2nd Year MBBS
Study Guide

National University of Medical Sciences
Pakistan

CMH Lahore Medical College & Institute of Dentistry
Lahore Cantt, Pakistan

Contents

Vision:

To train undergraduate students by qualified faculty and state of the art infrastructure and technology so that students can meet the community challenges of 21st century.

Mission:

To impart core knowledge of anatomy in interesting, compact and practical way to undergraduate students by Hybrid/Spiral integrated system of teaching so that they can differentiate between normal and abnormal structure at gross, microscopic and embryological level.

Objectives:

For this we need to impart:

Knowledge of Anatomy - On principles of pedagogy

Skills:
- Dissection & Prosection
- Simulation – Models
- Cyber teaching
- Surface Anatomy
- Modern Histological techniques

Attitude:

Communication Skills
- Lecture & Presentation

Self directed learning
- CBL, Museum Atlas
- Integrated Journal
- Cyber Teaching
- E-Learning

Quest for Research
- Journal club meeting
- Library

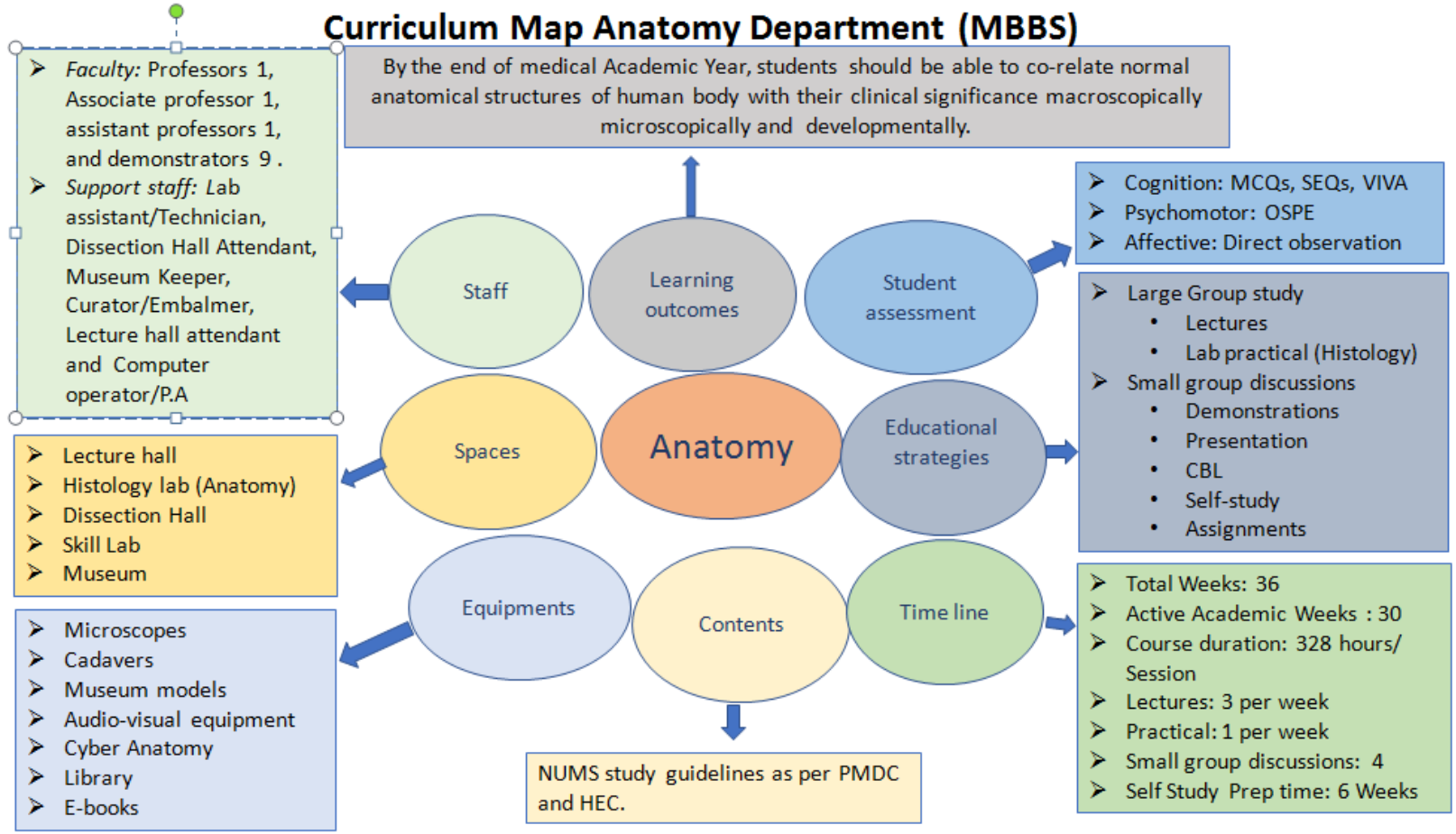
Professionalism

Empathy

Inter Personal Skills

Extra Curricular activities

Curriculum Map Anatomy Department (MBBS)



