



STUDY GUIDE
1st YEAR MBBS
Y1 B3

DEPARTMENT OF MEDICAL EDUCATION

CMH KHARIAN MEDICAL COLLEGE



Table of Contents

Mission & Vision	1
Exit Outcomes of CKMC.....	1
Introduction to Study Guides.....	3
Curriculum Integration	4
Teaching and learning methods	5
Small group discussion.....	5
Problem Based Learning.....	5
Large Group Interactive Session	6
Self-Directed Learning	7
Hands on Training	7
Assessment Format.....	9
Assessment Types	9
Annual Professional Examination	10
Structures summery Y1B1.....	11
Block Development Committee.....	11
Learning Outcomes.....	12
Course Content.....	15
Anatomy.....	15
List of Practical.....	34
List of CBL's.....	34
Table of specification Anatomy.....	37
Content Physiology.....	41
List of Physiology practical's.....	47
List of Physiology CBL's.....	47
Table of specification Physiology.....	52
Content Bio chemistry.....	54

Table of specification Bio Chemistry.....	57
Content Medicine.....	59
Content Surgery.....	62
Research Methodology.....	63
Learning resources	65



MISSION

Our mission is to educate and produce exemplary doctors who practice ethical patient centered health care, discover and advance knowledge and are responsive to the community needs.

VISION

To produce competent doctors equipped with sound knowledge based on scientific principles, imbued with ethics and moral values primed to serve the community through the profession.

Our aim is to

- Provide outstanding educational environment for medical students.
- Develop exemplary clinicians who are lifelong learners and provide the highest quality compassionate care and serve the needs of their community and thenation in the best traditions of medical profession.
- Ensure the highest ethical and professional standards in all of our deeds.

Exit Outcomes for the CKMC Graduate

At the end of five years MBBS degree program graduate of CMH Kharian Medical College should be able to:

Knowledge

- Integrate knowledge of basic and clinical sciences in health promotion and disease prevention.
- Able to appraise varied information they would come across during professional work and testify innovative ideas to benefit human society through evidence-based health care practice
- Demonstrate scientific knowledge in all professional activities
- Demonstrate research skills which bring innovation and significance to health care practices.

Skills

- Independently manage non critical clinical problems.
- Demonstrate competency in life saving procedures.
- Exhibit propensity of lifelong learner

Attitude

- Manifest ethical values and professionalism.
- Demonstrate communication skills, interprofessional skills and leadership.

knowledge	Skill	Attitude
Integrated knowledge of basic & clinical sciences	Communication skills	Ethical values
Patient centered care	Research skills	
Health promotion & disease prevention	Patient management skills	Professionalism
Community needs	Leadership skills	
	Critical thinking skills	

Introduction to the Study Guide

Dear Students,

We, at the Department of Medical Education, CMH Kharian Medical College, have developed this study guide especially for you. This study guide is an aid to

- Inform you how this part of your syllabus has been organized.
- Inform you how your learning programs have been organized in this block.
- Help you organize and manage your studies throughout the block
- Guide you on assessment methods, rules and regulations.
- Communicate information on organization and management of the block. This will help you to contact the right person in case of any difficulty.
- Define the objectives which are expected to be achieved at the end of the block.
- Identify the learning strategies such as lectures, small group discussions, clinical skills, demonstration, tutorial and case-based learning that will be implemented to achieve the block objectives.
- Provide a list of learning resources such as books, and journals for students to consult in order to maximize their learning.

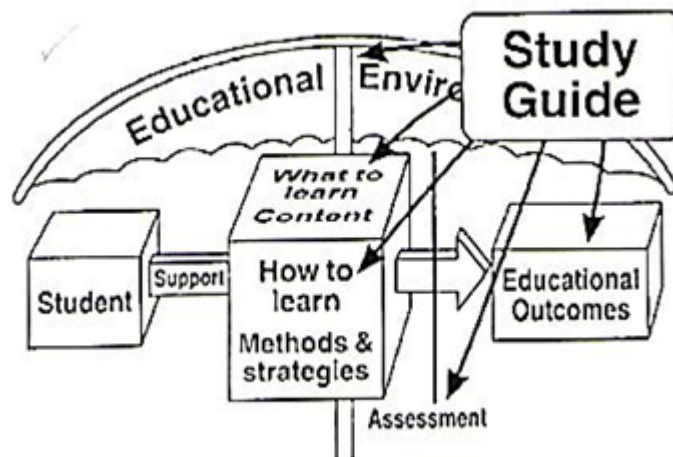


Figure 1 Objectives of study guide by Harden

Curriculum Integration



Integrated modular system based spiral curriculum is followed that promotes acquisition of skills along with the knowledge and that breaks the boundaries between basic and clinical sciences.

In spiral curriculum, new learning has relationship with old learning, and it goes in logical pattern from simpler to complex topics. Students are encouraged to apply previous knowledge in later phases, and this is there as on students perform well (Jhonston,2012).

The change from the traditional curriculum is must because in this type of curriculum students are unable to understand the wider context of what they are learning as they do not understand how one subject impacts the other.

Teaching and Learning Methods

1: Small Group Discussions (SGD)

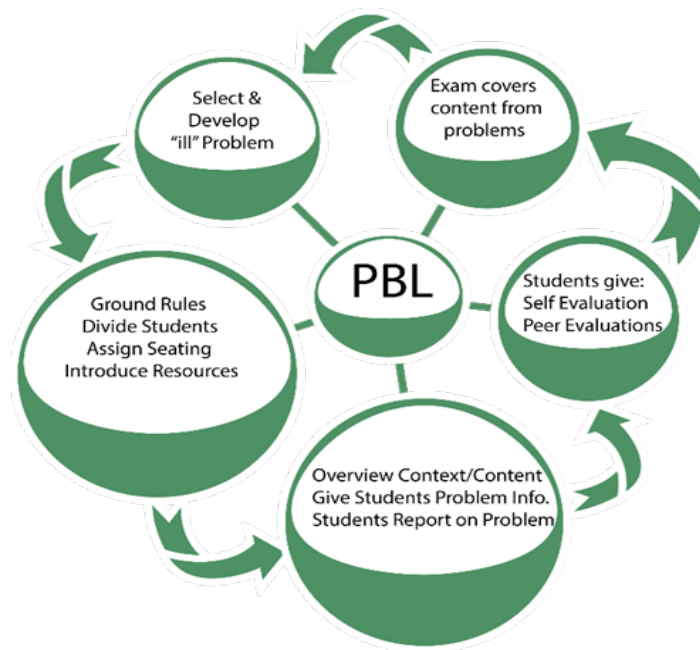


The topic will be taught in groups with the help of models and audiovisual aids. Pre-planned topics would help students to combine their wisdom in achieve learning objectives. Facilitator would be guiding to achieve learning objectives and making them on right track by clarify any misconception.

“Small group learning provides more active learning, better retention, higher satisfaction, and facilitates development of problem-solving and team-working abilities (Jahan, Siddiqui, AlKhouri, Ahuja, & AlWard, 2016).

2: Problem Based Learning (PBL)

This is group learning comprising of 8-10 students guided by a facilitator. For a specific problem given to students two sessions of 2 hours would be scheduled to achieve the learning objectives. In the first session students will discuss problem based upon their existing knowledge among the group and will produce a list of their learning objectives for further study. In the second session students share, discuss with each other to build new knowledge.



