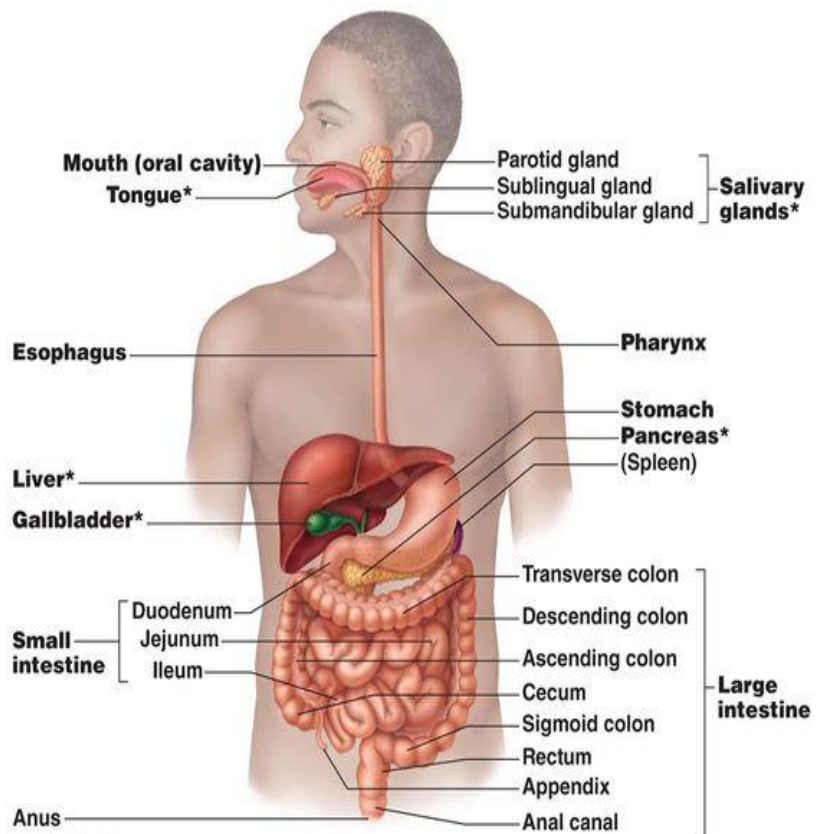
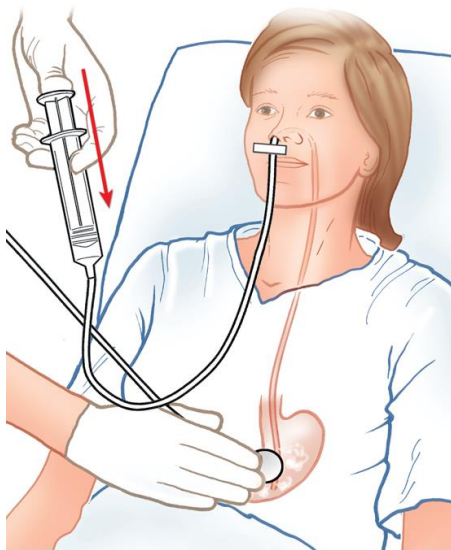
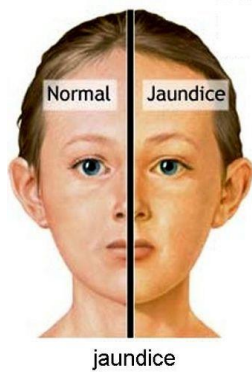
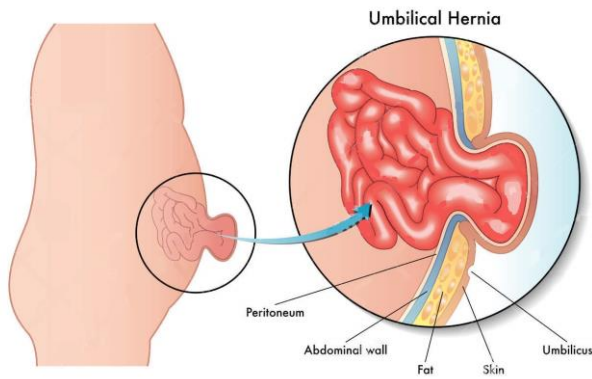


