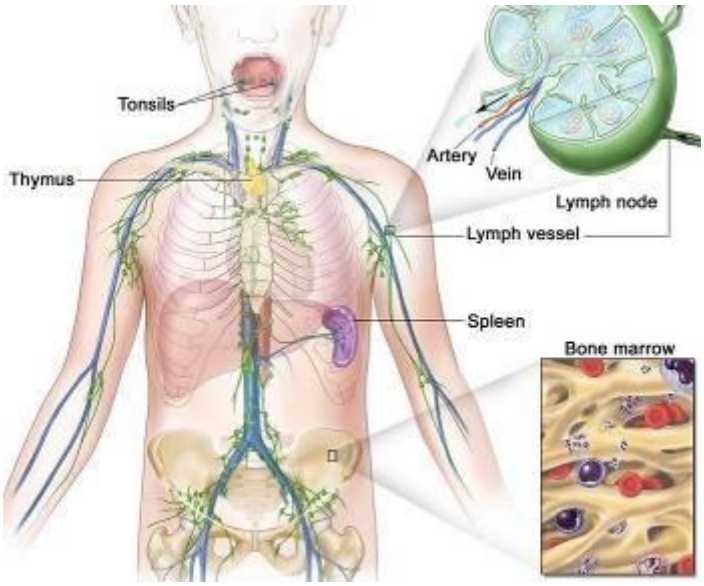
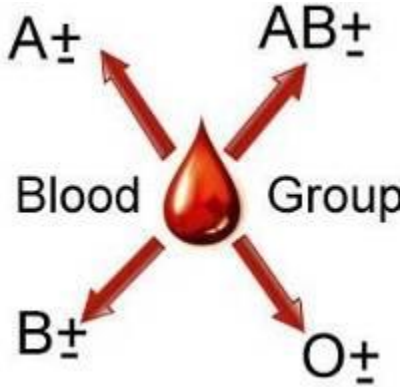


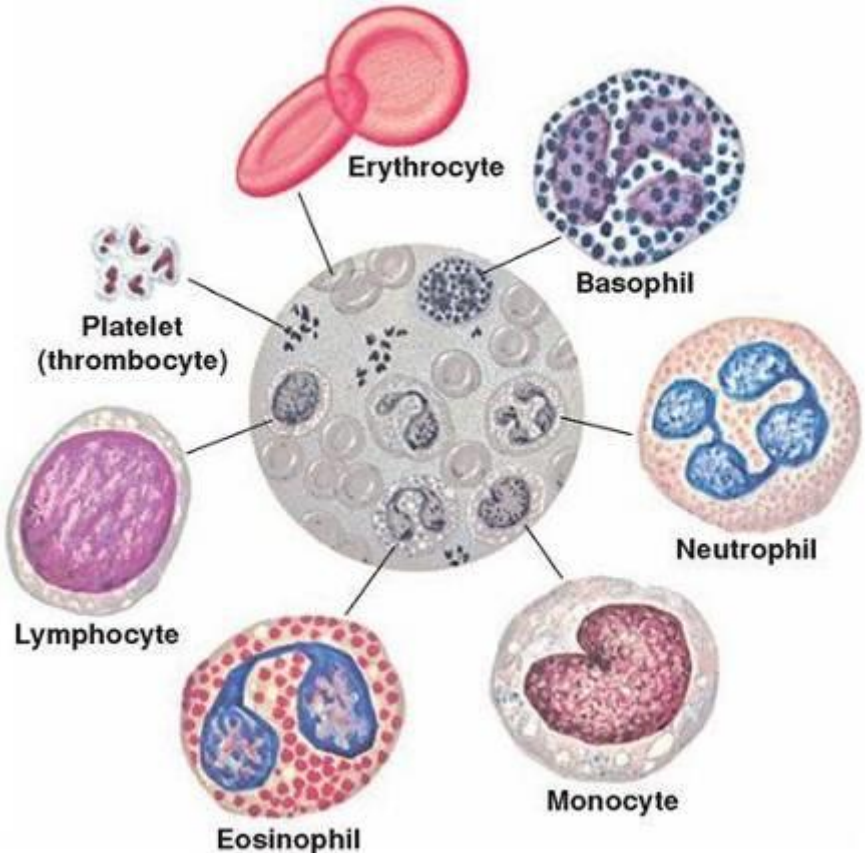
STUDY GUIDE

BLOOD MODULE

FIRST YEAR MBBS

6th April – 6th May 2020





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

STUDY GUIDE FOR BLOOD MODULE

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Module name: **Blood** *Year:* ***One*** *Duration:* ***4 weeks (April-May 2020)***

