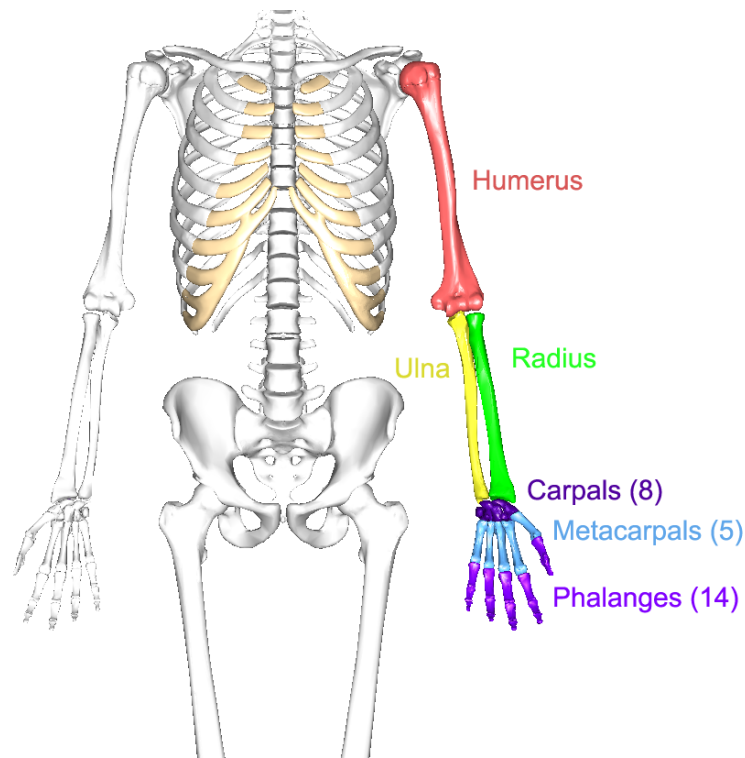




RIHS MEDICAL & DENTAL COLLEGE INTEGRATED CURRICULUM



MUSCULOSKELETAL (II)

MODULE 10204

Session 2022-23

FIRST YEAR MBBS

STUDY GUIDE

PLANNED AND DESIGNED BY:

PROF. SABIHA M HAQ

Module 10204: MUSCULOSKELETAL MODULE II

Session 2022-23

Placement in curriculum: Module code: 10204 (Year 1, block- 02, module 04) Pre-requisite: Foundation, Musculoskeletal I & Hematology modules

Teaching faculty & Curriculum committee members

	Disciplines	Name of Faculty
1.	Principal & HOD Ophthalmology	Prof. Dr. Shakaib Anwar
2.	Anatomy	Prof. Dr. Sabiha M. Haq
3.	Physiology	Prof. Dr. Jan Alam
4.	Biochemistry	Prof. Dr. Rehan Khwaja
5.	Pathology	Prof. Dr. Bushra
6.	Pharmacology	Prof. Dr. Azam Zia
7.	Community Medicine	Prof. Dr. Mirza Inamul Haq
8.	Forensic Medicine	Dr. Sabika Husain
9.	Behavioral Sciences	Ms. Nargis Munir
10.	Medical & Allied	Prof. Dr. Nadia Shams
11.	Surgery & Allied	Prof. Dr. Shaukat

Module duration	05 weeks
Module co-planner	Prof. Dr. Mirza Inamul Haq
Module Coordinator	Dr. Sidra Ashfaq
Integrated Curriculum	<p>The Integrated Curriculum is becoming an increasingly popular concept internationally, in the field of Medicine.</p> <p>The goal of integration is to break down barriers between the basic and clinical sciences, currently in practice as a result of traditional curricular models.</p> <p>Integration should promote retention of knowledge and acquisition of skills through repetitive and progressive development of concepts and their applications.</p> <p>There are three areas in need of improvement and clarification for successful integration:</p> <ol style="list-style-type: none"> 1. Ensuring synchronous presentation of material 2. Avoiding the tendency to diminish the importance of the basic sciences, and 3. Using unified definitions <p>(MEDICAL TEACHER)</p> <p>The model adapted in this institution is an Integrated, modular, system based, spiral curriculum.</p> <p>First spiral is for two years & second spiral is spread over three years.</p>
Students as a curriculum coordinator and Class Representative	<p>Student involvement in an integrated curriculum is the key to the process of making him a self-directed, competent and ethical learner who can adjust and compete with the latest trends in medical education in today's and tomorrow's world. In order to achieve this:</p> <ol style="list-style-type: none"> 1. Students will help the Module coordinators in accomplishing all tasks assigned to him/her. 2. They will be a part of curriculum planning and implementing team. 3. They will inform/discuss the ongoing activities /problems in teaching and learning with module coordinators and curriculum chairperson.