PBL is a self-directed learning and that type of educational strategy most likely produce doctors who are prepared for lifelong learning and able to meet the changing needs of their patients (Spencer & Jordan, 1999).

3: Large Group Interactive Session (LGIS)



These are meant to give overview of certain course content. They should be interactive so that students can not only gain knowledge but should completely understand it. Students may clarify the difficult concepts in these sessions. The lecturer introduces a

topic and explains the underlying phenomena through questions, pictures, videos of patient's interviews, exercises, etc. Students are actively involved in the learning process.

4: Self Directed Learning (SDL)



In this modern era of medical education, students assume responsibilities of their own learning according to the principles of adult learning. They can study independently, can share and discuss with peers, can take information from the sources of information college have like library, internet and teachers. Students will be provided time within the scheduled college hours for self-study.

5: Hands on Training

- **Lab session**



Histology, biochemistry, physiology practical will build skills in identification of

normal histology of human body tissues. There would be test of these skills in OSPE exam.

- **Clinical Rotations**



The students will rotate in the clinical departments to see integration of knowledge into clinical practices.

Teaching and learning activities are meant to help students to gain new knowledge. It should be kept in mind that they are not meant to fully cover the objectives of the subject. It is therefore responsibility of students to attain more information to cover all objectives given in the overall objectives.

Class attendance and participation is ofut most importance in gaining knowledge. If any help is needed module team can be contacted without any hesitation. Attendance will be strictly checked in different teaching activities. If attendance is **less than 75%**, students would not be allowed to sit for the examination.

Attendance in the examination is must and no students would be allowed to enter the examination area after starting the examination. In case of sickness, sick leaves from government/private hospitals or the emergency of the college hospital will only be entertained.

Assessment Format

Assessment is a goal-oriented process (Angelo, 1995). We assess in order to check whether the learning objectives set at the initiation of the program are met or not and to what extent (Amin, 2007).

No student will be allowed to sit in the annual examination if attendance is below 75% in theory and practical separately.

Assessment types

The assessment will be continuous. The purpose of continuous assessment is formative and summative.

Summative Assessment:

The marks of this type of assessment contribute in the final university result through internal assessment. It comprises:

- CBL/tutorial assessment
- Scheduled tests
- Sub-stages
- End of block exam
- Pre-annual exam

Scheduled tests and sub-stages will be conducted intermittently throughout the block. Their schedule will be intimated through the time tables.

The end of the block exam will be conducted after 8 weeks of instruction. It will comprise one theory paper and one practical exam for Anatomy, Physiology and Biochemistry. (Table of specifications (TOS) for exam has been provided)

Formative Assessment: Tests may be quizzes, surprise tests/written assignments/self-reflection by students during the teaching time but their marks will not be added to internal evaluation marks. The purpose of formative assessment is to provide feedback to the students, for the purpose of improvement and to teachers to identify areas where students need further guidance.

Internal Assessment

(Will be submitted to the university before professional exam)

- The weightage of internal assessment shall be 10 % in theory paper and 10 % in practical, in the annual professional examination (or 10 marks for 100 marks in theory and practical each)
- Scheduled tests, sub-stages, CBLs/tutorials, block examinations and pre-annual examinations, conducted by the college shall contribute towards internal assessment for professional examination.

Annual Professional Examination:

- The professional examinations schedule will be provided by NUMS.
- There will be two components of the final result
 - (i) Examination-80 %
 - (ii) Internal Assessment- 20 %
- There will be one theory paper and one Practical exam for Anatomy, Physiology and Biochemistry each. For practical the class will be divided into batches. Each batch will have practical exam of one subject on the specified day, according to schedule.
- Theory & Practical assessment shall be of 100 marks each in Anatomy, Physiology and Biochemistry, making a **total of 200 marks for each subject.**
- The Annual Theory paper shall be of 80 marks. 20 marks of internal assessment of theory papers, conducted throughout the year will be added to it, to make annual theory assessment of 100 marks.
Similarly, the annual practical examination will be of 80 marks. 20 marks of internal evaluation of practical exams, conducted throughout the year will be added to it, to make annual practical assessment of 100 marks.
- The pass score shall be 50 out of 100, in theory and practical separately.

Schedule of examinations:

a) Continuous assessments schedule

Schedule provided by each department in Time table.

b) Formative tests: Throughout the block

Block Development Committee

Chairperson curriculum committee	Principal Brig (Retd) Shoaib Nayyar Hashmi
Director Medical education	Dr Aasma Qaiser
Block Planner	Dr Aasma Qaiser
Resource Persons	Anatomy: Dr Aneeqa Physiology: Dr Aiman Farogh Anjum Biochemistry: Dr Zeeshan Medicine: Maj. Usman Surgery: Dr Waqas
Study Guide Developed By	Department of Medical Education CMH Kharian Medical College Kharian

Structured Summery of Y1B3

Block Code	Y1B3
Pre requisite Block	Y1B2
Duration	8 weeks
Anatomy	General anatomy, General embryology, General histology, Gross anatomy of upper limb
Physiology	Cell and Genetics, Nerve and Muscle and blood
Biochemistry	Cell, Chemistry of Proteins, Enzymes & hemoglobin
Surgery	Cell, breast cancer, fracture of upper limb, imaging techniques, imaging of upper limb
Medicine	Anemias, Bleeding disorders and Transfusion reaction
BSP	Communication skills, professionalism, leadership and management, ethics



Learning Outcomes

Knowledge

- Acquire the basic science knowledge and terminology necessary to understand the normal structure and function of human body from biochemical to organ system level, as well as the concepts of diseases in the community, drug dynamics.
- Identify different anatomical planes and correlate the importance of these with clinical medicine.
- Explain the structure & development of MS.
- Explain the physiological anatomy, biochemistry affecting the functions of MS.
- Apply the knowledge of the basic sciences to understand pathophysiology of common fractures.
- Understand the constituents and functions of human blood
- Describe development of blood cell from stem cell.
- Describe the process of development of RBC, WBC and Platelets.
- Discuss the. Process of immunity.
- Describe the sequence of events involved in homeostasis

	<ul style="list-style-type: none"> • Understand the physiology of conductive system of heart, cardiac cycle • Explain different waves, segment and intervals of ECG and apply it to the interpretation of ECG • Understand the pathophysiology of edema, infarction, shock and thrombosis • Demonstrate effective communication skill strategies while history taking and examining the patients with CVS problems. • Describe the gross anatomy of mediastinum along with clear understanding of structures present in it. • Correlate between histological structure of respiratory membrane and its role in diffusion of gases. • Integrate the basic science knowledge with clinical sciences in order to describe the pathogenesis, clinical presentations of common respiratory disorders, e.g., COPD
<p style="text-align: center;">Skill</p>	<ul style="list-style-type: none"> • Dissect limbs to demonstrate their gross Anatomy and relationship to each other. • Identify histological features of parts of MS under microscope • Perform the steps to determine the normal RBC count and ESR • Identify the type of lymphoid tissue under microscope • Demonstrate the differences between live attenuated vaccine and toxoids • Perform, the steps to identify ABO and Rh typing

Attitude

- Demonstrate the effective attitude towards the colleagues
- Demonstrate a professional attitude, team building spirit and good communication skills

