

CURRICULUM OF ANATOMY

MBBS COURSE

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INTRODUCTION

The basic sciences subject will be covered during first and second year. Anatomy is taught with its clinical application and use in clinical subjects. Due to nature of this subject educational strategies of diverse approaches are employed. Educational resources like videos, biological specimens, microscopy slides, books and journals are used to learn this diverse subject. Early clinical exposure is used for clinical application of anatomy.

First year and second year are divided in three educational terms which conclude at with formative assessment test. End of year is University exam for summative assessment.

EDUCATIONAL HOURS

Year	Theory	Practical	Total
1st year	150 hours (100 Lecture, 50 SGD / PBL)	150 hours	300
2nd year	150 hours (100 Lecture, 50 SGD / PBL)	150 hours	300
Total	300 hours in 36 weeks/year	300 hours	600 hours
Strategy	Lectures Problem based learning Small group discussion Case based discussion	Laboratory session Microscopy sessions Dissection sessions Clinical sessions Audio video sessions	

LEARNING OUTCOMES

AT THE END OF CURRICULUM STUDENT WILL BE ABLE TO

- To explain various anatomical terms.
- To distinguish different anatomical landmarks.
- To discuss principles of General Anatomy.
- To demonstrate ability to mark structure of surface anatomy.
- To identify anatomical parts on models and cadavers.
- To explain the anatomical principles of different clinical methods.
- To identify different cellular structures & tissue on microscopic slides.
- To describe different parts & relationships of Anatomical structures.
- To explain the clinical application of knowledge of Anatomy.
- To describe steps of development of embryo and other human organs.
- To discuss various developmental anomalies.

EDUCATION STRATEGIES

The educational strategies in this curriculum are multiple and aligned with domain of learning and according to the desired outcome

Didactic lectures

One-third of the curriculum will be delivered in a traditional didactic format including PowerPoint presentations and case discussions. Didactic education is considered to be a one-way transmission of material from teacher to learner, we cannot overlook the possibility of meaningful interaction between experts and learners during live lectures. This type of interaction, which allows for immediate clarification of concepts and extension of knowledge, may be particularly important for novice learners who have relatively little exposure to the subject matter, such as our study population.

Problem based learning

A lot of emphasis is on case based discussion. Problem-based learning (PBL) is complex and heterogeneous. A wide variety of educational methods are referred as PBL. These include Lecture-based case, Case based lecture, Case based discussions, Problem or inquiry based and Closed loop or reiterative. Incorporation of case based discussion in teaching enhances the critical thinking and problem-solving skills. It also helps in developing a broader prospective of clinical case scenarios.

Small Group Discussion

Small group discussion provides a unique environment to achieve high standards in medical education. Activation of prior knowledge, exchange of ideas, and engagement at a higher cognitive level are assumed to result in deeper learning and better academic achievements by students.

Video sessions

Anatomy is a subject which involves visual learning and formulating concepts. Video assisted learning sessions also provides opportunities to learn gross anatomy.

Laboratory Sessions

Laboratory sessions are important as they provide opportunity for experiential learning in terms of study of slides and identification of tissues

Early clinical Exposure (ECE)

Clinical skills session are important part of curriculum to achieve psychomotor and affective outcomes. This provide opportunity for medical students in early years and will stimulate contextual learning.

ASSESSMENT

MCQ's and SEQ's

Multiple choice question and short essay question test will be used at the end of part of curriculum to assess the learning of knowledge. These all assessment exercises will be formative. The written tests like Multiple-Choice Questions (MCQs) and Short-Essay Questions (SEQs) test formats are used for the assessment of cognitive domain. The MCQs are more objective and essentially select type of item response format. MCQs have a cueing effect, which promotes guessing and leads to higher scores. In addition, writing MCQs of higher cognitive level of problem solving is challenging. On the contrary, the SEQs are more subjective and have a supply or construct type item response format, which does not have any cueing effect and can effectively assess problem solving skills.

OSPE

Short case and OSCE will be used to evaluate clinical skills and procedural skills at the ward end of placement. The OSCE is a method of clinical skill assessment, and it has been reported to be appropriate for assessing learning achievement levels in the psychomotor and emotional domains, which are difficult to evaluate with written examinations.

Viva Voce

Viva voce is used for assessment of knowledge and problem solving ability of students. This method is useful evaluating cognitive domain.

Assignments

Students of different year will be given assignment of different nature such as research and literature search and surveys

INTERNAL ASSESSMENT

- i. The weightage of internal assessment shall be 10% of totals marks.
- ii. Continuous internal assessment shall consist of evaluation at the end of each assignments, e.g. stages/sub-stage, class tests etc., attitudinal assessment from educational supervisors.
- iii. Assessment of knowledge, Skills and Attitude shall contribute toward internal assessment. Methods used to assess these domains shall include Multiple Choice Questions of one-best type, Short essay questions, Oral/Viva, and Practical/Examinations.
- iv. The score of internal assessment shall contribute to the score in the, Final university examination of each subject contributing 90 to total score, and the candidate shall pass in aggregate.
- v. Proper record of continuous internal assessment shall be maintained.