STUDY GUIDE

GASTROINTESTINAL TRACT & LIVER MODULE-I

FIRST YEAR MBBS

21st Aug – 14th Sep 2019



**LIAQUAT NATIONAL HOSPITAL
& MEDICAL COLLEGE**



STUDY GUIDE FOR GASTROINTESTINAL TRACT & LIVER MODULE-I

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Module name: Gastro-Intestinal Tract (GIT) & Liver-I

Year: **One**

Duration: **4 weeks (Aug -Sep 2019)**

Timetable hours: **Interactive Lectures, Tutorials, Case-Based Learning (CBL), Self-Study, Practicals, Skills, Demonstrations**

MODULE INTEGRATED COMMITTEE

MODULE COORDINATOR:	<ul style="list-style-type: none"> • Prof. Nazir Solangi (Pharmacology)
CO-COORDINATORS:	<ul style="list-style-type: none"> • Dr. Aneeta Khoso (Community Medicine) • Dr. Afifa Tabassum (DHCE)

DEPARTMENTS' & RESOURCE PERSONS' FACILITATING LEARNING

BASIC HEALTH SCIENCES	CLINICAL AND ANCILLARY DEPARTMENTS
ANATOMY <ul style="list-style-type: none"> • Professor Zia-ul-Islam 	RESEARCH & SKILLS DEVELOPMENT CENTER <ul style="list-style-type: none"> • Dr. Kahkashan Tahir
BIOCHEMISTRY <ul style="list-style-type: none"> • Dr. Kashif Nisar 	
PHYSIOLOGY <ul style="list-style-type: none"> • Professor Syed Hafeezul Hassan 	
DEPARTMENT of HEALTH CARE EDUCATION	
Professor Nighat Huda	Dr. Sobia Ali
Dr. Mehnaz Umair	Dr. Afifa Tabassum
	Dr. Muhammad Suleman
LNH&MC MANAGEMENT	
Professor Karimullah Makki, Principal LNH&MC	
Dr. Shaheena Akbani, Director A.A & R.T LNH&MC	
STUDY GUIDE COMPILED BY: Dr. Afifa Tabassum, Department of Health Care 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 Interactive 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.

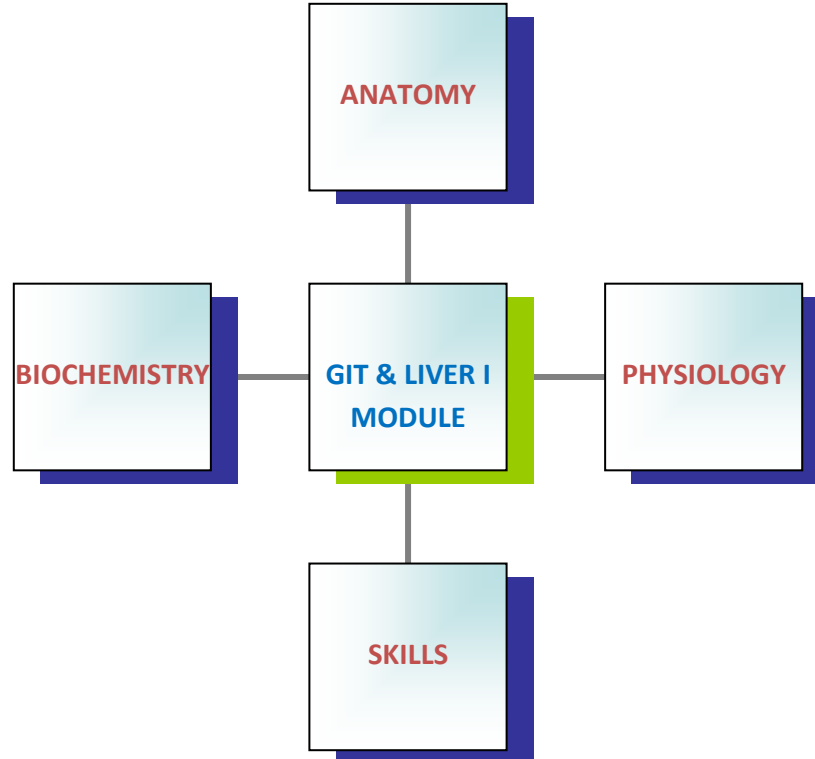
CURRICULUM FRAMEWORK

Students will experience *integrated curriculum* at LNMC in accordance with the JSMU guidelines and most recent developments that have an impact on individual health.