COURSE CONTENT

FIRST YEAR MBBS

Block II CODE Y1B2

In case of online classes MIT and Assessment will be online via zoom meeting and

Google classroom

Anatomy

S.NO	theme / topic	Learning Outcomes	Learning Objectives	MIT	Assessment Tools
1	Histology of respiratory system	<ul style="list-style-type: none">Recognize the normal histomorphology of different parts of trachea-bronchial treeApply the knowledge of histological structure of trachea-bronchial tree in different clinical scenarios	<ul style="list-style-type: none">Enumerate cells comprising respiratory epitheliumElucidate the light microscopic structure of different components of respiratory tract (conducting and respiratory portion)Explain the progressive modification of wall of respiratory tract from trachea down to alveoliDescribe the components of respiratory membrane and role of type II of alveolar cells in surfactant production and respiratory distress syndrome.Appraise the histological basis	LGIS, Practical	MCQ's SEQ's SAQ's OSPE VIVA VOCE

			<p>of immotile cilia syndrome</p> <ul style="list-style-type: none"> • Identify the role of interalveolar septa in preventing alveolar collapse • Describe the histological basis of hemoptysis in cardiac failure <p>Skill</p> <ul style="list-style-type: none"> • Identify and illustrate histological structure of different parts of tracheobronchial tree (trachea and lungs) • Give two points of identification of each side 		
--	--	--	---	--	--

2	Development of respiratory system	Correlate the development of respiratory system with common congenital anomalies	<ul style="list-style-type: none"> • Describe the development of trachea • Comprehend the embryological basis of various types of tracheoesophageal fistulae & justify their relationship with polyhydramnios • Explain different stages of lung maturation • Enumerate factors important for normal lung development • Analyze embryological basis and prevention of respiratory distress syndrome in a premature infant 	LGIS	MCQ's SEQ's SAQ's OSPE VIVA VOCE
3	Birth defects	Analyze the embryological basis of common birth defects induced by chromosomal and / or environmental factors	<ul style="list-style-type: none"> • Summarize principles of teratology • Classify teratogens with associated human malformations in a tabulated form (thalidomide disaster, TORCH: toxoplasmosis, rubella, 	LGIS	MCQ's SEQ's SAQ's OSPE VIVA VOCE

			<p>cytomegalovirus, herpes, physical: x-rays and hyperthermia, alcohol, smoking, vitamin, mercury, lead, androgens, maternal diabetes and obesity, antiepileptics)</p> <ul style="list-style-type: none"> • Identify critical period of prenatal human development • Enumerate numerical & structural chromosomal abnormalities • Relate the embryological basis of Trisomy 13, 18 & 21, Klinefelter and Turner syndrome with their clinical presentations • Relate the embryological basis of Cri-du-chat, Angelman and Prader-Willi syndrome with their clinical presentations • Explain embryological basis of mosaicism • Discuss invasive and noninvasive approaches for assessing growth and development of fetus in utero 	
--	--	--	--	--

4	Development of body cavities	Correlate the development of body cavities with common congenital anomalies	<ul style="list-style-type: none"> • Describe the formation of intra embryonic coelom and its divisions • Correlate the effects of folding with relocation of different parts of intra embryonic coelom • Elucidate the processes involved in partitioning of intra embryonic coelom into definitive body cavities • Explain the contribution of different developmental sources of Diaphragm • Correlate the nerve supply of diaphragm with its developmental sources • Correlate the anomalies of ventral body wall and the diaphragm with normal development 	LGIS	MCQ's SEQ's SAQ's OSPE VIVA VOCE
5	Development of skeletal system	Correlate the development of different components of skeletal system with common congenital anomalies	<ul style="list-style-type: none"> • Identify the sources of origin of skeletal system • Revisit the parts and derivatives of a somite • Describe the normal development of vertebral column with emphasis on 	LGIS	MCQ's SEQ's SAQ's OSPE VIVA VOCE

			<p>mesenchymal, cartilaginous and bony stages of development with special focus on process of resegmentation</p> <ul style="list-style-type: none"> • Describe the development of ribs and sternum • Define spina bifida • Distinguish various types of spina bifida on embryological basis • Appraise prenatal prevention and prenatal diagnosis of spina bifida • Explain embryological basis of accessory ribs, variation in number of vertebrae, abnormal vertebral curvatures and sternal anomalies. 		
6	Development of muscular system	Correlate the development of muscular system with common congenital anomalies	<ul style="list-style-type: none"> • Identify the sources of origin of different types of muscles • Enumerate the muscles derived from primaxial and abaxial domains of myotome in different regions of body • Discuss the embryological basis of Poland sequence, Prune belly syndrome 	LGIS	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			and congenital torticollis		
7	Development of Limbs	Correlate the development of different components of limb with different types of limb defects	<ul style="list-style-type: none"> • Describe the formation and growth of limb buds • Define apical ectodermal ridges and discuss its role in limb development including digits • Correlate the rotation of upper and lower limbs with the development of compartments and nerve supply • Compare the development of upper and lower limbs. • Describe the role of Thalidomide in limb anomalies in relation with critical period of limb development • Define various abnormalities of limbs(Amelia, Phocomelia, micromelia, meromelia, syndactyly with its types, brachydactyly, ectrodactyly, polydactyly, cleft hand and foot, absence of limb bones) 	LGIS	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			<ul style="list-style-type: none"> Describe the embryological basis causes, gender distribution and clinical features of club foot and congenital dislocation of hip joint 		
8	General anatomy of skin and fascia	Apply the general anatomical concept of skin and fascia in understanding of their regional distribution and differentiation	<ul style="list-style-type: none"> Enumerate the components of integumentary system Enumerate skin layers and its appendages with their general features Elucidate the clinical significance of cleavage lines and finger prints Relate the degree of burn to skin layer affected Classify fascia and its modification with examples (superficial and deep fascia, retinacula, capsule, bursa etc. 	LGIS	MCQ's, SEQ's, SAQ's, Viva voce,
9	General anatomy of nervous system	Correlate the general anatomical structures of different parts of nervous system with its functional importance	<ul style="list-style-type: none"> Classify nervous system on anatomical and physiological basis Enumerate the components of central and peripheral nervous system Trace the formation, 	LGIS	MCQ's, SEQ's, SAQ's, Viva voce,

			<p>distribution/ course and branches of a typical spinal nerve</p> <ul style="list-style-type: none"> • Appraise the formation of nerve plexus in limbs • Define a dermatome • Appraise the clinical importance of dermatome • Define autonomic nervous system (ANS) • Tabulate the differences between autonomic and somatic nervous system • Enumerate the main divisions of ANS • Describe the differences of two main divisions of ANS in tabulated form 		
--	--	--	---	--	--