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

MODULE INTEGRATED COMMITTEE

MODULECOORDINATOR:	• Dr. Kashif Nisar (Biochemistry)
CO-COORDINATORS:	• Dr. Naila Raza (Haematology) • Dr. Mehnaz Umair (DHCE)

DEPARTMENTS'& RESOURCE PERSONS' FACILITATING LEARNING

BASIC HEALTH SCIENCES
ANATOMY Professor Zia-ul-Islam
BIOCHEMISTRY Dr. Kashif Nisar
PHYSIOLOGY Professor Syed Hafeezul Hassan
DEPARTMENT OF HEALTH PROFESSIONS EDUCATION • Professor Nighat Huda • Dr. Sobia Ali • Dr. Afifa Tabassum • Dr. Mehnaz Umair • Dr. M. Suleman Sadiq
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 Professions Education

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:

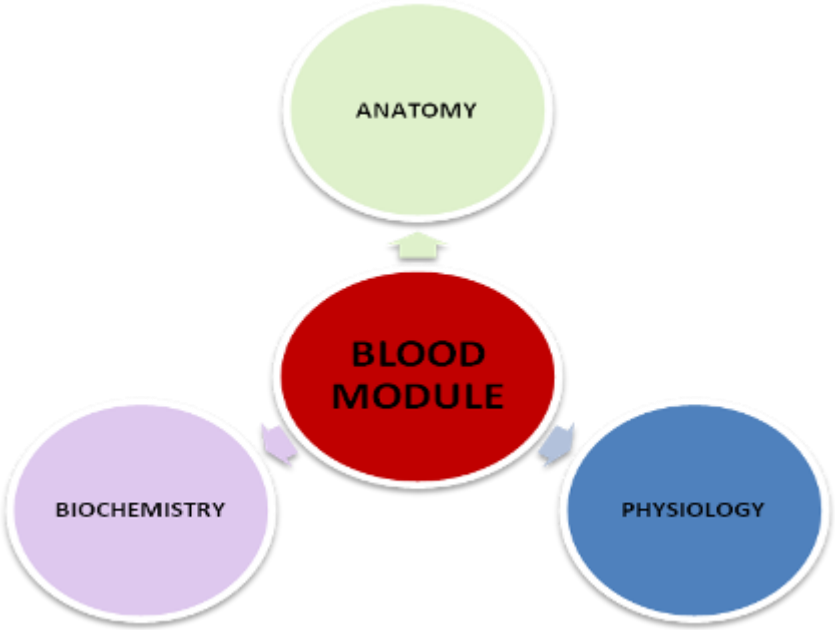
- Communicates information on organization and management of the module.
  This will help the student to contact the right person in case of any difficulty.
- Defines the objectives which are expected to be achieved at the end of the module.
- Identifies the learning strategies such as lectures, small 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***.**

INTEGRATED CURRICULUM comprises of 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 and physiotherapy department are characteristics of integrated teaching program.

DISCIPLINES OF BLOOD 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 under lying 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.

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 re phrase to help clarify concepts.

TEAM-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.

a) **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.
b) **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.
c) **Instructor Feedback**: The instructor reviews material from the RAT that seems to be difficult for students.
d) **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.

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.