INTEGRATED CURRICULUM comprises of system-based modules 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 GASTROINTESTINAL TRACT (GIT) & LIVER 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
- Self-study

INTERACTIVE LECTURES

In large group, the Interactive 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.

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, or discussion topics. Students exchange opinions and apply knowledge gained from Interactive 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 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: GIT & LIVER I**INTRODUCTION**

In this module, medical students will learn in detail the normal structure, function and diseases GI Tract and hepatobiliary system. From Pakistan's context, the prevalence and significance of GIT and liver illnesses can be judged from the total days that adults and children are affected and remain absent from schools or work; number of admissions to hospitals ; and in numbers of surgical procedures performed.

Children and adults present to general practice, or hospitals with signs and symptoms of some of very common illnesses related to GIT & Liver including vomiting, chronic diarrhea, constipation, peptic ulcers, enteric fever, malnutrition, jaundice etc. This module will provide students opportunities to understand the basis of these illnesses including the mechanism involved in the development of these pathologies and integrate basic medical science knowledge to clinical problem-solving.

Students will identify how GI structure (Embryology, Microscopic Anatomy and Gross Anatomy) integrates with function (physiologic mechanisms of GI motility, digestion and absorption, and liver and pancreatic function). Therefore, the overall objective of this course is to provide an integrative understanding of the structure and functions of the gastrointestinal tract.

COURSE OBJECTIVES AND STRATEGIES

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

TOPICS & OBJECTIVES	FACULTY	LEARNING STRATEGIES
1. Introduction of GIT		
a) Discuss the abdominal quadrants with their contents and surface landmarks of the abdomen	Anatomy	Tutorial
b) Discuss the characteristics of gastrointestinal wall c) Explain functional types of movements in GIT d) Describe gastrointestinal blood flow briefly	Physiology	Interactive Lecture/ Tutorial
2. Functions of the smooth muscle and their electrical properties		
e) List the electrical properties of smooth muscle f) Explain the mechanism of smooth muscle contraction g) Differentiate smooth muscle from skeletal muscle h) Describe genesis of BER and its role in GI motility	Physiology	Interactive Lecture/ Tutorial
3. Control of GIT		
a) Describe autonomic nervous system b) Explain Myenteric and Meissner's plexus c) List GIT hormones and their role in digestive process d) Describe GIT reflexes	Physiology	Interactive Lecture
4. Mastication and salivary secretions		
a) Describe the mastication reflex b) Describe phases of deglutition c) Explain lower esophageal tone and motility disorders	Physiology	Interactive Lecture
d) List the salivary glands e) Discuss regulation of secretion of saliva (stimuli and control)		
f) Discuss the salivary composition and functions		
5. Development of foregut, midgut and hindgut & congenital anomalies		
a) Explain the process of development of GIT and divisions of primitive gut b) Describe the derivatives of foregut, midgut & hindgut c) Describe the development of : i. Esophagus ii. Stomach iii. Lesser & greater sac iv. Small and large intestine d) Discuss the common congenital anomalies involving foregut:	Anatomy	Interactive Lectures

<ul style="list-style-type: none"> i. cleft lip/palate ii. esophageal atresia/stenosis ii. congenital hypertrophic pyloric stenosis iii. duodenal atresia/ stenosis iv. accessory spleen e) Discuss the common congenital anomalies involving midgut & hindgut <ul style="list-style-type: none"> i. congenital omphalocele ii. Gastroschisis iii. umbilical hernia iv. intestinal atresia/stenosis v. malrotation of gut vi. ileal diverticulum vii. intestinal duplication viii. Hirschsprung's disease ix. rectal atresia x. imperforate anus and anal stenosis f) Describe the development of liver, biliary apparatus & pancreas and their congenital anomalies <ul style="list-style-type: none"> i. extrahepatic biliary atresia ii. annular pancreas iii. accessory pancreatic tissue g) Discuss the molecular regulation of Liver & Pancreas development 		
6. Peritoneal cavity		
<ul style="list-style-type: none"> a) Explain the layers, folds, recesses and compartments of peritoneum with their clinical importance b) Discuss the extent of peritoneum, peritoneal cavity and reflections c) Explain the boundaries of greater & lesser sac 	Anatomy	Interactive Lecture
7. Esophagus and Stomach		
<ul style="list-style-type: none"> a) Demonstrate the microscopic features of esophagus and stomach b) Explain the gross anatomy of abdominal esophagus with its peritoneal & visceral relations, neurovascular supply, lymphatic drainage and clinical importance 	Anatomy	Interactive Lecture/Practical
<ul style="list-style-type: none"> c) Explain the gross anatomy of stomach with its peritoneal & visceral relations, neurovascular supply, lymphatic drainage and clinical importance 		Interactive Lecture
<ul style="list-style-type: none"> d) Describe motor functions of stomach e) Explain regulation of stomach emptying f) Describe the composition, function and regulation of gastric secretions 	Physiology	Interactive Lecture