Locomotor II

Sr no	Topic / Theme	Learning Outcomes	Learning Objectives	MIT	Assessment Tool
1	Hip bone, Femur, Tibia, Fibula, Patella	Appraise the topographic orientation of major bones of lower limb along with their attachments and articulations	<ul style="list-style-type: none"> • Demonstrate the anatomical position of hip bone, Femur, Tibia, Fibula & Patella • Demonstrate the side of bone • Identify important bony landmarks and attachment of 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			<p>hip bone, Femur, Tibia, Fibula & Patella on gross inspection and radiographs</p> <ul style="list-style-type: none"> • Appraise the importance of blood supply of head of femur in relation to age related complications of fracture of femoral neck 		
2	Hip Joint	Apply anatomical knowledge of Hip Joint in various clinical scenarios	<ul style="list-style-type: none"> • Describe the articular surfaces, types, capsule, ligaments, synovial membrane, nerve supply, blood supply and important relations of hip joint • Analyze movements of hip joint (muscles responsible for these movements, axis of movements, limiting factors) 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
3	Fascia of lower limb	Appraise the attachments and modification of superficial and deep fascia of lower limb	<ul style="list-style-type: none"> • Trace the lining of Fascia Lata on the skeleton highlighting muscles enclosed and saphenous opening • Describe the formation extent and importance of iliotibial tract. 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
4	Gluteal Region	Correlate the topographic anatomy of muscles and	<ul style="list-style-type: none"> • Demonstrate the major functions of 	SGD	MCQ's, SEQ's,

		neurovascular structure of Gluteal region with their clinical conditions.	<p>muscles of gluteal region</p> <ul style="list-style-type: none"> • Describe the formation of greater and lesser sciatic foramina and enumerate structures passing through them • Enumerate the nerves entering gluteal region and comprehend the origin, important relations and muscles innervated by each • Analyze the effects of injury to superior, inferior gluteal and sciatic nerves with emphasis on various gaits • Enumerate structures deep to gluteus Maximus. • Locate appropriate site of intra gluteal injection with anatomical reasoning <p>Skill</p> <ul style="list-style-type: none"> • Identify muscles and neurovasculature of gluteal on the model/ prosected specimen 		SAQ's, Viva voce, OSPE
5	Compartments of Thigh	Correlate the muscular and neurovascular contents of all compartments of thigh with relevant clinical scenarios	<ul style="list-style-type: none"> • Explain the contents of anterior fascial compartments of Thigh (Muscles, neurovascular 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			<p>bundle, lymph nodes)</p> <ul style="list-style-type: none"> • Appraise the topographic presentation and formation of femoral triangle • Name the contents of femoral triangle in a sequential order • Trace the continuity of different walls of femoral sheath with abdominal fasciae • Describe division of femoral sheath into different compartments while naming their contents • Relate anatomical knowledge of femoral canal and femoral ring with femoral hernia • Justify anatomical basis of presence of femoral nerve outside the femoral sheath • Describe the extent, boundaries and contents of adductor canal • Distinguish different swellings in front of thigh (inflamed lymph nodes, femoral hernia, inguinal hernia) • Appraise the precautionary 	
--	--	--	---	--

			<p>measures in development of femoral hernia</p> <ul style="list-style-type: none"> • Trace the area of drainage of different groups of inguinal lymph nodes • Describe the functions of muscles of thigh to understand the displacement of fragments of fractured femur • Explain the contents of medial fascial compartments of thigh (muscles, neurovascular bundle, lymph nodes) • Explain the contents of posterior fascial compartment of thigh (muscles, neurovascular bundle, vascular anastomosis, lymph nodes) • Correlate the sign and symptoms of sensory and motor loss with the level of injury of femoral, sciatic and obturator nerves <p>Skill</p> <ul style="list-style-type: none"> • Identify the attachments of muscles of anterior compartment of 	
--	--	--	--	--

			<p>thigh on skeleton, cadaver, models</p> <ul style="list-style-type: none"> • Mark the femoral artery, femoral nerve & sciatic nerve, superficial and deep inguinal rings on surface of subjects • Identify the muscles and neurovascular structures of thigh on the prosected specimen 		
6	Popliteal fossa	Explain the locations, boundaries and contents of popliteal fossa	<ul style="list-style-type: none"> • List the structures forming various boundaries of popliteal fossa • Identify the contents of popliteal fossa in a sequential order in upper, middle and lower part of fossa • Draw and label genicular anastomosis and discuss its clinical significance 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
7	Knee joint	<ul style="list-style-type: none"> • Analyze the structure and mechanism of knee joint movements • Relate the knowledge of knee joint to relevant injuries 	<ul style="list-style-type: none"> • Describe the articular surfaces, capsule, ligaments (intra & extra articular), synovial membrane, nerve supply, blood supply, important relations of knee joint • Elucidate the various movements of the joint (axes, limiting factors) 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			<p>and muscles involved)</p> <ul style="list-style-type: none"> Analyze mechanism of locking and unlocking of knee joint while foot is off or on the ground Correlate various types of bursae (communicating & non communicating bursae) to their clinical significance Identify role of vastus medialis in stability of patella Analyze various meniscal injuries 		
8	Tibiofibular joint		<ul style="list-style-type: none"> Outline various types of tibiofibular joint 	SGD	Viva voce
9	Compartments of leg	Apply the knowledge of anatomy of leg in analyzing relevant clinical scenarios	<ul style="list-style-type: none"> Explain the contents of three fascial compartment of leg (muscles, neurovascular bundle, lymph nodes) Justify the role of soleus as peripheral heart with anatomical reasoning Justify various clinical presentations in injury to lateral side of knee joint (e.g., fractured neck of fibula) 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			<p>according to nerve injury</p> <p>Skill</p> <ul style="list-style-type: none"> • Mark the common peroneal & tibial nerve on the surface of given subject • Identify the muscles and neurovascular structures of leg on a given prosected specimens 		
10	Ankle joint	Correlate the anatomical knowledge of ankle joint with relevant ankle injuries	<ul style="list-style-type: none"> • Describe the articular surface, types, capsule, ligaments, synovial membrane, nerve supply and blood supply of ankle joint • Elucidate the various movements of ankle joint (axes, limiting factors and muscle involved) • Explain important relations of ankle joint with emphasis on structures related to various retinaculae • Justify sensory/ motor loss associated with tibial nerve entrapment in 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			<p>tarsal tunnel syndrome</p> <ul style="list-style-type: none"> Describe the anatomical basis of ankle sprain <p>Skill</p> <ul style="list-style-type: none"> Identify the arrangements of tendons, arteries and nerves in the region of ankle joint (in relation to retinacula of ankle in the given model/ specimen) 		
11	Articulated foot	Describe the arches of foot Describe the mechanism of inversion and eversion of foot	<ul style="list-style-type: none"> Recognize important bony landmarks, muscular and ligamentous attachments on calcaneus & talus Describe the inversion and eversion of foot with reference to joints, axes and muscles involved Describe the formation of arches of foot and factors responsible for their stability Justify clinical importance of arches of foot (flat foot) <p>Skill</p> <ul style="list-style-type: none"> Identify bones in an articulated foot and on radiographs Demonstrate anatomical position determine the side of 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			calcaneus and talus		
12	Foot Dorsum	Outline topographic anatomy of dorsum of foot	<ul style="list-style-type: none"> Analyze the formation of dorsal digital expansion Skill <ul style="list-style-type: none"> Palpate dorsalis pedis on a subject identify extensor digitorum brevis 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
13	Foot sole	Appraise various layers of sole in a sequence	<ul style="list-style-type: none"> Correlate the clinical presentation of planter fasciitis to anatomical knowledge of plantar aponeurosis Skill <ul style="list-style-type: none"> Identify structures in each layer of sole of foot in the prosected specimen / model Recognize the arteries and nerves of sole of foot 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
14	Cutaneous innervation of lower limb	Correlate the knowledge of dermatomes of lower limb to sensory loss	<ul style="list-style-type: none"> Describe the cutaneous nerves of lower limb Illustrate the cutaneous nerves/ dermatomes of lower limb Justify the sensory loss in various nerve injuries in lower limb with focus on cutaneous innervation 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
14	Nerves and plexuses of lower limb	Correlate the distribution of lower limb nerves with effects of relevant nerve injuries	<ul style="list-style-type: none"> Outline the location and formation of 	SGD	MCQ's, SEQ's, SAQ's, Viva voce,

