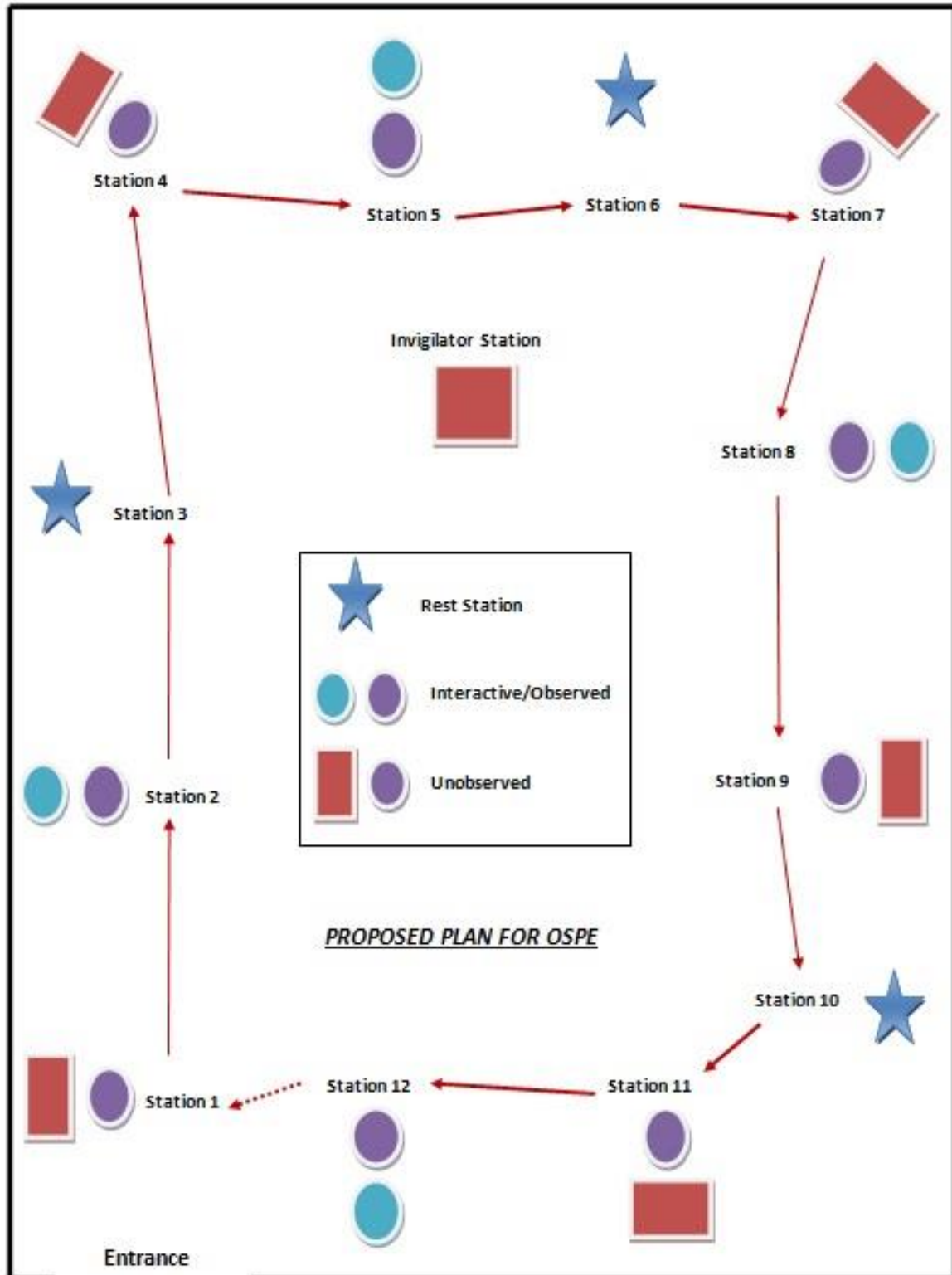
They will be assessed by internal or external examiners through the task or viva.

- **Unobserved station:**

It will be static station in which students will have to answer the questions related to the given pictures, models or specimens on the provided response sheet.

- **Rest station:**

It is a station where no task is given, and during this time student can organize his/her thoughts.