8. Pancreas		
a) Explain the gross anatomical features of pancreas with its neurovascular supply, peritoneal relations and clinical importance	Anatomy	Interactive Lecture
b) Demonstrate the microscopic features of pancreas		Practical
c) Discuss the composition, function and regulation of pancreatic secretion	Physiology	Interactive Lecture/ Tutorial
9. Small and large intestine		
a) Demonstrate the microscopic features of small intestine and large intestine	Anatomy	Practical
b) Differentiate between the parts of small and large intestine on the basis of anatomical features with neurovascular supply and lymphatic drainage		Interactive Lecture
c) List the clinical conditions related to small & large intestine like volvulus and intussusception		
d) Discuss the clinical importance of appendix and its neurovascular supply		
d) List different enzymes secretions of small and large intestine	Physiology	Interactive Lecture/ Tutorial
e) Describe regulation of different enzymes secretions of small and large intestine		
f) Describe segmentation, peristalsis, mass movement and defecation reflex		
g) Describe effects of autonomic system in modulating intestinal motility		
h) Explain vomiting reflex and its causes		Tutorial
10. Rectum & anal canal		
a) Demonstrate the microscopic features of rectum and anal canal	Anatomy	Practical
b) Discuss the structure, neurovascular supply and clinical importance of rectum		Interactive Lecture
c) Discuss the structure, neurovascular supply and clinical importance of anorectal junction and anal canal		
d) Discuss the defecation reflex and its regulation	Physiology	Interactive Lecture
11. Liver & Hepatic portal system		
<ul style="list-style-type: none"> • Demonstrate the microscopic features of liver parenchyma with general concepts of hepatic lobule, portal lobule and hepatic acinus • Explain the histological features of exocrine part of pancreas 	Anatomy	Practical

<ul style="list-style-type: none"> Describe the gross features, neurovascular supply and clinical correlation of liver, gall bladder and extra-hepatic biliary apparatus 		Interactive Lecture
<ul style="list-style-type: none"> Explain the venous drainage of organs of GIT, hepatic portal system, its tributaries and sites of porto-systemic anastomosis with its clinical importance 		Interactive Lecture
12. Gall bladder and biliary tract		
a) Describe the gross features, neurovascular supply and clinical importance of gall bladder and extra-hepatic biliary apparatus	Anatomy	Interactive Lecture
b) Discuss the microscopic features of gall bladder		Practical
c) Describe composition of bile and its regulation d) Explain conjugation and secretion of bile salts e) Explain role of bile acids in fats emulsification f) Describe enterohepatic circulation of bile salts	Physiology	Interactive Lecture/ Tutorial
13. Anterior and posterior abdominal wall		
a) Describe the fascia, muscles and neurovascular supply of anterior and posterior abdominal wall	Anatomy	Interactive Lecture
b) Explain formation of rectus sheath with its contents		
c) Discuss the features of lumbar vertebrae		Interactive Lecture
d) Discuss the anatomical features and clinical importance of inguinal canal		Interactive Lecture /Tutorial
e) Differentiate between different types of abdominal and inguinal hernia		Interactive Lecture/ Tutorial
14. Blood supply, nerve supply, lymphatics and surface anatomy of abdomen		
a) Describe the paired and unpaired branches of abdominal aorta and their supply	Anatomy	Interactive Lecture
b) Discuss the formation, extent, course and tributaries of Inferior vena cava		
c) Explain the relations of inferior vena cava		
d) Discuss the clinical conditions associated with inferior vena cava		
e) List the branches of lumbosacral plexus supplying abdominal wall		
f) Discuss lymphatic drainage and nerves of abdomen, formation of cisterna chyli and thoracic duct		
g) Identify and palpate the bony landmarks of the abdomen	Anatomy	Practical
h) Discuss the nine abdominal regions and quadrants and list the abdominal organs which are lying in each quadrant		