			<p>lumber and sacral plexus</p> <ul style="list-style-type: none"> • List branches of plexuses innervating lower limb • Illustrate lumber and sacral plexus • Analyze the clinical presentation of various nerve injuries (sciatic femoral, obturator, common peroneal, superior gluteal, inferior gluteal) • Correlate the lower limb nerve injuries to common fractures 		OSPE
16	Arterial supply of lower limb	Correlate the blood supply of lower limb with effects of occlusion or damage	<ul style="list-style-type: none"> • Describe the origin, relations and main branches of arteries (Femoral, gluteal, and obturator) with their area of distribution • List the vessels participating in trochanteric and cruciate anastomosis with clinical significance of these anastomoses 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
17	Venous drainage of lower limb	Correlate the anatomical knowledge of superficial and deep veins of lower limb with their surgical significance	<ul style="list-style-type: none"> • Describe the venous drainage of lower limb (superficial and deep veins) • Describe the formation course, tributaries and termination great 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

			<p>and small saphenous veins</p> <ul style="list-style-type: none"> Analyze a case of varicose veins with emphasis on predisposing factors, causes, clinical presentations, role of valves and perforators Appraise the importance of great saphenous veins in CABG <p>Skill</p> <ul style="list-style-type: none"> Mark great and small saphenous veins on given subject 		
18	Lymphatic drainage of lower limb	Appreciate the clinical importance of lymphatics in lower limb	<ul style="list-style-type: none"> Apply the knowledge of lymphatic drainage of lower limb to locate the site of infection or malignancy 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE
19	Surface marking	Locate the site of deeply placed structures of lower limb on skin	<ul style="list-style-type: none"> Mark the nerves and vessels of lower limb on the surface with the help of important bony landmarks 	SGD	MCQ's, SEQ's, SAQ's, Viva voce, OSPE

Practical's

- Trachea
- Lungs

CBL's

CBL-I:

A Case of Lesion of common personal nerve After a major abdominal operation, a patient was given a course of antibiotics by intramuscular injection. The nurse was instructed to give the injections into the right buttock. Later, when the patient left the hospital, he experienced numbness 32 and tingling sensations down the anterior and lateral sides of the right leg and dorsum of foot. His right foot tended to catch on steps & on the edges of carpet. The patient tended to hold the foot plantarflexed & slightly

inverted. Dorsiflexion of right ankle joint was weaker than the same movement of the left ankle. Above mentioned severe symptoms and signs suggested that the injections into the gluteus maximus muscle had been given over the course of sciatic nerve and has caused a lesion of the common peroneal nerve.

Learning Objectives:

- Explain the gross anatomic basis of the sign and symptoms mentioned in the above case.
- Enumerate structures deep to gluteus maximus. Justify the importance of this knowledge with correct method of giving intragluteal injections without injuring neurovascular structures
- Define the term sciatica and its causes.
- Define the term 'foot drop'
- Describe the division of leg into various compartments on the given model, enumerating contents of each compartment.
- Describe the origin, insertion, nerve supply and actions of muscles contained within anterior & lateral compartments of leg.
- Mark the sciatic nerve & common peroneal nerve on the surface of given subject.

CBL 2 A Case of Talar Fracture

A first year medical student enjoyed running for exercise and relief of tension. Near the end of a particularly long and strenuous run, she suddenly developed a severe pain on the bottom of her foot. She immediately stopped running and sat down to rest; the pain subsided somewhat, but persisted. Although she rested from running for several days, the pain did not go away and was particularly apparent if she stood for long periods in the gross anatomy lab. Upon arrival at the hospital her injured foot was swollen, deformed and held rigid. There was tenderness on the bottom of her foot from heel to the heads of the metatarsals, especially just anterior to the calcaneal tuberosity. AP, lateral and oblique x-rays were done, and an undisplaced fracture of the talar neck was shown. Neurological tests revealed no nerve involvement other than the pain, which appeared to be related entirely to the soft tissues on the bottom of her foot. The orthopedic surgeon ordered a split plaster of Paris that should be reapplied when swelling settles

Learning objectives

- Describe the type, ligaments, nerve supply, blood supply, and important relations of ankle and subtalar joints.
- Describe the articulation, line of capsular attachment, synovial membrane & movements of ankle joint, with the help of given bones and model.
- Explain the fracture dislocations of the ankle joint addressing the causative factors and involvement of bones participating in ankle joint.
- Differentiate between acute sprains of lateral ankle and medial ankle

- Enlist the soft tissue structures which are located on the bottom of the foot between the calcaneal tuberosity and the heads of the metatarsals.
- Name the single fibrous structure which spans the same bones.
- Explain the functions of the plantar aponeurosis, long plantar, spring and short plantar ligaments.
- Explain the mechanism of talar fracture as a result of a fall on the heel, on anatomical basis. Name other bones that may fracture from such trauma. Enlist the complication which arises from such a fracture.

Physiology

Sr no	Learning Outcomes	Learning Objectives	MIT	Assessment Tool
1	Appraise the physiological mechanisms controlling the functions of respiratory system and its regulation.	<ul style="list-style-type: none"> • Recognize the functional anatomy of various parts of respiratory system • Highlight the non- respiratory functions of respiratory tract 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
2		<ul style="list-style-type: none"> • Distinguish functions of inspiratory and expiratory muscles during quiet and forceful respiration • Correlate normal lung volumes/capacities to various pressures and volume changes during forceful respiration 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
3		<ul style="list-style-type: none"> • Discern lung and chest wall compliance • Identify composition & role of surfactant in alveolar surface tension • State concept of work of breathing 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
4		<ul style="list-style-type: none"> • Appreciate the layers of 	Online LGIS/	MCQ/SAQ/

		respiratory membrane in detail <ul style="list-style-type: none"> • Appraise concept of diffusing capacity through respiratory membrane • Identify factors affecting gas diffusion through Respiratory membrane. 	SGD/ CBL/ Tutorial	structured viva
5		<ul style="list-style-type: none"> • State the mechanics of oxygen diffusion from alveoli to blood • Distinguish mechanism of oxygen transport in the arterial blood, tissue fluid and cell 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
6		<ul style="list-style-type: none"> • Identify the role of Hb in oxygen transport • Analyze normal oxygen hemoglobin dissociation curve by explaining factors that shift oxygen- hemoglobin dissociation curve to right and left 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
7		<ul style="list-style-type: none"> • Identify various chemical form in which CO₂ is transported in blood • Discern normal CO₂ dissociation curve explaining Bohr effect, Haldane effect and chloride shift 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva

8		<ul style="list-style-type: none"> • State different group of neurons composing respiratory center • Review nervous control of inspiration and respiratory rhythm • Recognize the regulatory mechanism of hering-breuer inflation reflex 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
9		<ul style="list-style-type: none"> • Appraise location, function and stimulation (by CO₂ and H⁺) of central chemo sensitive area • Identify the role of Peripheral chemoreceptors for control of respiration Determine the composite effects of PCO₂, pH, & PO₂ on alveolar ventilation 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
10		<ul style="list-style-type: none"> • Appreciate pressure differences b/w pulmonary & systemic circulation • Analyze the pulmonary blood flow and effect of hydrostatic pressure on it and the concept of ventilation perfusion ratio 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
11	Relate, compare and interpret the sign &	<ul style="list-style-type: none"> • Identify various 	Online LGIS/	MCQ/SAQ/

	symptoms and pathophysiology related to various respiratory disorders.	<p>causes of hypoxia</p> <ul style="list-style-type: none"> Analyze effects of hypoxia on the body and role of oxygen therapy in different types of hypoxia 	SGD/ CBL/ Tutorial	structured viva
12		<ul style="list-style-type: none"> List causes of cyanosis and asphyxia Enunciate hypercapnia & its association with various forms of hypoxia Interpret effects of very high blood CO₂ levels on respiratory center 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
13		Discuss the causes and pathophysiology of obstructive lung diseases and evaluate its effects on respiration	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
14		<ul style="list-style-type: none"> Discuss the causes and pathophysiology of Restrictive lung diseases and evaluate its effects on respiration Draw and explain the spirogram of obstructive and restrictive lung diseases Differentiate between 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva

		Obstructive and restrictive lung disease based on spirometry and FEV1/ FVC ratio		
15	Recognize the physiological adjustments in unique environments.	<ul style="list-style-type: none"> Analyze the mechanism of acclimatization of the body to low O₂ Identify and explain the causes of natural acclimatization in natives of High altitude Study the principles of acclimatization 	Online LGIS/SGD/CBL/Tutorial	MCQ/SAQ/structured viva
16		<ul style="list-style-type: none"> Explain causes, pathophysiology & clinical features of AMS/HAPE/HA CE State prevention and treatment of AMS/HAPE/HACE 	Online LGIS/SGD/CBL/Tutorial	MCQ/SAQ/structured viva
17		<ul style="list-style-type: none"> Analyze changes in physiology under deep sea Describe the pathophysiology, clinical features, prevention and treatment modalities of Decompression sickness, Nitrogen Narcosis, Oxygen and carbon dioxide toxicity 	Online LGIS/SGD/CBL/Tutorial	MCQ/SAQ/structured viva

		Identify uses of hyperbaric oxygen therapy		
18		Explain the effects of G forces and microgravity on the body	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
19	Appraise the respiratory and cardiovascular adjustments in body during exercise.	<ul style="list-style-type: none"> • Correlate the various muscle metabolic systems used as energy substrates with the type of exercise i.e. aerobic and anaerobic. • Relate the effects of types of exercise, muscle fatigue and VO₂max on exercise performance • Explain the significance of oxygen debt. • Describe the effects of training on the heart and coronary circulation and how these changes contribute to an increase in VO₂max. 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva
20	Explain the physiology of temperature regulation.	<ul style="list-style-type: none"> • Explain the mechanism heat gain and heat loss from the body. • Describe the role of anterior and posterior 	Online LGIS/ SGD/ CBL/ Tutorial	MCQ/SAQ/ structured viva

		Pituitary in temperature regulation. Discuss the mechanism of fever.		
--	--	---	--	--

RACTICAL			
Sr no.	Topic	Instructional Strategies	Assessment Tool
1	Measurement of peak expiratory flow rate	SGD	OSPE
2	Spirometry	SGD	OSPE
3	Measurement of blood pressure	SGD	OSPE
4	Auscultation of heart sounds	SGD	OSPE
5	Examination of apex beat	SGD	OSPE

CBLs Physiology

CBL 1: Cardiac Failure

A 65 years old man suddenly woke up while sleeping during night due to severe breathlessness. On reaching emergency, his blood pressure was 105/70 mm Hg and pulse rate was 110/ minute. On physical examination, he had pitting edema of legs and sacral region, and raised JVP. Auscultation of lungs revealed fine crepitations. Further investigations revealed a low cardiac output of 4 L/min and right atrial pressure of 10 mmHg. His chest radiograph showed marked enlargement of heart while ECG revealed Q wave in leads V3 and V4. Doppler Echocardiography revealed ejection fraction of 30%. Physician diagnosed that the patient was suffering from congestive cardiac failure due to past myocardial infarction.

Learning objectives

At the end of the session, the students should be able to:

- Discuss the case scenario.
- Define and classify heart failure.
- Discuss stages of cardiac failure.
- Explain the compensatory mechanisms.
- Differentiate in acute and chronic failure.
- Discuss the physiology of treatment of heart failure.
- Discuss the role of Starling forces in development of symptoms of cardiac failure.

CBL 2: Shock

62 year old Mrs. Asim had a road traffic accident causing multiple injuries and profuse bleeding. In the emergency department she was observed to be conscious but pale, cold, and very anxious. Her pulse was rapid and thready with following observations:

	Lying down (supine)	Standing
Blood Pressure	90/60mmHg	75/45 mmHg
Heart Rate	105 beats/min	135 beats/min

An infusion of normal saline was started, and a blood sample was drawn to be typed and cross-matched to prepare for a blood transfusion. Because of the quantity of blood lost, she received two units of whole blood and was admitted for further care.

The physicians were prepared to insert a bladder catheter to allow continuous monitoring of urine output. However, by the next morning, her normal colour had returned, her blood pressure, both lying and standing, had returned to normal. However, she was retained for treatment of the injuries sustained during the accident.

Learning Objectives:

At the end of the session, the students should be able to:

- Discuss the given case scenario.
- Explain circulatory shock and its stages.
- Explain the sequence of events that decrease the arterial pressure after blood loss.
- Summarize the compensatory mechanism which gets activated as a result of cerebral ischemia secondary to marked hypotension.
- Discuss the physiological cause of pale cold skin and rapid thready pulse in the patient.
- Explain why the physicians consider monitoring her urine output.

CBL 3:DIFFICULTY IN BREATHING

A 10-year-old boy is brought to the emergency department with difficulty in breathing that developed while playing football. The boy has a history of allergies, including pollen allergy, but never previously had this level of respiratory difficulty. He now complains of tightness in the chest. There is no family history of allergies or asthma. Both parents smoke cigarettes.

Vital Signs:

Temperature 37°C,

Pulse 120/min,

Respiratory rate 30/min and shallow,

BP 110/95 mm Hg

Physical

Examination:

Patient is wheezing, anxious, and short of breath. The wheezing is more prominent on exhalation, and there is an extended forced expiratory phase. The chest anteroposterior diameter appears large for age and size. The nasal mucosa is edematous, and the pharynx is coated with a clear postnasal discharge.

A beta 2-adrenergic agent is administered by an inhaler, relieving the symptoms immediately. The patient's anxiety is relieved, and heart rate and breathing rate returned to normal. After pulmonary function tests the diagnosis of Asthma is made.

Learning objectives:

At the end of the session the students should be able to:

- Enlist the passages through which air passes from the exterior to the alveoli.
- Enlist the major muscles involved in respiration, state the role of each.
- Discuss lung compliance and airway resistance.
- Discuss various pressures that cause the movement of air in and out of lungs.
- Explain the role of surfactant on surface tension.
- Discuss the basic lung defense mechanisms and metabolic functions of lungs.