<p>Module Rationale:</p>	<p>This module has been designed to unfold the structural organization, functions, congenital anomalies and some of the disorders of the limbs, back & skin. It explains the mechanism of neuromuscular transmission, its biochemical basis and the importance of Ca⁺⁺ in the body along with drugs acting at this level. It also highlights the main components of primary survey in a trauma patient along with identification of common fractures of long bones on clinical examination and radiographs of musculoskeletal system along with joint examination. with Teaching in Histology labs to enable the students to recognize different types of muscle, cartilage and bone tissue and skin, under microscope, will enable the student to conceptualize the loco motor system as a whole.</p>
<p>Module Outcomes</p>	<p>At the end of the module each student will acquire the knowledge and terminology necessary to understand the detailed structure, functions, and development of Loco motor system, their examination, radiological appearance, clinical importance and common disorders like fractures, nerve injuries and compartment syndrome. Student will also learn the biochemistry of calcium and protein metabolism and the physiology of neuromuscular transmission and muscle contraction. Relevant disorders like osteoporosis, osteomalacia, rickets and common joint diseases will also be covered.</p>
<p>Teaching & Learning methodology</p>	<p>Large Group Interactive Sessions (LGIS): The goal of interactive lecture is to engage the students' attention, through ways to interact with the content, the instructor, and their classmates. Accordingly, interactive lectures include segments of knowledge transfer combined with segments where students interact. One of the things that make the lecture interactive is the ability of the instructor to select the content of the lecture segments based on the students' needs. This demands a prior search for the baseline knowledge of the students at the start of the lecture. If students have difficulty answering a question, or an activity fails to develop the concept in most student groups, it's time to find a new and better way to deal with the material. LGIS clearly gives a better concept of the content and keeps students'</p>

	<p>attention captured throughout, as compared to yester years' didactic lectures.</p> <p>Small Group Discussion (SGD): 'The purpose and technique of small group teaching is that it is learner-centered, with all students joining in free discussion on a particular topic. A typical 'small group' is around eight to 12 learners facilitated by a teacher. The steps of SGD are Forming, Storming, Norming & Performing. The teacher acts only as a facilitator. Students are allowed to use their books or other search material during the discussion. SGD is a good method to clear the concepts and develop communication and conflict solving skills in the students.</p> <p>Departmental teaching labs: This is performance based teaching & learning methodology where students learn handling and uses of laboratory equipment and models, safety rules and various clinical skills.</p> <p>Dissection: Where necessary teaching of gross Anatomy is aided by cadaver dissection / model demonstration.</p> <p>Problem based/ Task based/ Case based learning (PBL/TBL/CBL): Students are presented with real life problems/tasks/cases. They are motivated through a standard process to seek answers to the given problem, task or case. This is a highly effective method to capture and maintain students' interest in patients' problems and their solution.</p> <p>Assignments and Presentations: Both of these methodologies are meant to make the students self-directed learners and good communicators by seeking knowledge from multiple sources and presenting it.</p>
Assessment methodology:	MCQs, Viva, and OSPE /OSCE.

No.	Core content	Discipline	Learning objectives: At the end of the module the student should be able to:	Teaching strategy	Assessment methodology
1.	Muscle classification (structural and functional)		<ul style="list-style-type: none"> Give an outline of the muscle classifications based on structure and function Relate the action dynamics of muscles to the shape, size and arrangement of its fibres Quote examples for each 	1 LGIS	MCQ
2.	Neurons, peripheral nerves & ganglia	Anatomy	<ul style="list-style-type: none"> Recognize the structure of neurons and peripheral nerves Classify neurons into histological and functional types 	1 LGIS	MCQ
3.	Neurons, peripheral nerves & ganglia	Anatomy	<ul style="list-style-type: none"> Identify neurons and peripheral nerves on given slides State three points of identification Draw and label the diagrams of above slides and state two identification points 	1 Skill lab	OSPE/VIVA
4.	Shoulder girdle & Clavicle	Anatomy	<ul style="list-style-type: none"> Enumerate the bony and soft tissue components of shoulder girdle Identify the general and special features of clavicle State how this bone is different from other long bones Assign the bone to its side Comment on the ossification of clavicle State the clinical importance of clavicle 	1 SGD	OSPE/VIVA
5.	Introduction to carbohydrate chemistry	Biochemistry	<ul style="list-style-type: none"> Define carbohydrates Give biomedical importance of carbohydrates Classify carbohydrates. 	1 LGIS	MCQ
6.	Scapula	Anatomy	<ul style="list-style-type: none"> Describe the general and special features of scapula Assign the bone to its correct side 	1 SGD	OSPE/VIVA