Senior Faculty

Dr. Ansa Rabia	Professor & Head of Department
Dr. Shaista Arshad	Associate Professor
Dr. Tayyaba Mahmud	Assistant Professor
Dr. Saadia Hafeez	Assistant Professor
Dr. Rabia Latif	Assistant Professor
Dr Bahadur Baloch	Assistant Professor

Demonstrators

Dr. Gull Snober
Dr. Seemi Amna Zeeshan
Dr. Rafia Hussain
Dr. Momina Qamar
Dr. Rabeea Riaz

OVERVIEW

Block with duration	Subject	Teaching & Learning	Evaluation
Block-IV (13 Weeks)	Gross Anatomy	Abdomen, Pelvis & Perineum	3 Substages *EOB - IV
	Embryology	Development of: GIT Urinary System	
	Histology	GIT Urinary System	
Block-V (09 Weeks)	Gross Anatomy	Brain & Neuro Anatomy	2 Substages *EOB - V
	Embryology	Development of: CNS Skull Genital System	
	Histology	Nervous System Special Senses Reproductive System	
Block-VI (12 weeks)	Gross Anatomy	Head & Neck	3 Substages *EOB – VI
	Embryology	Development of: Head & Neck Special Senses Integumentary System	
	Histology	Endocrine Glands Integumentary System	
*EOB – End of Block Exam			

CMH LMC & IOD – DEPARTMENT OF ANATOMY
2nd YEAR MBBS 2023 TIMETABLE

DAY	08:00 – 08:55	08:55 – 9:50	09:50 – 10:45	10:45 – 11:15	11:15 - 12:10	12:10 - 13:05	13:05-14:00	14:00 - 15:00
MONDAY	MEDICINE (CLINLEC)	PHYSIOLOGY LECTURE	BIOCHEMISTRY LECTURE	**BREAK**	**ANATOMY LECTURE**	GYNAE	TUTORIAL PHYSIOLOGY (T1,T2) BIOCHEMISTRY (T3, T4)	
TUESDAY	**ANATOMY LECTURE**	**ANATOMY (DH) SMALL GROUP DISCUSSION**			PHYSIOLOGY LECTURE	BIOCHEMISTY LECTURE	TUTORIAL PHYSIOLOGY (T1,T2) BIOCHEMISTRY (T3, T4)	
WEDNESDAY	PHYSIOLOGY LECTURE	**PRACTICAL** **C ANATOMY** B PHYSIOLOGY A BIOCHEMISTRY			BEHAVIORAL SCIENCES	BIOCHEMISTY LECTURE	ISL/PAK	**ANATOMY(DH) SMALL GROUP DISCUSSION**
THURSDAY	BIOCHEMISTRY LECTURE	**PRACTICAL** **B ANATOMY** A PHYSIOLOGY C BIOCHEMISTRY)			**ANATOMY (DH) SMALL GROUP DISCUSSION**		PHYSIOLOGY LECTURE SGD	
FRIDAY	**08:00-08:50**	**08 :50-10 :35**		**10:35-11:15**	**11:15-12:40**		**12:40 – 13:20**	**13:20 – 15:00**
	ANATOMY LECTURE	**PRACTICAL** **A ANATOMY** C PHYSIOLOGY B BIOCHEMISTRY)		**SURGERY (CLIN LEC)**	**ANATOMY (DH) SMALL GROUP DISCUSSION**		**JUMAH BREAK**	**DIRECTED SELF LEARNING BEH SC**

INTRODUCTION

a. Preamble

Integration has been accepted as an important educational strategy in medical education. The recently revised standards by the Pakistan Medical and Dental Council (PM&DC) encourages integration of major subjects both horizontally and longitudinally. This curriculum meets thestandards of Pakistan Medical and Dental Council, and our students, on completion of program, will develop required competencies as defined worldwide in a graduate doctor.

MBBS Years I & II will deal with the normal structure, function and biochemical aspects of human body which is delivered in an integrated manner in clinical context. Early clinical exposure will be ensured by interspersed sessions throughout the curriculum, wherein the students will learn via discussing real life scenarios which they will encounter in clinical settings. This curriculum also aims to improve different skills of future doctors including communication, leadership, management and research skills, and inculcate ethical values and professionalism.