CBL 4:WHEEZING

A 55-year-old man with a history of a chronic lung disease presents to his primary care physician with worsening shortness of breath. He was diagnosed about 1 year ago. He gives a history of smoking cigarettes (one pack a day for 30 years) but has no other medical problems. His general appearance is that of a thin male who appears to be in mild distress. His cardiac examination is normal, but he is noted to have an expanded anterior-posterior diameter of the chest with expiratory wheezes and breathing through pursed lips. A chest x-ray reveals hyper inflated lung fields bilaterally and no infiltrates. The patient's physician

recommends spirometry to differentiate emphysema, which is an obstructive pulmonary disorder, from restrictive lung disease.

Learning objectives:

At the end of the session the students should be able to:

- Discuss the alteration in dynamic Enlist various obstructive and restrictive lung disease processes.
- Differentiate between obstructive and restrictive lung disease and explain their pathophysiology.
- Lung volumes in obstructive and restrictive lung disorders.
- Explain the concept of ventilation-perfusion matching.
- Discuss physiological shunt and physiological dead space.

CBL 5: BREATHLESSNESS AFTER EXERCISE

Asif, a 25-years- old young man of average built was enjoying good health. One day he decided to do some exercise and went for jogging. After about a round of one kilometer, he felt severe palpitation and breathlessness. Becoming concerned, he went to hospital. His pulse was 100/min, BP – 145/85 mmHg and respiratory rate was 28/min.

The doctor advised him spirometry at rest and as well as after exercise. Following were the findings after which doctor reassured and sent him to his home.

	At Rest	After Exercise
Tidal Volume (ml)	500	1000
Inspiratory reserve volume (ml)	3000	4000
Expiratory reserve volume (ml)	1100	1500
Vital Capacity (ml)	4600	6500

Learning objectives:

At the end of the session the students should be able to:

- Co-relate the changes in thoracic cage, pulmonary pressures and compliance of lung at rest and in exercise.
- Discuss simple spirometry and its limitations. Also discuss the method to determine the volumes and capacities not measured by simple spirometry.

- Explain the concept of work of breathing and factors affecting it.
- Discuss pulmonary and alveolar ventilation during rest and exercise. Also explain the method to determine alveolar ventilation.
- Explain the zones of pulmonary blood flow and changes during exercise.
- Explain the factors affecting diffusion of gases across the respiratory membrane.

CBL 6: SEVERE FATIGUE

35-year-old Qasim, a resident of Karachi, went to Nanga Parbat base camp along with his two friends, 35-year old Rashid and 34-year-old Ahad. Nanga Parbat is ninth highest mountain in the world (Height of Nanga Parbat is 26,660 ft and height of base camp is 10,800 ft above sea level). The atmospheric pressure is around 500mmHg at the base camp. On day 2 of their trip they started to ascend the mountain from the base camp. After 2 hours, Rashid started feeling dizzy. He complained of severe fatigue and headache. After a few hours he started coughing and developed severe dyspnoea and confusion. Their guide, who was a local resident suggested that they return immediately. After their return to base camp, he was provided 100% O₂. His symptoms subsided within few hours.

Learning Objectives:

At the end of the session, the students should be able to:

- Discuss the effects of hypoxia on Rashid's body.
- Explain why the arterial partial pressure of oxygen decreases on high altitude.
- Discuss the mechanism of acclimatization for high altitude by the body.
- Compare and contrast the features of acute and chronic mountain sickness.
- Discuss the effects of low and high pressures of gases on the body.
- Explain the effect of high altitude on the work capacity of natives when compared to person living at sea level.

Discuss the effect of breathing 100% O₂ on Rashid's arterial partial pressure of oxygen and breathing rate.

First Professional MBBS Examination (2021)

PHYSIOLOGY

Table of Specifications for Annual First Professional Examination:

Theory Time Allowed = 03 hrs (Including MCQs)

Marks of theory paper = 80

Internal assessment = 20

Total marks = 100 Pass Marks = 50

Sr No	Topic	Number of MCQs (40) Recall: 16 Application: 24 01 mark each		Number of SAQs/SEQs (08) 05 Marks each	
		Recall	Application	3x Recall, 3x Application	2 x Application
1	Cell + Nerve muscle	04	05	01	Any 2 from whole course
2	Blood	05	07	01	
3	CVS	04	07	02	
4	Respiration + Environment + Sports	03	05	02	
	Total	40 (40 Marks)		08 (40 Marks)	

Theory: Internal Assessment (IA) Calculation (20 Marks)

Exam	Weightage	Exam	Percentage
End of Block Pre-Annual Exam	80 %	End of Block Exam – I	20
		End of Block Exam – II	20
		End of Block Exam - III	20
		Pre-Annual Exam	20
Modular Exam	20%	Modular Tests	10
		Assignments	10
Total	100%		100%

Biochemistry

S.No	Learning Outcomes	Learning Objectives	MIT	Mode of assessment
			LGIS/ SGD/ CBL/ Practical/ Tutorial	
End of the session, the student should be able to:				MCQs/ SEQs/ OSCE/ Structured Viva
1.	To understand the structure, functions, classification, biochemical significance, deficiency and excess manifestations, and clinical importance of Vitamins	Classify various types of vitamins	Online LGIS/ SGD/ CBL/ Tutorial	MCQs/ SEQs
		Discuss chemistry, sources, biochemical functions, deficiency manifestations and daily allowance of water soluble vitamins (vitamin C, B1, B2, B3, B6, pantothenic acid, folic acid, biotin and B12)	Online LGIS/ SGD/ CBL/ Tutorial	MCQs/ SEQs
		Discuss chemistry, sources, biochemical functions, deficiency manifestations, daily allowance, and hypervitaminosis of fat soluble vitamins (vitamin A, D, E, and K)	Online LGIS/ SGD/ CBL/ Tutorial	MCQs/ SEQs
2.	Apply the knowledge of protein metabolism for understanding	Metabolism of Proteins and amino acids	Online LGIS/ SGD/ CBL/ Tutorial	MCQs/ SEQs

g relevant metabolic disorders	Explain the mechanism of Amino acid oxidation.	Online LGIS/ SGD/ CBL/ Tutoria l	MCQs/ SEQs
	Describe various metabolic fates of an amino acid	Online LGIS/ SGD/ CBL/ Tutoria l	MCQs/ SEQs
	Define and exemplify various mechanisms of transamination, deamination decarboxylation, deamidation.	Online LGIS/ SGD/ CBL/ Tutoria l	MCQs/ SEQs / OSCE
	Describe the transport of amino group, role of Pyridoxal phosphate, Glutamate, Glutamine, Alanine	Online LGIS/ SGD/ CBL/ Tutoria l	MCQs/ SEQs / OSCE
	Outline the mechanism of Nitrogen excretion from the human body	Online LGIS/ SGD/ CBL/ Tutoria l	MCQs/ SEQs / OSCE
	Explain in detail the concept of Ammonia intoxication.	Online LGIS/ SGD/ CBL/ Tutoria l	MCQs/ SEQs / OSCE
	Draw Urea cycle and discuss its	Online LGIS/ SGD/	MCQs/ SEQs / OSCE

		regulation in detail.	CBL/ Tutoria 1	
		Describe Genetic defects of Urea cycle	Online LGIS/ SGD/ CBL/ Tutoria 1	MCQs/ SEQs
		Comprehend Carbon skeletal metabolism and its importance	Online LGIS/ SGD/ CBL/ Tutoria 1	MCQs/ SEQs
		Describe Functions, pathways of amino acid degradation and genetic disorders of individual amino acids.	Online LGIS/ SGD/ CBL/ Tutoria 1	MCQs/ SEQs / OSCE
		Describe Fibrous and globular proteins	Online LGIS/ SGD/ CBL/ Tutoria 1	MCQs/ SEQs / OSCE