			<ul style="list-style-type: none"> • Comment on the ossification of scapula • State the clinical importance of scapula 		
7.	Anterior & posterior scapular muscles	Anatomy	<ul style="list-style-type: none"> • Enumerate anterior & posterior scapular muscles • State their origin, insertion & nerve supply • Enumerate the functions of scapular muscles 	1 SGD/ Dissection	OSPE/VIVA
8.	Carbohydrates (Qualitative analysis)	Biochemistry	<ul style="list-style-type: none"> • Define carbohydrates • Classify carbohydrates. • Describe the principle of tests on carbohydrate qualitative analysis (Molisch's Test for all carbohydrates, Iodine Test for polysaccharide). 	Skill Lab	OSPE
9.	Brachial plexus	Anatomy	<ul style="list-style-type: none"> • Describe how brachial plexus is formed • Enumerate the nerves emerging from the roots, divisions and cords of brachial plexus • Describe the important relations of brachial plexus • Describe the effects of Upper cord injury (Erb Duchenne paralysis) • Lower cord injury (Klumpke's paralysis) 	1 LGIS	MCQ
10.	Axilla	Anatomy	<ul style="list-style-type: none"> • Describe the boundaries, walls and contents of axilla • Comment on the clinical importance of axilla and its contents 	1 LGIS	OSPE/VIVA
11.	Adipose tissue	Anatomy	<ul style="list-style-type: none"> • Describe the histology, location and functions of adipose tissue in the body 	1 LGIS	MCQ
12.	Adipose tissue	Anatomy	<ul style="list-style-type: none"> • Identify the structure of adipose tissue under microscope • List two points of identification for each slide • Draw labeled diagram of adipose tissue on sketch book 	1 Skill lab	OSPE

13.	Axillary vessels	Anatomy	<ul style="list-style-type: none"> Describe/dissect axillary vessels & identify their relation to brachial plexus and their branches and tributaries 	1 SGD/ Dissection	OSPE/VIVA
14.	Lymphatic drainage of upper limb & Axillary lymph nodes	Anatomy	<ul style="list-style-type: none"> Describe the lymphatics in the upper limb Classify axillary nodes into groups State the clinical importance of axillary nodes in relation to breast cancer Briefly comment on lymphatic mapping and sentinel node biopsy 	1 LGIS	MCQ
15.	Shoulder joint	Anatomy	<ul style="list-style-type: none"> Describe the gross Anatomy of shoulder joint State why it is an unstable joint Enumerate the muscles performing various movements at shoulder joint Describe its nerve & blood supply Comment on the effects of shoulder dislocation 	1 SGD	MCQ
16.	PBL Arthritis				
17.	Trauma of Bones, Soft Tissues, Joints & Muscles of Upper Limbs	Surgery	<ul style="list-style-type: none"> Classify Fractures and Dislocation Identify Major fracture sites in the upper Limb Identify the Radiological Aspects of fractures & Dislocations of Upper limb 	LGIS	MCQ
18.	Common disorders of Joints	Pathology	<ul style="list-style-type: none"> Define osteoarthritis. Show the concept of basic pathogenic mechanism involved in this disorder List important morphological changes and clinical features of the osteoarthritis 	LGIS 2	MCQ
19.	Blood supply of scapular region	Anatomy	<ul style="list-style-type: none"> Enumerate and identify the vessels supplying the scapula and describe the anastomosis around it 	1 SGD/ Dissection	OSPE/VIVA