LEARNING RESOURCES

The department of Anatomy will require following resources for implementation resources:

- Human resource
- Instructors (faculty members)
- Curriculum coordinator curriculum secretary
- Infrastructure
- Lecture hall with AV aids
- Tutorial room with AV aids
- Dissection Hall and Museum with Anatomy Models
- Histology Lab with Pool of slides
- Simulated patients and simulated manikins
- Computers

LISTS OF CONTENT RESOURCES

- General Anatomy by Prof. Sadiq Hussain Siddiqui
- Medical Histology by Prof. Laiq Hussain Siddiqui
- Di-Fiore Atlas of Histology
- Clinically Oriented Anatomy by Keith L. Moore.
- Cunningham's Manual of Practical Anatomy by G.J. Romanes, 15'h Ed., Vol-I, II, III.
- Clinical Anatomy by Richard S. Shield.
- Wheater's Functional Histology
- Basic histology by Junqueira and Carniero
- Grant's Atlas of Anatomy
- Langman's embryology
- The Developing Human. Clinically Oriented Embryology by Keith L. Moore, 6'h Ed.
- Neuroanatomy by Richard S. Snell.
- Gray's Anatomy Latest Edition.
- Clinical Anatomy by R.J. Last, Latest Ed.

CONTENTS MODULES

S.No	Topic
1	Module 1 Skeletal system - general anatomy
2	Module 2 Circulatory system – general anatomy
3	Module 3 Nervous System- general anatomy
4	Module 4 Skin and Fascia – general anatomy
5	Module 5 Common diagnostic techniques
6	Module 6 Upper Limb - gross anatomy
7	Module 7 Lower Limb - gross anatomy
8	Module 8 Thorax - gross anatomy
9	Module 9 Applied Anatomy of upper limb, lower limb and thorax
10	Module 10 General Embryology
11	Module 11 General Histology
12	Module 12 Neuroanatomy
13	Module 13 Head and neck
14	Module 14 Abdomen and Pelvis
15	Module 15 Systemic Histology
16	Module 16 Special Embryology

IMPLEMENTATION

The curriculum will be spread over 2 year with 36 working weeks each year. During this period student will be exposed to various education strategies to achieve the learning objectives.

1st Year.

In this year student will be exposed to do dissection, histology lab, Museum and early clinical exposure to develop understanding of anatomy and its applied aspects.

Theory (Lecture, SGD and PBL)	Practical (Early clinical exposure, Histo-Lab, Museum)
150 Hours (36 Weeks)	150 Hours

2nd Year.

In this year student will be exposed to do dissection, histology lab, Museum and early clinical exposure to develop understanding of anatomy and its applied aspects.

Theory (Lecture, SGD and PBL)	Practical (Early clinical exposure, Histo-Lab, Museum)
150 Hours (36 Weeks)	150 Hours

First Year			
	First term	Second term	Third term
Gross anatomy	Module 6 Upper Limb	Module 7 Lower Limb	Module 8 Thorax
Histology	Module 11 General Histology Cell Epithelium Connective Tissue	Module 11 General Histology Bone and Cartilage Muscle and Nerves System	Module 11 General Histology Lymphatic system and vascular system. Skin and glands Respiratory system
Embryology		Module 10 General Embryology Upto 4th week of development	Module 10 General Embryology Teratology Multiple pregnancies Skin and glands
General Anatomy	Module 1 Module 2 Module 3 Module 4 Module 5		
Assessment			

Second Year			
	First term	Second term	Third term
Gross Anatomy	Module 12 Neuro Anatomy	Module 13 Head and Neck	Module 14 Abdomen and Pelvis
Histology	Module 15 Systemic Histology Nervous System Special Senses Endocrine Gland	Module 15 Systemic Histology GIT	Module 15 Systemic Histology Gland Associated with GIT Genitourinary System
Embryology	Module 16 Special Embryology Nervous System Special Senses Face, Tongue, Thyroid Gland Para Thyroid Gland, Thymus Branchial Apparatus	Module 16 Special Embryology Eye, Ear, Face, Palate Pituitary Gland Body Cavity Diaphragm GIT	Module 16 Special Embryology CVS Genitourinary system Respiratory system
General Anatomy			
Assessment			

PROGRAMME EVALUATION

Purpose of Evaluation

The major goals of the evaluation are to provide information that the students can use to achieve curricular objectives and that the faculty can use to monitor quality of and improve curriculum.

Design of Evaluation

The evaluation design as only posttest.

Users of evaluation: students, curriculum faculty, Principal Office

Resources: Curriculum faculty and departmental secretaries. No additional funding

Evaluation question:

- What percentage of students achieved 75% mandatory attendance?
- What percentage of students achieved pass marks in university exam?
- What are the strengths of the curriculum? What are the weaknesses? How can the curriculum can be improved?

Because of limited resources, the evaluation was kept simple. Data Collection was integrated into the curriculum schedule. The major goals of the evaluation are to provide information that the students can use to achieve curricular objectives and that the faculty can use to monitor quality of and improve curriculum. The evaluation design as only posttest.