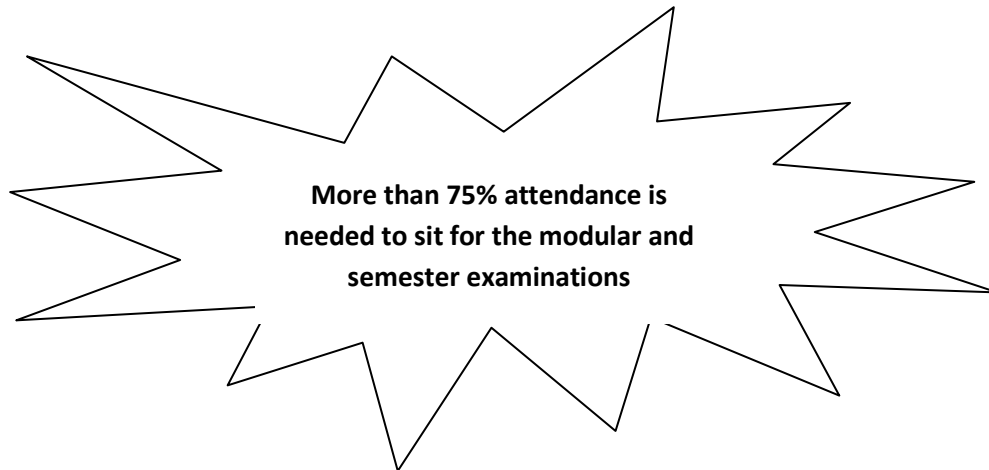
Internal Evaluation

- Students will be assessed to determine achievement of module objectives through the following:
 - **Module Examination:** will be scheduled on completion of each module. The method of examination comprises theory exam which includes BCQs and OSPE (Objective Structured Practical Examination).
 - **Graded Assessment of students by Individual Department:** Quiz, viva, practical, assignment, small group activities such as CBL, TBL, TOL, online assessment, ward activities, examination, and log book.
- Marks of both modular examination and graded assessment will constitute 20% weightage.
- As per JSMU policy, this 20% will be added by JSMU to Semester Examination.

Example : Number of Marks allocated for Semester Theory and Internal Evaluation			
Semester	Semester Examination Theory Marks	Internal Evaluation (Class tests + Journals + Assignments + Modular Exam)	Total (Theory)
	80%	20%	100%

Formative Assessment

- Individual department may hold quiz or short answer questions to help students assess their own learning. The marks obtained are not included in the internal evaluation



JSMU Grading System

- It will be based on GPA – 4 system

Marks obtained in Percentage range	Numerical Grade	Alphabetical Grade
80-100	4.0	A+
75-79	4.0	A
70-74	3.7	A-
67-69	3.3	B+
63-66	3.0	B
60-62	2.7	B-
56-59	2.3	C+
50-55	2.0	C
<50 Un-grade-able	0	U



MODULAR EXAMINATION RULES & REGULATIONS (LNH&MC)

- Student must report to examination hall/venue, 30 minutes before the exam.
- **Exam will begin sharp at the given time.**
- No student will be allowed to enter the examination hall after 15 minutes of scheduled examination time.
- Students must sit according to their roll numbers mentioned on the seats.
- **Cell phones are strictly not allowed in examination hall.**
- If any student is found with cell phone in any mode (silent, switched off or on) he/she will be not be allowed to continue their exam.
- No students will be allowed to sit in exam without University Admit Card, LNMC College ID Card and Lab Coat
- Student 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	1ST YEAR SEMESTER 1	MONTH
WEEK 1	FOUNDATION MODULE	11 th Feb 2019
WEEK 2		26 nd March 2019*
WEEK 3		
WEEK 4		
WEEK 5		
WEEK 6		
	MODULAR EXAM	29 th & 30 th March *
WEEK 1	BLOOD MODULE	1 st April 2019*
WEEK 2		May*
WEEK 3		
WEEK 4		
WEEK 5		
WEEK 6		
WEEK 7		
WEEK 8		
	MODULAR EXAM	May*
PREPARATORY LEAVE		
	SEMESTER EXAM	

*Final dates will be announced later