<ul style="list-style-type: none"> i) Discuss the surface anatomy of stomach and spleen in relation to anterior abdominal wall j) Discuss the surface anatomy of kidneys, ureters and spleen in relation to posterior abdominal wall. k) Identify the surface anatomy of liver l) Discuss the surface anatomy of diaphragm m) Identify the level of vertebrae with respect to the three major orifices in the diaphragm 		
16. Digestion & Absorption of Carbohydrates		
a) Describe dietary carbohydrates and their action	Biochemistry	Interactive Lecture
b) Explain the significance of the glycemic index		
c) Describe the importance of dietary fibers		
d) List the main digestive enzymes and describe their action on carbohydrate		
e) Discuss the abnormalities due to digestive enzyme deficiency		
f) Explain the absorption of monosaccharides by the intestinal mucosal cells		
g) Explain the significance of lactose intolerance		
h) Perform serum glucose estimation (kit method)		Practical
17. Digestion & Absorption of Proteins		
a) List the various sources of dietary protein	Biochemistry	Tutorial
b) Discuss the digestion of protein in the stomach and intestine		
c) List and explain the function of the proteolytic enzymes		
d) Explain the mechanism of absorption of amino acids		
e) Discuss the biomedical importance of protein allergy, celiac sprue and cystinuria		
f) Discuss the significance of amino acid pool		
g) Explain the significance of nitrogen balance.		
18. Digestion & Absorption of Lipid		
a) List the constituents of dietary lipids	Biochemistry	Tutorial
b) List causes of steatorrhea		
c) Discuss the digestion of lipid in the stomach and small intestine		
d) Explain the role of lipases in lipid digestion		
e) Discuss the digestion of dietary cholesterol and phospholipid		

f) Explain the hormonal regulation of lipid digestion		
g) Discuss the absorption of lipid by the intestinal mucosal cells		
h) Discuss the resynthesize and secretion of lipid by the enterocytes		
i) Discuss the secretion of chylomicron by the enterocytes		
j) Discuss the abnormalities of lipid digestion and absorption with especial reference to cystic fibrosis		
k) Explain steatorrhea		
19. Glycolytic Pathway of Carbohydrates Metabolism		
a) Differentiate between aerobic and anaerobic glycolysis	Biochemistry	Interactive Lecture
b) Explain the role of insulin in transport of glucose inside the cells		
c) List the reactions of the two stages of glycolysis <ul style="list-style-type: none"> o Energy investment and o Energy generation 		
d) Explain the hormonal regulation of glycolysis		
e) Discuss the fate of pyruvate		
f) Explain the process of glycolysis in RBC's		
20. TCA Cycle of Carbohydrates Metabolism		
a) Discuss the significance of TCA cycle as an amphibolic pathways	Biochemistry	Interactive Lecture
b) Discuss the reactions of the TCA cycle and its regulatory steps		
c) Describe the energy produced from TCA cycle		
d) Explain the disorder of TCA cycle with special reference to PDH deficiency		
21. Metabolism of Glycogen with Its Disorders		
a) Explain the structure and function of glycogen	Biochemistry	Interactive Lecture
b) Describe the mechanism of glycogen synthesis and its regulation		
c) Describe the mechanism of glycogenolysis and its regulation		
d) Discuss the maintenance of blood glucose level		
e) Explain the various form of glycogen storage diseases		
f)		