End of curriculum evaluation form:

This will be filled by students and faculty members for evaluation of adequacy with each content was covered, whether they would recommend the curriculum to others and written comments on curriculum strengths, weaknesses and suggestions for improvements.

Annual Report:

Based on evaluation of the educational programe report will be generated annually and submitted to Medical Educational Department.

1ST PROFESSIONAL (PART-1) ANATOMY INCLUDING HISTOLOGY

TABLE OF SPECIFICATION (ToS)			
General Anatomy	Anatomical Term and Sectional Planes of the Body	1	One In reference to Upper and lower Limbs
	Skeletal System	1	
	Joints	1	
	Muscles	1	
	Circulatory System (a) Cardio Vascular (b) Lymphatic System	1	
	Nervous System	1	
	Skin and Fasciae	1	
	Diagnosis Techniques	1	
Histology	Cell	1	1
	Epithelium	1	
	Connective Tissue (a) Bones (b) Cartilage (c) Connect Tissue Proper	2	
	Muscular Tissue	1	
	Nervous Tissue, Skin and mammary Gland	1	
	Lymphoid Organs	1	
	Vascular System	1	
	Respiratory System	1	
Embryology	Cell Divisions (mitosis and meiosis) and Gametogenesis	1	1
	Fertilization, Development 1-2 weeks	1	
	Development 3-8 weeks	1	
	Fetal Period and Teratogenesis	1	
	Fetal membranes and Placenta	1	
	Multiple Pregnancies and diagnostic procedures	2	
	Development of Muscular system, skeletal system and limbs	1	
	Development of skin, appendages and mammary glands	1	
Upper Limb	Pectoral Region, Shoulder region, Axilla	1	1
	Arm	2	
	Forearm	2	
	Hand	1	
Lower Limb	Gluteal region	1	1
	Thigh	2	
	Leg	2	
	Foot	2	
Thorax	Heart	1	1
	Lung	1	
	Pericardium / Pericardial Sec	1	
	Pleural, Pleural Cavity	1	
	Thoracic Wall, Joints, Bones and Diphragm	1	
	Intercostals, Space and contents	1	
	Mediastinum and its contents	1	
Total		45	9

- 25% MCQ,s and SEQ,s should be clinical oriental or problem based
- In each limb, an equal distribution should be practiced for the following tissues
 - Skin
 - Muscles
 - Bones
 - Connective Tissue sheathes
 - Joints
 - Nerves
 - Vessels
- SEQs of general anatomy may be asked in reference to uppar and lower limb

1ST PROFESSIONAL PART (1)

OSPE GROSS ANATOMY, RADIOLOGICAL ANATOMY 7 EMBRYOLOGY

Gross & Radiological Anatomy and Embryology.

1. Total No. of stations 12, each station will have 02 marks and 04 spots of identification.
2. Each station shall be given 1.5 min.
3. Total marks shall be 24.

Gross Anatomy of upper Limb, Lower Limb, Thorax, Radiological Anatomy & Embryology

OSPE				
Sr.	Region area	Station No.	No of Spots	Marks each Station
1	Upper Limb	01	04	02
	Upper Limb	02	04	02
	Upper Limb	03	04	02
2	Lower Limb	04	04	02
	Lower Limb	05	04	02
	Lower Limb	06	04	02
3	Throax	07	04	02
	Throax	08	04	02
4	Radiological Anatomy	09	04	02
5	Embryological	10	04	02
	Embryological	11	04	02
	Embryological	12	04	02
	Total	12	48	24

HISTOLOGY OSPE AND VIVA

1. There shall be 10 slides fixed on 10 microscopes.
2. They will move from one to the next slide in a predetermined direction.
3. For each station one minutes shall be given, students will give point/points of identification for each slide
4. Total number of identifications spots 10
 - a. Each spots will be given 01 mark (0.5marks for identification and 2 points of identification, 0.25 marks each)
 - b. Total marks allocated shall be: 10
5. Time consumed shall be 10min.
Long Slide (Total Marks 10):
6. Time 15 minutes will be given for
Identification: 1 mark, Drawing: 1 mark, Labeling: 1 mark
Interactive Examination long Slide: 7 marks

ANATOMY STRUCTURED VIVA

ANATOMY STRUCTURED VIVA			
Sr no.	Contex Area	Marks Allocated	Minimum number of Question
1	Surface marking	04	01
2	Upper limb	10	02
3	Lower limb	10	02
4	Thorax	10	02
5	Embryology	12	03
	Total	46	10

Note:

Material for the examination shall be the responsibility of the Department/ College which should be put in place well before the time of the examination. Examination space and facilities shall be evaluated by the external examiner who will make sure that the movements of the candidate are well organized t maintain the transparency of the procedure.