20.	Humerus	Anatomy	<ul style="list-style-type: none"> Identify the general and special features of humerus Assign the bone to its correct side Define the carrying angle & angle of humeral torsion & comment on their significance Comment on the ossification of humerus Identify the common fracture sites of humerus & related nerve injuries 	1 SGD	OSPE/VIVA
21.	Muscles of the arm	Anatomy	<ul style="list-style-type: none"> Enumerate anterior compartment muscles in the arm Give their origin, insertion & nerve supply Comment on the functions of anterior compartment muscles Enumerate posterior compartment muscles in the arm Give their origin, insertion & nerve supply Comment on the functions of posterior compartment muscles 	1 SGD/ Dissection	OSPE/VIVA
22.	Histology of muscles	Anatomy	<ul style="list-style-type: none"> Describe the histological features of all three types of muscle tissue, tendons and aponeuroses Describe the importance of tendons and aponeuroses 	1 LGIS	MCQ
23.	Histology of muscles	Anatomy	<ul style="list-style-type: none"> Identify the types of muscle tissue under microscope Describe at least two major points of identification for each type Draw labelled diagrams of the microscopic features of muscle tissue 	1 skill lab	OSPE/VIVA
24.	Carbohydrates analysis	Biochemistry	<ul style="list-style-type: none"> Perform: Fehling's Test which is a qualitative test to detect the reducing sugars 	Skill lab	OSPE/Viva
25.	Vessels in the upper arm		<ul style="list-style-type: none"> Identify the brachial artery, its branches and structures 	1 LGIS	MCQ

			<p>supplied by them</p> <ul style="list-style-type: none"> Identify the main veins in the arm and their tributaries 		
26.	Osteomalacia/Osteopenia/Rickets	Medicine	<ul style="list-style-type: none"> Define Osteopenia, Osteomalacia, Rickets List 3 causes of osteomalacia. Enumerate 5 clinical features of osteomalacia Recognize radiological features of the above disorders 	1 LGIS	MCQ
27.	Chemical properties of monosaccharides	Biochemistry	<ul style="list-style-type: none"> Show understanding of chemical reactions occurring at aldehyde and hydroxyl groups Describe the reducing properties of monosaccharides and their biomedical importance. Grasp the concept of sugar derivatives. 	1LGIS	MCQ
28.	Disaccharides and their importance	Biochemistry	<ul style="list-style-type: none"> Describe the formation of disaccharides by Glycosidic bonds. Explain the biomedical importance of Lactose regarding Lactose intolerance 	1 LGIS	MCQ
29.	Cubital fossa & intravenous injection sites in the upper arm	Anatomy	<ul style="list-style-type: none"> Describe the boundaries and contents of cubital fossa Narrate its clinical importance Comment on the IV injection sites in the upper arm 	1 LGIS	MCQ
30.	Cartilage	Anatomy	<ul style="list-style-type: none"> Classify cartilage into types Indicate the location of each type of cartilage and explain how its type helps in the function of that particular part Describe the histological structure of each type of cartilage 	1 LGIS	MCQ
31.	Cartilage	Anatomy	<ul style="list-style-type: none"> Identify various types of cartilage tissue under 	1 Skill lab	OSPE

			<p>microscope</p> <ul style="list-style-type: none"> List two points of identification for each slide Draw labeled diagram of cartilage tissue on sketch book 		
32.	Radius	Anatomy	<ul style="list-style-type: none"> Identify the general and special features of radius Assign the bone to its correct side Comment on the ossification of radius 	1 skill lab	OSPE/VIVA
33.	Ulna	Anatomy	<ul style="list-style-type: none"> Identify the general and special features of ulna Assign the bone to its correct side Comment on the ossification of ulna 	1 skill lab	OSPE/VIVA
34.	Fascia in the upper limb	Anatomy	<ul style="list-style-type: none"> Describe the fascia in the upper limb 	1 LGIS	MCQ
35.	Flexor compartment	Anatomy	<ul style="list-style-type: none"> Enumerate the flexor compartment muscles in the forearm Identify their origin, insertion & nerve supply Comment on the functions of flexor compartment muscles 	1 SGD/ Dissection	OSPE/VIVA
36.	Carbohydrates	Biochemistry	<ul style="list-style-type: none"> Perform Benedict's Test which is a qualitative and semi quantitative test for reducing carbohydrates. Perform Barfoed's Test to determine whether the reducing sugar is a monosaccharide or disaccharide 	1 Skill lab	OSPE/Viva
37.	Vessels & nerves in the flexor compartment	Anatomy	<ul style="list-style-type: none"> Identify the vessels and nerves in the flexor compartment Identify their course and the structures supplied 	1 SGD/ Dissection	OSPE/VIVA
38.	Extensor compartment	Anatomy	<ul style="list-style-type: none"> Enumerate the extensor compartment muscles in the forearm Identify their origin, insertion & nerve supply Comment on the functions 	1 SGD/ Dissection	OSPE/VIVA