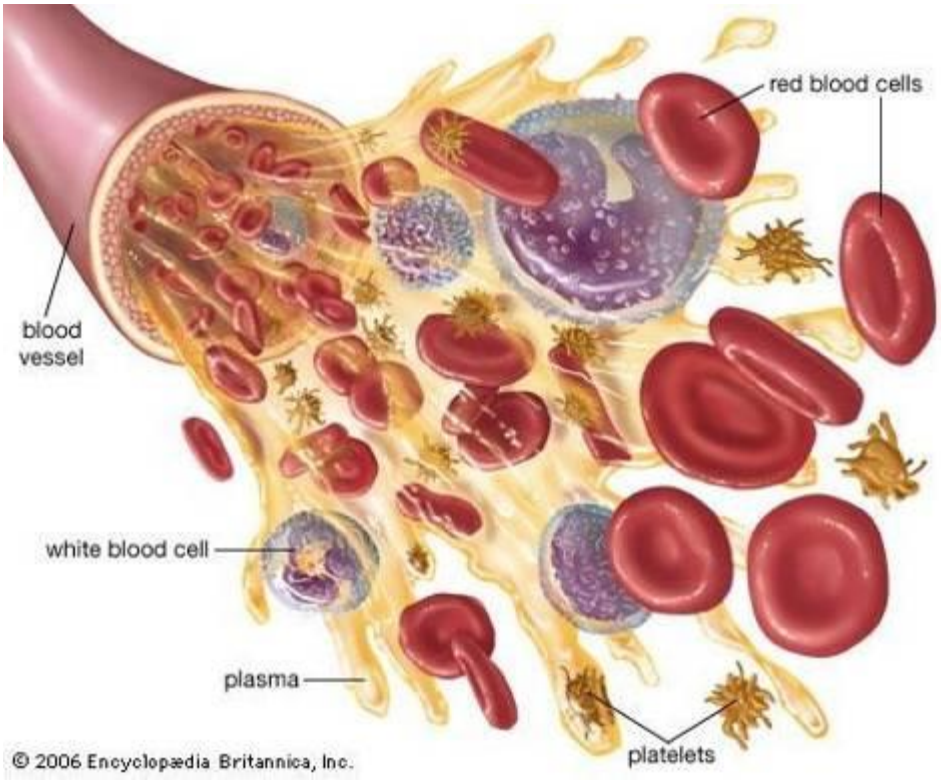
E-LEARNING: E-Learning is a strategy by which learning occurs through the utilization of electronic media, typically the Internet. The basic aspects of medical professionalism and ethics will be addressed through an e-learning course.

MODULE 2: BLOOD

INTRODUCTION

This module aims to provide the basic understanding of hematopoiesis and hemostasis at the molecular level. It will also outline the basic pathological processes in the development of cancers. It will deal with the basic pathophysiology and pharmacological aspects of infections and chemotherapeutic agents and integrate it with clinical sciences.

The module will give the 1st year medical students, an opportunity to know the presentations and principles of management of common hematological, immunological, inflammatory and neoplastic disorders. Overall, it will provide the students with the necessary factual knowledge and stimulate them to apply this in the interpretation of the disease.



COURSE OBJECTIVES AND STRATEGIES

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

ANATOMY

TOPICS & OBJECTIVES	*LEARNING STRATEGY*
HISTOLOGY:	
Lymphoid tissue, Immune system and Thymus	Interactive Lectures/Small Group Discussion
1. Name the components of immune system and lymphoid tissue	
2. Differentiate between central lymphoid organs and peripheral lymphoid organs	
3. Describe the structure of lymph nodes	
4. Describe the structure and histological appearance of thymus	
5. Discuss the clinical anatomy of lymphoid organs	
Histology of Spleen and Tonsils	
6. Define the structure and locations of tonsils.	Interactive Lectures/ SGD
7. Describe histological features of tonsils.	
8. Define the structure and locations of spleen.	
9. Describe the histological appearance of spleen.	
EMBRYOLOGY	
Development of blood	
10. Define hematopoiesis.	Interactive Lectures/ SGD
11. List the sites and source of hematopoiesis before and after birth	
Histology of Lymph Node and Thymus	Practicals
12. Enumerate lymphoid organs	
13. Briefly describe microscopic structure of lymphoid tissue	
14. Describe the structure of lymph nodes	
15. Explain the histological features of lymph nodes	
16. Describe the structure of thymus	
17. Explain the histological features of Thymus	
Histology of Spleen & Tonsil	
18. Describe the structure and locations of tonsils.	
19. Identify the histological features of tonsils	
20. Describe the location and structure of spleen.	
21. Identify the histological features of spleen	