1ST PROFESSIONAL (PART-2) ANATOMY INCLUDING HISTOLOGY

TABLE OF SPECIFICATION (ToS)			
Histology	Digestive System	1	1
	Urinary System	1	
	Nervous System	1	
	Male Reproductive System	1	
	Female Reproductive System	1	
	Endocrine glands	1	
	Special Senses (Eye and Ear)	1	
Embryology	Body Cavities, mesenteries and diaphragm	1	1
	Respiratory System	1	
	Cardiovascular System	2	
	Nervous System, Eye, Ear	1	
	Urinary System	1	
	Male reproductive System	1	
	Female reproductive System	1	
	Digestive System	1	
	Pharyngeal Apparatus and face	1	
Brain	External and internal structure of brain	2	1
	External and internal structure of spinal cord	2	
	Cranial nerves, muscle and their intracranial course	1	
	Blood supply of brain and spinal cord	1	
	Meanings, Cisterns, Ventricles	1	
Pelvis	Pelvic Wall. Pelvic diaphragm, Pelvic peritoneum	1	1
	Pelvic Viscera & Structure	1	
	Perineum, urogenital diaphragm	4	
Abdomen	Abnormal Wall	2	1
	Peritoneum	1	
	Abnormal Viscera & other Structure	2	
Head and Neck	Cranial cavity, Skull & Certebrae & Joints of nick	2	1
	Scalp, Temple & face	1	
	Side of neck & Triangles, Back of neck, Cervial fascia	2	
	Cranial nerves and ganglia	2	
	Orbit, Eyeball, Ear	1	
	Parotid. Temporal. Infrtemandibular regions	2	
	Mouth, Pharynx, Tongue	2	
	Nasal Cavity and Larynx	1	
		Total	

- In each gross region of body, an equal distribution should be practiced for the following tissues:
 - Skin
 - Muscles
 - Bones
 - Connective tissue sheathes
 - Joints
 - Nerves
 - Vessels
- 25% MCQs and SEQs should be clinical-oriented or problem based.

1ST PROFESSIONAL PART (2)

OSPE GROSS ANATOMY, RADIOLOGICAL ANATOMY 7 EMBRYOLOGY

Gross Anatomy

1. Total No. of station 12, each station will have 02 marks and 04 spots of identification.
2. Each station shall be given 1.5 min.
3. Total marks shall be 24.

Time per station: 1.5 minutes (18 minutes)

OSPE				
Sr.	Region / Area	Station No.	No of Spots	Marks each Station
1	Head & Neck	01	04	02
	Head & Neck	02	04	02
	Head & Neck	03	04	02
2	Abdomen	04	04	02
	Abdomen	05	04	02
	Abdomen	06	04	02
3	Pelvis	07	04	02
4	Brain	08	04	02
	Brain	09	04	04
5	Radiological Anatomy	10	04	02
6	Special Embryology	11	04	02
	Special Embryology	12	04	02
	Total	12	48	24

Arrangement of OSPE in Histology:

1. Histology practical Examination shall also be used to cover nearly all areas of the subjects.
2. Histology long slide and viva shall be arranged simultaneously on the same day.

Histology OSPE and VIVA (Total Marks 20)

There shall be 10 slides fixed on 10 microscopes.

1. They will move from one to the next slide in a predetermined direction.
2. For each station one minutes shall be given, students will give point/points of identification for each slide. (Annexure B0).
3. Total number of identification spots.
 - a. Each spots will be given
01 mark (0.5 marks for identification and 2 points of identification, 0.25 mark each)
 - b. Total marks allocated shall be:
4. Time consumed shall be 10 min. Long Slide (Total Marks 10)
5. Time: 15 minutes will be given for

Identification: 1 mark, Drawing: 1 mark, Labeling: 1 mark

Interactive Examination Long Slides: 7 marks

ANATOMY STRUCTURED VIVA

ANATOMY STRUCTURED VIVA			
Sr no.	Contex Area	Marks Allocated	Minimum number of Question
1	Surface marking	04	01
2	Head and Neck	10	02
3	Brain and Spinal cord	08	02
4	Abdomen	10	02
5	Pelvis	04	01
6	Special Embryology	10	02
	Total	46	10

Note:

Material for the examination shall be the responsibility of the Department/ College which should be put in place well before the time of the examination. Examination space and facilities shall be evaluated by the external examiner who will make sure that the movements of the candidate are well organized t maintain the transparency of the procedure.