			<p>of extensor compartment muscles</p> <ul style="list-style-type: none"> • Comment on the result of injury to these: <ul style="list-style-type: none"> ○ Nerves ○ vessels 		
39.	Vessels & nerves in the extensor compartment	Anatomy	<ul style="list-style-type: none"> • Identify the vessels and nerves in the extensor compartment • Identify their course and the structures supplied • Comment on the result of injury to these: <ul style="list-style-type: none"> ○ Nerves ○ vessels 	1 SGD/ Dissection	OSPE/VIVA
40.	Definition and Classification	Biochemistry	<ul style="list-style-type: none"> • Define enzymes and its chemical nature • Classify the enzymes with appropriate examples • Define coenzymes, cofactors. 	LGIS	MCQ
41.	Carbohydrates	Biochemistry	<ul style="list-style-type: none"> • Perform the tests for the detection of simple sugars in the given solutions 	1 skill lab	OSPE/VIVA
42.	Carbohydrates	Biochemistry	<ul style="list-style-type: none"> • Perform the tests for the detection of complex carbohydrates in the given solutions 	1 skill lab	OSPE/VIVA
43.	Elbow joint & Radioulnar joints	Anatomy	<ul style="list-style-type: none"> • Identify the component parts of elbow joint • Enumerate the factors contributing towards its stability • Enumerate the muscles performing various movements at elbow joint • Describe the anastomosis around elbow joint • Identify the superior & inferior radioulnar joints 	1 SGD	OSPE/VIVA
44.	Bones of the wrist and hand & wrist joint	Anatomy	<ul style="list-style-type: none"> • Identify and enumerate the bones of the wrist and hand • Identify their shape and special features • Identify the structures forming the wrist joint • Enumerate the muscles 	1 SGD	OSPE/VIVA

			responsible for producing movements at wrist joint		
45.	Cardiac muscle, properties of heart as a pump and functions of heart valves	Physiology	<ul style="list-style-type: none"> Describe the properties of heart as a pump Describe the functions of heart valves 	2 LGIS	MCQ
46.	Rhythmical excitation of heart-cardiac impulse	Physiology	<ul style="list-style-type: none"> Describe the process of Rhythmical excitation of heart- cardiac impulse Describe its propagation 	1 LGIS	MCQ
47.	Cardiac cycle	Physiology	<ul style="list-style-type: none"> Describe the cardiac cycle 	3 LGIS	MCQ
48.	Electrocardiographic interpretation and vectoral analysis	Physiology	<ul style="list-style-type: none"> Describe the Electrocardiographic interpretation of cardiac cycle and its vectoral analysis 	2 LGIS	MCQ
49.	Cardiac arrhythmias and their ECG interpretation	Physiology	<ul style="list-style-type: none"> Classify Cardiac arrhythmias and comment on their ECG interpretation 	2 LGIS	MCQ
50.	Structure and importance of Glycogen and Cellulose	Biochemistry	<ul style="list-style-type: none"> Describe the structure of Glycogen and its biological significance. Narrate the structure of cellulose and its significance. Comment on the Pathological condition related to glycogen. 	1 LGIS	MCQ
51.	Muscles of hand	Anatomy	<ul style="list-style-type: none"> Classify small muscles of hand Identify muscles in each layer Define the movements produced by small muscles Describe the mode of insertion of long tendons into phalanges 	2 SGD/ Dissection	OSPE/VIVA
52.	Palmar aponeurosis	Anatomy	<ul style="list-style-type: none"> Describe palmar aponeurosis Describe fascial compartments in hand 	1 LGIS	MCQ