22. Metabolic Pathway of Gluconeogenesis		
a) Describe the mechanism of gluconeogenesis	Biochemistry	Interactive Lecture Interactive Lecture/ Tutorial
b) List the reactions which are unique to gluconeogenesis		
c) Explain the mechanism of transport of oxaloacetic acid to the cytosol		
d) Describe how gluconeogenesis is along with their regulatory enzymes		
e) Explain the Cori cycle		
23. Metabolic Pathway of HMP Shunt		
a) Describe the significance of hexose monophosphate shunt	Biochemistry	Interactive Lecture
b) Describe the oxidative and non-oxidative stages of HMP shunt		
c) Discuss the enzymes of the HMP shunt and its regulation.		
d) Explain the abnormalities of the HMP shunt especially G6PD.		
e) Discuss the significance of reactive oxygen species		
f) Discuss the functions of NADPH and glutathione		
24. Metabolic Pathway of Fructose & Galactose		
a) List the sources of fructose	Biochemistry	Interactive Lecture
b) Discuss the alternative mechanism of monosaccharide metabolism		
c) Discuss the important enzymes of fructose metabolism		
d) Explain the metabolic pathway of fructose		
e) Explain the disorders occur in fructose metabolism due to enzyme deficiencies		
f) Discuss the important enzymes of in Galactose metabolism		
g) Explain the metabolic pathway of Galactose metabolism		
h) Explain the disorders occur in Galactose metabolism due to enzyme deficiencies		
i) Describe the importance of uronic acid pathway in liver detoxification		

25. Bioenergetics & Biological Oxidation		
a) List high energy and low energy phosphate	Biochemistry	Interactive Lecture
b) List the oxido-reductase enzyme		
c) Define bioenergetics and explain the general laws of thermodynamics		
d) Define free energy and equilibrium constant		
e) Describe the coupling of endergonic and exergonic reactions by high energy intermediate (e.g. ATP)		
f) Describe the role of ATP as a energy carrier		
g) Describe biologic oxidation and redox potential		
26. Oxidative Phosphorylation & Electron Transport Chain		
a) List the ion transporters in the inner mitochondrial membranes	Biochemistry	Interactive Lecture/ Tutorial
b) List the genetic defects of oxidative phosphorylation		
c) Explain the energy currency of the body		
d) Explain the site and mechanism of synthesis of ATP		
e) Describe the organization of the electron transport chain		
f) Discuss the functions of each complex of ETC		
g) Describe how proton are pumped from the matrix to the intermembrane space		
h) Discuss the significance of co-enzyme Q and the Q-cycle		
i) Discuss the inhibitors and uncouplers of ETC and their mechanism of action		
j) Discuss how electron transport chain releases free energy		
k) Discuss the generation of proton gradient		
l) Explain the significance of P.O. Ratio		
m) Explain Mitchell's chemiosmosis theory of electrochemical gradient		
n) Explain the glycerophosphate and malate shuttle		
27. Metabolic Role of Liver & Its Detoxification		
a) List the liver function tests based on the five main functions of the liver	Biochemistry	Interactive Lecture
b) Discuss the metabolic, synthetic, excretory, detoxification and storage functions of liver		

c) Explain the normal level of serum bilirubin (total, conjugated and unconjugated), urinary urobilinogen, urinary bilirubin, fecal stercobilinogen in different types of Jaundice		
d) Discuss the importance of serum enzyme in the differential diagnosis of Jaundice (ALT, AST, ALP, LDH, GGT, and 5'-Nucleotidase)		
e) Discuss the importance of albumin, total protein and prothrombin time in diagnosing liver disease		
28. Degradation of Hemoglobin and Bilirubin Metabolism		
a) List the steps of heme degradation to bilirubin	Biochemistry	Interactive Lecture
b) Discuss the role of liver in bilirubin uptake and conjugation		
c) Discuss the secretion of bilirubin in bile		
d) Explain the fate of bilirubin in the intestine and its excretion in urine and stool		
29. Jaundice and its biochemical investigations		
a) Describe the disorders of bilirubin metabolism	Biochemistry	Interactive Lecture
b) Explain the types of bilirubin in the blood		
c) Discuss jaundice		
d) Explain the causes and diagnostic investigations of pre-hepatic Jaundice		
e) Explain the causes and diagnostic investigations of hepatocellular Jaundice		
f) Explain the causes and diagnostic investigations of post-hepatic and obstructive Jaundice		
g) Estimate & Interpret Serum Bilirubin Level		Practicals
h) Estimate & Interpret Serum ALT Level		
i) Discuss the Clinical significance of LFTs		
30. Skills		
j) Perform NG intubation	Skills lab	Hands-on session

LEARNING RESOURCES

SUBJECT	RESOURCES
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

Hands-on Activities/ Practical	Students will be involved in Practical sessions and hands-on activities that link with the GIT & Liver-I 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 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:**Theory:**

- **Best Choice Questions (BCQs)** also known as MCQs (Multiple Choice Questions) are used to assess objectives covered in each module.
 - A BCQ has a statement or clinical scenario followed by four options (likely answer).
 - Students after reading the statement/scenario select ONE, the most appropriate 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/OMR sheet designed for LNHMC.