Contents	Objectives	Domain	Strategy	Assessment
Module 3: Nervous System- general anatomy				
Nervous tissue Somatic system Autonomic system Spinal nerve Plexus Pain pathway	<ul style="list-style-type: none"> Name different components of nervous tissue (neuron, ganglion, nuclei, nerve, tracts) Define and classify different types of nervous system (Somatic and Autonomic) Enumerate different parts of somatic nervous system, their morphology and functions (central nervous system and peripheral nervous system). Describe the formation and distribution of a typical spinal nerve. Discuss the nerve plexus formation; define dermatomes and give their clinical importance. Enumerate and describe different parts of autonomic nervous system and their functions (sympathetic nervous system and parasympathetic nervous system). Define and comprehend reflex, reflex arc and referred pain. 	C2 C2 C3 C3 C3P2 C3 C3	Lecture Lecture Lecture SGD SGD SGD SGD	MCQ MCQ MCQ SEQ SEQ MCQ SEQ
Module 4: Skin and Fascia – general anatomy				
	<ul style="list-style-type: none"> Name different types of skin and mention its components (dermis and epidermis). Enumerate its appendages and give their function (hair, nail, erector pili muscles, sebaceous and sweat glands). Comprehend and describe the structure and function of superficial and deep fasciae including retinaculæ and septae. Describe the skin lines and their significance. Give clinical significance of discolouration of skin (Jaundice, cyanosis and anemia). 	C3 C3 C3 C3 C3 C3P2A2	Lecture Lecture Lecture Lecture CBD	MCQ MCQ MCQ MCQ OSCE
Module 5: Common diagnostic techniques				
	<ul style="list-style-type: none"> Interpret normal radiographs of different regions of the body. Identify displacement of the fracture segments of the bone. Diagnose dislocation of the joints. Understand and interpret ultra-sonographs of abdominal viscera. Understand principle of CT scan and interpret the normal scans. Comprehend MRI and interpret normal images of different diagnosis techniques i.e. X-rays and CT scans, MRI and Ultra-sonography. Take the Biopsy and prepare it for examination. 	C3 C3 C3 C3 C3 C3 C3 C3P2A2	SGD SGD SGD SGD SGD SGD SKILLS LAB	OSCE OSCE OSCE OSCE OSCE OSCE OSCE

Contents	Objectives	Domain	Strategy	Assessment
Module 6: Upper Limb - gross anatomy				
Shoulder joint and axilla Arm and elbow joint Bones of shoulder girdle Cubital fossa Forearm and wrist joint Bones of fore arm Hand and joints of hand Applied anatomy of upper limb	<ul style="list-style-type: none"> Develop an expertise in identification of structures in a cadaver Develop clear concepts of the topographic anatomy of the regions. Understand muscle attachments, their actions, nerve supply and effect of paralysis occurring in groups and important individual muscles Develop concept structure and mechanism of joints and the clinical conditions involving them. Understand bones of the appendicular skeleton, their general and special features Recognize and describe the bones of the foot and hand individually, in articulation and in skiagrams. Develop clear concept about common fractures of the bones, displacement of their fragments and, factors causing it. Understand nerve plexuses of limbs, their normal variations and different clinical conditions related to them. Understand different kinds of injuries to the important nerves of the extremities, the ways these injuries are produced, their effects and clinical tests to diagnose the conditions. Recognize important superficial veins and their clinical uses. Understand anatomical relevance to important clinical conditions in the regions. Understand the scheme of regional lymphatic drainage and vascular supply. Interpret normal skiagrams, C.T. Scans, MRI and Ultrasound. 	C3 C3 C3P2 C3 C3 C3 C3 C3P2 C3P2 C3 C3P2 C3P2 C3P2 C3P2	Dissection SGD SGD SGD SGD SGD SGD SGD SGD SGD SGD SGD SGD SGD SGD	MCQ MCQ SEQ SEQ MCQ MCQ SEQ SEQ SEQ/MCQ OSCE MCQ/SEQ MCQ/SEQ OSCE

Contents	Objectives	Domain	Strategy	Assessment
Module 7: Lower Limb - gross anatomy				
Hip joint and thigh Back of thigh and knee Bones of thigh and pelvic girdle popliteal fossa leg and ankle joint Bones of leg foot and joints of foot Applied anatomy of lower limb	<ul style="list-style-type: none"> Develop an expertise in identification of structures in a cadaver Develop clear concepts of the topographic anatomy of the regions. Understand muscle attachments, their actions, nerve supply and effect of paralysis occurring in groups and important individual muscles Develop concept structure and mechanism of joints and the clinical conditions involving them. Understand bones of the appendicular skeleton, their general and special features Recognize and describe the bones of the foot and hand individually, in articulation and in skiagrams. Develop clear concept about common fractures of the bones, displacement of their fragments and, factors causing it. Understand nerve plexuses of limbs, their normal variations and different clinical conditions related to them. Understand different kinds of injuries to the important nerves of the extremities, the ways these injuries are produced, their effects and clinical tests to diagnose the conditions. Recognize important superficial veins and their clinical uses. Understand the mechanism by which the blood is pumped from lower limb and anatomical factors which predispose to development of varicose veins. Understand anatomical relevance to important clinical conditions in the regions. Understand the scheme of regional lymphatic drainage and vascular supply. Interpret normal skiagrams, C.T. Scans, MRI and Ultrasound. 	C3 C3 C3P2 C3 C3 C3 C3P2 C3P2 C3 C3P2 C3P2 C3P2 C3P2 C3P2 C3P2	Dissection SGD	MCQ MCQ SEQ SEQ MCQ MCQ SEQ SEQ SEQ/MCQ OSCE MCQ/SEQ MCQ/SEQ OSCE OSCE
Module 8: Thorax - gross anatomy				
Bony skeleton of thorax Thoracic viscera Great vessels of thorax Applied anatomy of thorax	<ul style="list-style-type: none"> Develop an understanding of the topographic anatomy of the region and describe it. Understand and describe the anatomy of the bony thorax and costo-vertebral and other joints of thorax and the mechanism of respiration. Understand and mark the important thoracic viscera and pleural reflections on the surface of the body. Understand the importance of percussion notes in eliciting the extent of resonant and non-resonant viscera and their clinical importance. Give a precise account of the Anatomy of thoracic viscera, muscles, nerves, blood vessels and fasciae of the region and correlate anatomical information to common clinical conditions. Understand and describe the scheme of the regional lymphatic drainage and lymph nodes. Interpret normal skiagram, CT scan, MRI and other diagnostic techniques. 	C3 C3 C3/P2 C3/P2 C3 C3/P2 C3/P2	SGD SGD	MCQ/SEQ MCQ/SEQ