53.	Vessels & nerves in the hand	Anatomy	<ul style="list-style-type: none"> Describe the formation of dorsal digital & superficial and deep palmar arches Describe the mode of blood supply to the digits 	1 SGD/ Dissection	OSPE/VIVA
54.	Cutaneous nerves & dermatomes in the upper arm	Anatomy	<ul style="list-style-type: none"> Identify the dermatomes in the upper limb Enumerate the cutaneous nerves in the upper limb 	1 skill lab	OSPE/VIVA
55.	Surface Anatomy of upper limb	Anatomy	<ul style="list-style-type: none"> Identify the bony land marks in the shoulder region, arm, fore arm and hand Mark the course of major vessels and nerves in the upper arm 	1 SGD/ Dissection	OSPE/VIVA
56.	Development of axial skeleton	Anatomy	<ul style="list-style-type: none"> Describe the initial events during development of axial skeleton 	1 LGIS	OSPE/VIVA
57.	Clinical importance of glycosamioglycans	Biochemistry	<ul style="list-style-type: none"> Describe glycosamioglycans Describe the disorders linked with GAGs 	1 LGIS	MCQ
58.	General features of vertebrae & Spinal column as a whole	Anatomy	<ul style="list-style-type: none"> Describe the general features of a vertebra Describe the shape, curves, contents and abnormalities of vertebral column 	1 skill lab	OSPE/VIVA
59.	Ligaments and joints of the spinal column	Anatomy	<ul style="list-style-type: none"> Briefly comment on the ligaments, joints and important muscles in relation to vertebral column 	1 SGD/ Dissection	OSPE/VIVA
60.	Muscles supporting the back	Anatomy	<ul style="list-style-type: none"> Comment on the Anatomy of important muscles which are supporting the back, in relation to vertebral column 	1 SGD/ Dissection	OSPE/VIVA
61.	Macrominerals	Biochemistry	<ul style="list-style-type: none"> Define Macrominerals Enlist sources of Calcium, Phosphorus and Magnesium Discuss absorption and biochemical functions of Calcium Describe regulation of Calcium levels in blood Describe absorption, biochemical functions of Phosphorus and magnesium 	1 LGIS	MCQ

			<ul style="list-style-type: none"> • Discuss the causes, risk factors and clinical manifestations of diseases related to Calcium, phosphorus and Magnesium 		
62.	Development of the vertebral column	Anatomy	<ul style="list-style-type: none"> • Describe the development of vertebral column 	1 LGIS	MCQ
63.	Development of the appendicular skeleton	Anatomy	<ul style="list-style-type: none"> • Describe the development of appendicular skeleton 	1 LGIS	MCQ
64.	Microminerals	Biochemistry	<ul style="list-style-type: none"> • Define Microminerals • Enlist sources of Iron, copper, Iodine, Selenium, Flouride and molybdenum • Discuss Storage, transport and excretion of Iron • Describe absorption and biochemical function of Iron, Copper, Iodine, Selenium, Fluorides and molybdenum • Discuss the causes, risk factors and clinical manifestation of diseases related to Iron, Copper, Iodine, Selenium, Fluorides and molybdenum 	1 LGIS	MCQ
65.	Spinal Deformities, Spinal Trauma and Clinical conditions of Spine	Surgery	<ul style="list-style-type: none"> • Differentiate between three major spinal injuries and three common clinical conditions of Spine • Identify Radiological Findings of five common Spinal Injuries and five common deformities 	LGIS	MCQ
66.	NSAIDs	Pharmacology	<ul style="list-style-type: none"> • Classify NSAIDs • Describe their therapeutics • Enlist Adverse effects 	1 LGIS	MCQ

Learning Resources:

Anatomy

Text Books

1. Regional Anatomy by Snell
2. Embryology by Langman's
3. Snell's Neuro Anatomy
4. Histology by Janquira
5. General Anatomy by Laique Hussain

Reference Books:

6. Clinical Anatomy by Keith L. Moore
7. Histology by Laique Hussain
8. Histology by Difiore
9. Student Gray's
10. Embryology by Keith L. Moore

Physiology

11. Text Book of Medical Physiology by Guyton & Hall
12. Physiology by Lippincott

Biochemistry

13. Lippincott Biochemistry.
14. Harper's Biochemistry
15. Mushtaq Biochemistry

Pathology

16. Pathologic Basis of Disease by Robbins and Cotran.

Pharmacology

17. Lippincott pharmacology.
18. Katzung Pharmacology. Biochemistry

Behavioral Sciences

19. Introduction to Psychology by Edward. E Smith.
20. Behavioral Science by Lippincott Williams.

Community Medicine

21. Text book of Preventive and Social Medicine by JE. Park

Medicine

22. Davidson's Text book of Medicine

Surgery

23. Text book of Surgery by Bailey & Love
24. Text book of Radiology by Christson



**FOR ENQUIRIES CONTACT:
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