Medicine

Sr No	Topic	Learning outcomes	Learning objectives	MIT	Assessment Tool
1	Obstructive Lungs disease	Diagnose various obstructive lung diseases on the basis of clinical features and lung function test	<ul style="list-style-type: none">• Clinical features of obstructive lung diseases• lung function tests• Describe effects on lung physiology	Lectures / SGD	MCQ's

2	Restrictive lungs disease	Diagnose various restrictive lung diseases on the basis of clinical features and lung function tests	<ul style="list-style-type: none"> • Clinical features of restrictive lung diseases • lung function tests • Describe effects on lung physiology 	Lectures / SGD	MCQ's
3	Respiratory distress syndrome	Recognize respiratory distress syndrome	<ul style="list-style-type: none"> • Identify respiratory distress syndrome • Enumerate its common causes 	Lectures / SGD	MCQ's
4	Acute and chronic mountain sickness	<ul style="list-style-type: none"> • Plan a strategy for prevention and treatment of acute and chronic mountain sickness • Describe HAPE and HACE 	<ul style="list-style-type: none"> • Diagnose acute and chronic mountain sickness by its clinical features • Describe HAPE and HACE • Plan a strategy for its prevention and treatment 	Lectures / SGD	MCQ's
5	Respiratory Failure	Plan a treatment strategy for respiratory failure	<ul style="list-style-type: none"> • Diagnose respiratory failure • Enumerate its common causes 	Lectures / SGD	MCQ's

			<ul style="list-style-type: none"> Plan a treatment strategy 		
6	Pulmonary Embolism	Diagnose pulmonary embolism by its clinical features and appropriate investigations relating to its physiology	<ul style="list-style-type: none"> Enumerate risk factors of DVT/ Pulmonary embolism Diagnose pulmonary embolism by its clinical features Plan appropriate investigations for diagnosis 	Lectures / SGD	MCQ's
7	Pleural Effusion	Diagnose pleural effusion by its clinical features and appropriate investigations relating to its physiology	<ul style="list-style-type: none"> Diagnose pleural effusion by its clinical features Describe effects of pleural effusion on lung physiology Plan appropriate diagnostic investigations 	Lectures / SGD	MCQ's
8	Pneumonia /Bronchiectasis	Diagnose pneumonia/ Bronchiectasis by its clinical features and appropriate investigations	<ul style="list-style-type: none"> Diagnose clinical features of pneumonia/ Bronchiectasis 	Lectures / SGD	MCQ's

		relating to its physiology	<ul style="list-style-type: none"> • Describe effects on lung physiology • Plan appropriate diagnostic investigations 		
--	--	----------------------------	---	--	--

Surgery

Anatomy

Sr No	Topic / Theme	Learning Outcomes	Learning Objectives	MIT	Assessment Tool
1	Respiratory and High altitude				
2	Locomotor- II (Lower Limb)	Correlate the anatomical knowledge of lower limb with various clinical presentations.	<ul style="list-style-type: none"> • Analyze the anatomical basis of given clinical conditions: <ul style="list-style-type: none"> ○ Varicose veins ○ Saphenous venous grafts. ○ Venous ulcers ○ Venous thrombosis ○ Thrombophlebitis • Identify the sites of Venae sections. • Identify effects and causes of fractures of femur, tibia, fibula and hip bone • Identify effects and causes of 	LGIS	MCQ's

			<p>dislocation of hip, knee and ankle joints.</p> <ul style="list-style-type: none"> • Discuss various lower bursae and their clinical significance, popliteal cyst formation, cox valgus/ varus, Genu varus /valgus, flat foot. • Discuss clinical presentation of nerve injuries/ compression • Appraise the indications and levels of limb various amputations • Discuss phantom limb pain 		

Research Methodology

Sr No	Topic / Theme	Learning Outcomes	Learning Objectives	MIT	Assessment Tool
1	Literature Review	Able to search scientific literature related to the chosen topic from medical data basis and digital library/ from internet/ library	Purpose and types of literature medical literature (original study. Case study systematic review, Meta-analysis); Sources of information Libraries - provide access to many types of resources	LGIS/ Group assignment	MCQ/ SEQ

			<ul style="list-style-type: none"> • Internet / Databases • Books • Journals /Conference proceedings 		
2	Literature search	Perform scientific literature search on selected topic by using different technique/ methods.	<p>Search techniques, use of keywords, Boolean searching</p> <ul style="list-style-type: none"> • Understand the steps in conducting a systematic review • Develop an answerable question using the “Participants Interventions Comparisons Outcomes” (PICO) framework • Interpret the results of metaanalyses 	LGIS/ Group assignment	MCQ/ SEQ
3	Operational definition Hypothesis	Formulate operational definition and research hypothesis	Formulation of operational definition of impotent variables. Types of research hypothesis	LGIS/ SGD	MCQ/ SEQ



Learning Resources

Anatomy

- a) Clinical Anatomy for Medical Students by Richard Snell (9th edition).
- b) Basic Histology Text and Atlas by Luiz Carlos and Junqueira (14th edition)
- c) Basic Histology by Laiq Hussain Siddiqui (5th Revised edition)
- d) Medical Embryology by Langman (14th edition).
- e) Essential Clinical Anatomy by Keith Moore (7th edition).
- f) The Developing Human by Keith Moore (10th edition).
- g) General Anatomy by Laiq Hussain Siddiqui.

Physiology

- a) Guyton and Hall Textbook of Medical Physiology, 13th Edition by John E. Hall.
- b) Human Physiology: From Cells to Systems, 9th Edition by Lauralee Sherwood.
- c) Ganong's Review of Medical Physiology, 25th Edition (LANGE Basic Science) by Kim E. Barrett, Susan M. Barman, Scott Boitano, Heddwen Brooks.
- d) Practical physiology by CL Ghai
- e) Electronic modes

Bio chemistry

- a) Lippincott's illustrated reviews, 7th edition
- b) Harper's illustrated Biochemistry, 30th edition
- c) M.N Chatterjea Textbook of Biochemistry , 8th edition
- d) M.D Vasudevan, Sreekumari, M.D.S;Kannan, M.D. Vaidyanathan D.M Textbook of Biochemistry for medical students, 2016
- e) Practical Biochemistry Manual (Prof Maj Gen AK Naveed, Dr Shakir Khan)
- f) Electronic modes

Feedback on the study guide

We value your feedback and will use it for improvement of this Study guide.

Kindly provide feedback for this study guide. At the email: dme@ckmc.edu.pk

References

HARDEN, J.M. LAIDLAW, E.A. HESKETH, R. M. (1999). AMEE Medical Education Guide No 16: Study guides-their use and preparation. *Medical Teacher*, 21(3), 248–265. <https://doi.org/10.1080/01421599979491>