Contents	Objectives			Domain	Strategy	Assessment
Module 9: Applied Anatomy of upper limb, lower limb and thorax				C3P2		MCQ/SEQ
	<ul style="list-style-type: none"> • Describe clinical effects of nerve injuries of the upper and lower limbs • Explain the anatomical aspects of fracture of bones of upper and lower limbs (clavicle, humerus, radius, ulna, femur, tibia, fibula, scaphoid) and ribs • Explain the anatomical aspects of dislocation of joints of limbs • Describe anatomical basis of contracture, ganglia, pulp infection, carpal tunnel syndrome • Explain the anatomical basis of femoral hernia, varicose veins, bursitis and lymphadenitis • Describe anatomical basis of spread of carcinoma breast • Explain clinical importance of coronary circulation with reference to angina and myocardial infarction • Define cardiac tamponade, pericarditis and paracentesis in relation to anatomical aspects • Define pleural effusion, pleurisy, pleural tap, pneumothorax, hydrothorax, haemothorax, pneumonia, bronchogenic carcinoma, foreign body in airways in relation to anatomical aspects 			C3 C3 C3 C3 C3 C3 C3 C3 C3	SGD SGD SGD SGD SGD SGD SGD SGD SGD SGD	MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ

Contents	Objectives	Domain	Strategy	Assessment
Module 10: General Embryology				
	<ul style="list-style-type: none"> Comprehend and describe the process of cell division (mitosis and meiosis) and gametogenesis. Understand and describe ovarian and menstrual cycle. Understand and describe fertilization, cleavage, blastocyst formation and implantation of the embryo (first week of development). Comprehend and describe stages of early embryonic development in second and third week of intrauterine life. Understand and describe development of embryo (4th-8th week of development). Comprehend and describe fetal period (9th week to birth). Define and describe fetal structures (amnion, chorion, yolk sac, allantois and umbilical cord) Comprehend and describe formation of placenta, its structure and anomalies. Understand and describe the basis of multiple pregnancies. Understand and describe procedures for assessment of fetal status. Define clinical correlates i.e. anovulatory cycles, semen analysis and abnormal sites of implantation. Understand In-Vitro Fertilization (IVF), assisted in-vivo fertilization. Describe the rationale of choriocarcinoma, pregnancy test, sacro coccygeal teratoma, hydatidiform mole. Understand the check points of estimation of gestational age and viability of fetus. Understand the basis of intrauterine growth retardation, hydramnios, twin transfusion syndrome, conjoined twins, umbilical cord length variation, and amniotic bands. Define teratogenesis and name common teratogens. Describe the development of Integumentary system including manubry gland and their anomalies. Describe the development of limbs and vertebral column including their anomalies. Understand and describe the development of muscular system and their anomalies. Understand and describe the structural and numerical chromosomal anomalies i.e. Klinefelter syndrome, Turner's syndrome, Super-female, Down's syndrome, Polyploidy. 	<p>C3</p> <p>C3 C3</p> <p>C3</p> <p>C3 C3 C3</p> <p>C3 C3 C3 C3</p> <p>C3 C3</p> <p>C3 C3</p> <p>C3 C3</p> <p>C3 C3</p> <p>C3 C3</p> <p>C3 C3</p>	<p>Lecture</p> <p>Lecture Lecture</p> <p>Lecture</p> <p>Lecture Lecture SGD</p> <p>SGD SGD SGD SGD</p> <p>SGD SGD</p> <p>SGD SGD</p> <p>Lecture Lecture</p> <p>Lecture Lecture Lecture Lecture</p>	<p>MCQ/SEQ</p> <p>MCQ/SEQ MCQ/SEQ</p> <p>MCQ/SEQ</p> <p>MCQ/SEQ MCQ/SEQ MCQ/SEQ</p> <p>MCQ/SEQ MCQ/SEQ MCQ/SEQ</p> <p>MCQ/SEQ MCQ/SEQ</p> <p>MCQ/SEQ MCQ/SEQ</p> <p>MCQ/SEQ MCQ/SEQ</p> <p>MCQ/SEQ MCQ/SEQ MCQ/SEQ MCQ/SEQ</p>