BIOCHEMISTRY

TOPICS & OBJECTIVES	LEARNING STRATEGY
Structure and Types of Hemoglobin	
1. Explain the structure and types of hemoglobin.	Interactive Lectures/Small Group Discussion
Oxygen Dissociation Curve	
2. Explain the biochemical basis of oxygen dissociation curve.	Interactive Lectures/SGD
Hemoglobin abnormalities-1	
3. Discuss the abnormalities of Hemoglobin synthesis, Porphyrias & its types.	Interactive Lectures/ SGD
Hemoglobin abnormalities-2	
4. Explain the biochemical aspects of Hemoglobinopathies (Thalassemia, Sickle Cell anemia)	Interactive Lectures/ SGD
Iron metabolism	
5. Discuss Iron metabolism in the body with its abnormalities.	Interactive Lectures/ SGD
Vitamin B12 & Folic acid	
6. Explain the biochemical importance of Vitamin B12 & folic acid and associated diseases.	Interactive Lectures/ SGD
Vitamins E & K	
7. Explain the importance of vitamin K & E with associated diseases.	Interactive Lectures/ SGD
Plasma Proteins	
8. Explain the Biochemical basis for the difference in plasma and serum	Interactive Lectures/ SGD
9. Explain the composition of plasma and plasma proteins.	
Immunoglobulins	
10. Define immunoglobulins	Interactive Lectures/ SGD
11. Describe their chemistry, structure and classification.	
Specimen collection	Practical
12. collect the blood specimen for biochemical analysis	
Spectrophotometer	
13. Demonstrate the use of spectrophotometer.	
Flame Photometer	
14. Demonstrate the use of Flame photometer	
Estimation of Plasma Proteins	
15. Discuss the role of plasma protein in disease and normal condition and use of electrophoresis for the detection of plasma proteins.	
Electrophoresis	
16. Demonstrate the electrophoresis and its application for the detection plasma proteins.	
ELISA	
17. Demonstrate the biochemical use of ELISA and its application in the detection of disease.	

PHYSIOLOGY

TOPICS & OBJECTIVES	LEARNING STRATEGY
Composition of blood & its cellular components	
1. Enumerate the functions of the cellular components of blood.	Interactive Lectures/Small Group Discussion
2. State the normal values of RBCs, WBCs & platelets.	
3. Define hematocrit, normal values & factors affecting hematocrit.	
Formation and development of RBCs (erythropoiesis)	
4. Discuss the different stages of RBCs formation	Interactive Lectures/ SGD
5. List factors necessary for erythropoiesis.	
6. Discuss the significance of Reticulocyte count	
7. Discuss the role of Erythropoietin.	
Classification of anemia and significance of red cell indices	
8. Describe the morphological & etiological classification of anemia	Interactive Lectures/ SGD
9. Discuss the significance of red cell indices and their normal values.	
Megaloblastic /iron, B12 folic def. anemia	
10. Discuss the etiology & microscopic picture of Megaloblastic and iron deficiency anemia	Interactive Lectures/ SGD
11. Differentiate between Megaloblastic & Pernicious Anemia based on microscopic picture and red cell indices.	
Hemolysis and hemolytic anemia (hereditary spherocytosis, GGPD def, sickle cell disease)	
Polycythemia.	
12. Define types of polycythemia	Interactive Lectures/ SGD
13. Explain the effects of polycythemia on human body	
Blood groups ABO/RH system	
14. Explain the ABO(classical) and Rh system of blood grouping & their inheritance pattern.	Interactive Lectures/ SGD
15. Define Agglutinogen, agglutinin & agglutination.	
16. List various Rh antigens & Rh immune response.	
17. Name the transfusion reactions associated with mismatched blood transfusion.	
Hemostasis & role of Thrombocytes	
18. Describe the events in Hemostasis	Interactive Lectures/ SGD
19. Explain the mechanism of formation of platelet plug .	
20. Describe the role of Prothrombin in blood coagulation and clot formation.	
Clotting cascade & bleeding disorders	
21. Explain intrinsic and extrinsic pathway for coagulation.	Interactive Lectures/ SGD
22. Enumerate the clotting factors	

23. Describe the role of clotting factors in coagulation.	
Hemorrhagic & thromboembolic conditions.	
24. Explain the following hemorrhagic and Thrombo-embolic conditions:	Interactive Lectures/ SGD
i. Hemophilia	
ii. Thrombocytopenia	
iii. Disseminated Intravascular Coagulation.	
25. Discuss the role of commonly used anticoagulants	
Fibrinolytic mechanisms.	
26. Explain the fibrinolytic mechanism and role of plasmin in lysis of blood clots.	Interactive Lectures/ SGD
27. Discuss the role of fibrin & anti-thrombin III in anticoagulation.	
Genesis and general characteristics of white blood cells.	
28. Describe the process of leukocyte genesis	Interactive Lectures/ SGD
29. List various types of granulocytes and agranulocytes, their functions & normal values.	
Functions of WBCs: Monocytes macrophage cell system.	
30. Explain the significance of Reticuloendothelial system in body defense mechanism	Interactive Lectures/ SGD
31. List various macrophages in different tissues of body.	
32. Discuss the role of passive immunity against infection.	
Types and functions of lymphocytes	
33. List the types of lymphocytes and their site of origin.	Interactive Lectures/ SGD
34. Discuss the functions of T and B lymphocytes.	
35. Enumerate types of T lymphocytes & their functions.	
Immunity: its types and Innate	
36. Define immunity	Interactive Lectures/ SGD
37. Classify immunity	
38. Describe the process of innate immunity	
Cell mediated Immunity	
39. Define cell mediated immunity	Interactive Lectures/ SGD
40. List the cells involved in this immunity type	
41. Describe the process of cell mediated immunity	
Humoral immunity	
42. Define Humoral immunity	Interactive Lectures/ SGD
43. List the cells involved in this immunity type	
44. Describe the process of humoral mediated immunity	
45. List the advantages of this immunity type	
Passive immunity and immunization	
46. Define passive immunity & immunization	Interactive Lectures/ SGD
47. Differentiate between passive and active immunity	
48. Describe the process of immunization and its advantages	
49. Explain the Expanded Program on Immunization (EPI)	