OSPE/OSCE: Objective Structured Practical/Clinical Examination:

- Each student will be assessed on the same content and have same time to complete the task.
- Comprise of 12-25 stations.
- Each station may assess a variety of clinical tasks, these tasks may include history taking, physical examination, skills and application of skills and knowledge
- Stations are observed, unobserved, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Unobserved will be static stations in which there may be an X-ray, Labs reports, pictures, clinical scenarios with related questions for students to answer.
- Rest station is a station where there is no task given and in this time student can organize his/her thoughts.

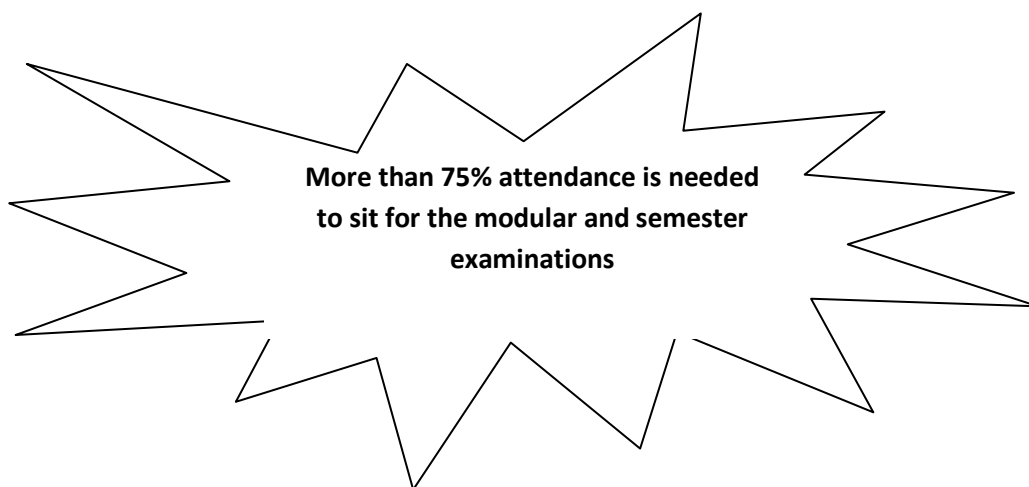
Internal Evaluation

- 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 Final Examination.

Example : Number of Marks allocated for Final Theory and Internal Evaluation			
Semester	Final Examination Theory Marks	Internal Evaluation (Class test + 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



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 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.

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

- A candidate obtaining GPA less than 2.00 (50%) is declared un-graded (fail).
- Cumulative transcript is issued at the end of clearance of **all** modules.

SCHEDULE:

WEEKS	1 ST YEAR	MONTH
WEEK 1	FOUNDATION MODULE	9 th Feb 2019
WEEK 2		26 th March 2019
WEEK 3		
WEEK 4		
WEEK 5		
WEEK 6		
	MODULAR EXAM	28 th & 29 th March
WEEK 1	BLOOD MODULE	1 st April 2019
WEEK 2		27 th April 2019
WEEK 3		
WEEK 4		
	MODULAR EXAM	29 th & 30 th April 2019
WEEK 1	LOCOMOTOR MODULE	2 nd May 2019
WEEK 2		29 th June 2019
WEEK 3		
WEEK 4		
WEEK 5		
WEEK 6		
WEEK 7		
WEEK 8		
	MODULAR EXAM	1 st & 2 nd July 2019
WEEK 1	RESPIRATORY MODULE - I	3 rd July 2019
WEEK 2		27 th July 2019
WEEK 3		
WEEK 4		
WEEK 1	CVS MODULE - I	24 th July 2019
WEEK 2		17 th Aug 2019
WEEK 3		
WEEK 4		
	MODULAR EXAM (Respiratory-I & CVS-I)	19 th & 20 th Aug 2019*
WEEK 1	GIT & LIVER MODULE - I	21 st Aug 2019
WEEK 2		14 th Sep 2019
WEEK 3		
WEEK 4		
	MODULAR EXAM	17 th & 18 th Sep 2019*

*Final dates will be announced later