Contents	Objectives	Domain	Strategy	Assessment
Module 11: General Histology				
Cell	Enumerate and describe structure of different components of cell	C3	SGD/LAB	MCQ/OSPE
Epithelium	Classify the basic tissues of the body.	C3	SGD/LAB	SEQ
Conne- tive tissue	Classify and describe different types of epithelia with examples.	C3	SGD/LAB	MCQ/OSPE
	Comprehend and describe surface modification of plasmalemma (intercellular junctions, microvilli, cilia, stereocilia, basal striations).	C3	SGD/LAB	SEQ
Bone and cartilage	Define, classify and describe different types of connective tissue proper with examples.	C3	SGD/LAB	MCQ/OSPE
	Comprehend and describe the structures of connective tissue cells, fibers and ground substance.	C3	SGD/LAB	MCQ/OSPE
Muscle	Classify and describe different types of cartilages with examples.	C3	SGD/LAB	MCQ/OSPE
	Classify bones from histological point of view (spongy and compact), and describe their microscopic structure.	C3	SGD/LAB	SEQ
Nerve	Comprehend and describe histogenesis of bone (intramembranous and intracartilagenous).	C3	SGD/LAB	MCQ/OSPE
Lymph	Classify and describe light and electron microscopic structure of muscles (smooth, cardiac and skeletal).	C3	SGD/LAB	MCQ/OSPE
	Classify and describe the structure of neuron, neuroglial cells and nerve fibre	C3	SGD/LAB	SEQ
Vessels	Describe microscopic structure of lymphoid organs (lymph node, spleen, tonsils and thymus) and give their functions.	C3	SGD/LAB	MCQ/OSPE
	Classify and describe different sub-division of vascular system.	C3	SGD/LAB	MCQ/OSPE
Skin and glands	Understand and describe microscopic structure of different types of blood vessels.	C3	SGD/LAB	MCQ/OSPE
	Describe microscopic structure of skin and its appendages (hair follicle, sebaceous and sweat glands) and give their functions.	C3	SGD/LAB	MCQ/OSPE
Respiratory system	Understand and describe the microscopic structure of mammary gland in different functional stages.	C3	SGD/LAB	MCQ/OSPE
	Describe the microscopic structure of respiratory system (nasal cavity, epiglottis, trachea, bronchi and lungs) and give the changes in structure correlating these to their functions.	C3	SGD/LAB	MCQ/OSPE
	Define hypertrophy, atrophy, metaplasia, hyperplasia, and anaplasia, neoplasia, necrosis.	C3	SGD/LAB	MCQ/OSPE
	Identify, draw and label light microscopic structures of above mentioned tissues.	C3	SGD/LAB	MCQ/OSPE

Contents	Objectives	Domain	Strategy	Assessment
Module 14: Abdomen and Pelvis				
<ul style="list-style-type: none"> Develop understanding of the topographic anatomy of the regions. Mark the regions of the abdomen on the surface of the body. Mark the abdominal and pelvic viscera on the surface of the body Understand the importance of percussion notes in eliciting the extent of resonant and non-resonant viscera and their clinical importance. Give a description of the Anatomy of the anterolateral and posterior abdominal walls. Understand and give clear description of inguinal canal, different external hernias and their complications. Understand the peritoneum, peritoneal cavity and possible sites of internal hernias along with their clinical features. Comprehend, understand and describe the abdomino-pelvic fasciae and their clinical importance. Give a precise account of the Anatomy of abdominal and pelvic viscera, muscles, nerves and blood vessels of the regions and correlate anatomical information to common clinical conditions.. Understand the clinical effects and apply clinical tests to verify injuries to different nerves of the region. Develop clear concepts of anatomy of normal male and female pelvises, and differences between them. Understand the dimensions of the normal and contracted adult female pelvis and their clinical importance in the mechanism of delivery. Understand the anatomy of the perineal region in both male and female and comprehend the anatomical basis of clinical conditions of the area. Understand anatomical basis of possible birth injuries to the mother in difficult labor and the clinical conditions produced thereafter. Understand the scheme of the regional lymphatic drainage and lymph nodes. Comprehend normal radiological anatomy of the region, CT Scans, MRI, Ultrasound and, other diagnostic techniques. Porto systemic anastomosis, spread of carcinoma stomach, duodenal and peptic ulcer, appendicitis, hemorrhoids, anal fistula, anterior abdominal wall hernias, abdominal incisions, varicocele, hydrocoele, benign prostatic hyperplasia and carcinoma of prostate uterus prolapse 	C3 C3 P2 A2 C3 C3 C3 C3 C3 C3 C3 C3, P2 C3, P2 C3, P2 C3, P2, A2 C3 C3, P2 C3, P2 C3, P2 C3	SGD SGD SGD/video SGD/video SGD SGD/video SGD/video SGD/video SGD/video SGD/PBL SGD/PBL SGD/PBL SGD/PBL SGD SGD/PBL SGD/PBL SGD/PBL SGD	SEQ/MCQ OSCE SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ OSCE SEQ/MCQ OSCE SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ SEQ/MCQ	