Allergy and hypersensitivity.	
50. Discuss the following types of hypersensitivity and allergic reactions:	Interactive Lectures/ SGD
i. Urticaria	
ii. Anaphylaxis	
iii. Hay fever	
51. Discuss the role of Ig E in Immunity.	
52. Demonstrate peripheral blood smear	Practical
53. Perform tests for A,B,O, & Rh blood grouping	
54. Perform tests of bleeding time and clotting time.	
55. DLC	
56. Determine Erythrocyte Sedimentation Rate	

LEARNING RESOURCES

SUBJECT	RESOURCES
ANATOMY	**A. GROSS ANATOMY** 1. K.L. Moore, Clinically Oriented Anatomy 2. Neuro Anatomy by Richard Snell 3. https://www.kenhub.com/en/dashboard **B. HISTOLOGY** 1. B. Young J. W. Health Wheather's Functional Histology **C. EMBRYOLOGY** 1. KeithL. 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
PHYSIOLOGY	**A. TEXTBOOKS** 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 **B. REFERENCE BOOKS** 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
PATHOLOGY/MICROBIOLOGY	**A. TEXT BOOKS** 1. Robbins & Cotran, Pathologic Basis of Disease, 9th edition. 2. Rapid Review Pathology, 4th edition by Edward F. Goljan MD 1. http://library.med.utah.edu/WebPath/webpath.html 2. http://www.pathologyatlas.ro/
PHARMACOLOGY	**A. TEXT BOOKS** 1. Lippincot Illustrated Pharmacology 2. Basic and Clinical Pharmacology by Katzung

OTHER LEARNING RESOURCES

Hands-on Activities/ Practical	Students will be involved in Practical sessions and hands-on activities that link with the blood module to enhance the learning.
Labs	Utilize the lab to relate the knowledge to the specimens and models available.
Skills Lab	A skills lab provides the simulated learning experience to learn the basic skills and procedures. This helps build the confidence to approach the patients.
Videos	Video familiarize the student with the procedures and protocols to assist patients.
Computer Lab/CDs/DVDs/Internet Resources:	To increase the knowledge, students should utilize the available internet resources and CDs/DVDs. This will be an additional advantage to increase learning.
Self Learning	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:

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

BCQs:

- A BCQ has a statement or clinical scenario of four options (likely answers).
- **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 LNHMC.

OSCE:

- All students rotate through the same series of stations in the same allocated time.
- At each station, a brief written statement includes the task. Student completes the given task at one given station in a specified time.
- Stations are observed, unobserved, interactive or rest stations.
- In unobserved stations, flowcharts, models, slide identification, lab reports, case scenarios may be used to cover knowledge component of the content.
- Observed station: Performance of skills /procedures is observed by assessor
- Interactive: Examiner/s ask questions related to the task within the time allocated.
- In Rest station, students in the given time not given any specific task but wait to move to the following station.

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, assignment, practicals and the internal exam which will all have specific marks allocation.

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

For JSMU Examination Policy, please consult JSMU website!

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

LNH&MC EXAMINATION RULES & REGULATIONS

- 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	MONTH
WEEK 1	FOUNDATION MODULE	3rd Feb 2020
WEEK 2		
WEEK 3		
WEEK 4		
WEEK 5		
WEEK 6		13th March 2020
WEEK 1	BLOOD MODULE	March 2020
WEEK 2		
WEEK 3		
WEEK 4		2020

*Final dates will be announced later