Contents	Objectives	Domain	Strategy	Assessment
Module 15: Systemic Histology				
Digestive System:	<ul style="list-style-type: none"> Name and describe the epithelium lining the oral cavity, tongue, gums, hard and soft palate, pharynx and lips and, explain the histology of tongue. 	C3	SGD/ LAB	SEQ/OSCE
Urinary System:	<ul style="list-style-type: none"> Understand and describe the histological structure of oesophagus, stomach, small intestine, large intestine, appendix and anal canal; explain the change in structure of their epithelium in relations to the function. 	C3	SGD/ LAB	SEQ/OSCE
Male and female Reproductive System:	<ul style="list-style-type: none"> Comprehend and describe the histological structure and functions of salivary glands. Understand and describe the histological structure and functions of Liver, Pancreas and Gall Bladder. Comprehend and describe the histological structure of kidney, ureter and urinary bladder, and their functions. 	C3 C3	SGD/ LAB SGD/ LAB	SEQ/OSCE SEQ/OSCE
Endocrine System	<ul style="list-style-type: none"> Comprehend and describe histological structure of testis, epididymis, vas deferens, seminal vesicle and prostate, and relate it to their functions. Understand and describe histological structure of ovaries, fallopian tube, uterus and vagina, and explained their functions related to their structure. Understand and describe the histological structure and functions of the following glands: <ol style="list-style-type: none"> Pituitary Thyroid Parathyroid Adrenal Islets of Langerhans. 	C3 C3 C3	SGD/ LAB SGD/ LAB SGD/ LAB	SEQ/OSCE SEQ/OSCE SEQ/OSCE
Eye and Ear:	<ul style="list-style-type: none"> Understand and describe the histological structure of eyeball with emphasis on cornea and retina, and give their functions related to their structure. 	C3	SGD/ LAB	SEQ/OSCE
Nervous System:	<ul style="list-style-type: none"> Comprehend and describe the Membranous Labyrinth and give the histological structure of different parts; correlate their functions to the structure. Understand and describe the histological structure of spinal cord, cerebellum and cerebrum and correlate it to the functions. Identify, draw and label light microscopic structures of above mentioned tissues. 	C3 C3 C3	SGD/ LAB SGD/ LAB SGD/ LAB	SEQ/OSCE SEQ/OSCE SEQ/OSCE

Contents	Objectives	Domain	Strategy	Assessment
Module 16: Special Embryology				
Head and Neck:	<ul style="list-style-type: none"> Understand and describe the development and derivatives of pharyngeal apparatus (arch, cleft, pouch and membrane). Comprehend and describe the development of tongue. Describe the development of thyroid gland. 	C3	SGD/LEC	SEQ/MCQ
Digestive System,	<ul style="list-style-type: none"> Understand and describe the development of pituitary gland. 	C3	SGD/LEC	SEQ/MCQ
Body Cavities and Diaphragm:	<ul style="list-style-type: none"> Comprehend and describe the development of face and palate. Comprehend and describe the development of the region. Understand different congenital malformations of the region. Understand and discuss the development of the body cavities, mesenteries and diaphragm. Comprehend and describe the development of gastrointestinal tract (fore-gut, mid-gut and hind-gut). 	C3	SGD/LEC	SEQ/MCQ
Respiratory System:	<ul style="list-style-type: none"> Understand and describe the development of liver, pancreas and gall bladder. Understand and describe the development of spleen. 	C3	SGD/LEC	SEQ/MCQ
Cardiovascular System:	<ul style="list-style-type: none"> Understand different congenital malformations of the region. Comprehend and describe the development of upper and lower respiratory passages, and give their congenital anomalies. Describe the development of heart, aortic arches, aorta, superior and inferior vena cavae and portal vein. 	C3	SGD/LEC	SEQ/MCQ
Urinary System:	<ul style="list-style-type: none"> Describe the foetal circulation and changes at birth. Understand and describe the congenital anomalies of cardiovascular system. 	C3	SGD/LEC	SEQ/MCQ
Reproductive System:	<ul style="list-style-type: none"> Comprehend and describe the development of kidneys, ureters, urinary bladder and urethra, and their congenital malformations. Understand and describe the development of testes, epididymis, vas deferens, seminal vesicles and prostate. Comprehend and describe development of the ovaries, uterus and vagina. Describe the development of external genital organs. Comprehend and describe congenital abnormalities of the regions. Name different brain vesicles, comprehend and describe their derivatives. Ear & Eye 	C3	SGD/LEC	SEQ/MCQ
Nervous System:	<ul style="list-style-type: none"> Understand and describe the development of spinal cord. Comprehend and describe the derivatives of neural crest. Understand and describe congenital abnormalities of the nervous system. Understand & describe the development of external, middle and internal ear. Describe congenital abnormalities of the region. Comprehend and describe the development of lacrimal apparatus, eyeball and their congenital abnormalities. 	C3	SGD/LEC	SEQ/MCQ

Domain	Level
Knowledge	C1 Knowledge C2 Comprehension C3 Application C4 Analysis C5 Synthesis C6 Evaluation
Psychomotor	P1 Observe P2 Practice P3 Adjust P4 Master P5 Develop P6 Construct
Affect	A1 Receiving A2 Responding A3 Valuing A4 Organization A5 Characterization