This curriculum has been developed by the faculty of basic and clinical sciences from constituent/affiliated colleges in collaboration with NUMS Academic Directorate.

b. Curriculum perspective

NUMS curriculum is evolved taking into consideration Constructivist, Cognitivist, behaviorist with some element of Constructivist approach. It allows students to construct their own knowledge based on what they already know and to use that knowledge in purposeful activities requiring decision making, problem solving and judgments.

c. Level of integration: The `complementary' approach which is both subject-based and integrated teaching will be used. The integrated sessions will represent a major feature of thecurriculum.

d. Competencies The focus of this curriculum is on the roles of a general physician as identified in the CanMEDS. These are Medical Expert, Manager, Communicator, Health Advocate, Collaborator, Professional and Scholar. Competencies focused in year I and II are: -

1) Medical Knowledge
2) Problem solving
3) Procedural skills
4) Communication skills
5) Empathy
6) Professionalism
7) Leadership and Management skills
8) Research skills

e. Outcomes

By the end of second year, students should be able to:

1) Correlate the developmental and anatomical knowledge of GIT & metabolism, renal,neurosciences, Genetics, Craniocervical, Special senses, Endocrinal & Reproductive systems to their physiological, and biochemical basis.
2) Integrate the fundamental concepts of social and behavioural sciences with knowledge ofother medical subjects
3) Apply the principles of research for writing research proposal
4) Analyze multiple perspectives of Pakistan studies

f. Academic Calendar Year II

g. Proposed Contact Hours Distribution Year-II

SUBJECTS	SECOND YEAR
Anatomy • Embryology • Histology Gross Anatomy	**250**
Physiology	**225**
Biochemistry	**125**
Research Methodology & Evidence based Medicine	**20**
Medicine & Allied	**30**
Surgery & Allied	**30**
Pakistan Studies	**15**
Behavioral Science	**75**
Self-Directed Learning	**100**
Co-curricular activities	**40**
TOTAL HOURS	**910**

h. Educational strategies

1) Lectures
2) Small group discussion
3) Lab practical
4) Skill lab
5) Problem based learning/ Case based learning
6) Tutorials

i. Resources. To be filled in by the institute

1) Faculty
2) Facilities
3) Administration for Course
4) Administrative structure
5) Communication with students

j. Internal Assessment

Students will be assessed at the end of each block. The weighting of internal assessment is 20% in 2nd professional MBBS Examination. There will be three end of blocks and one pre -annualexamination. The scores of tests of each end block assessment and pre-annual examination will be used for calculation of the internal assessment.

k. Annual Professional Examination.

The University will take the first professional Examination as per PM&DC guidelines at the end of the academic year. Annual Theory & Practical Examination will be of 200 marks for Anatomy, Physiology, Biochemistry and 50 marks theory paper each of Islamiyat and Pakistan Studies. The passing score is 50% in theory and practical separately.

l. Evaluation of the Course. To be filled in by the institute

a. The major goals of the evaluation are to monitor quality of and improve curriculum
b. Student portfolio shall be maintained in the departments in which students will give their feedback either by name or anonymously. Feedback may be taken at the end of module, online and informal student feedback during the running module
c. Faculty suggestions if any, for improvement of training may be incorporated in the next session.

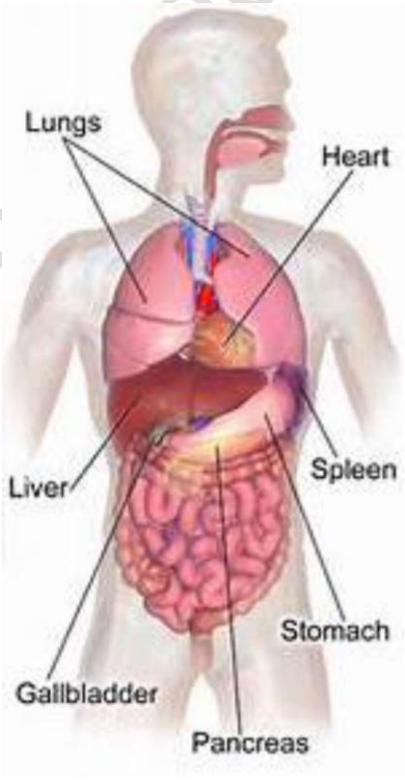
m. Implementation of curriculum

1) The university will give details of all content including learning outcomes, assessment blueprints, and table of specifications, distribution of which across the whole years and rotations is upon the discretion of the medical college/institute
2) Early clinical exposure may be achieved by allocating hours to skill labs, Medicine & Surgery ward visits in each module or patient may be brought before the students as per the decision of institute.

BLOCK-IV
(13 Weeks)
5+7 weeks

Consist of following 02 Modules:

- **Gastrointestinal system**
- **Genitourinary system**



1. **Introduction:**

   This block comprises of following modules:

   a. Gastrointestinal system **(4 weeks)**
   b. Renal **(6 weeks)**
   c. Carbohydrates metabolism **(throughout the Module)**

2. **Duration**:

   Total duration of the block is 12 weeks. 10 weeks are for teaching and learning and 2 weeksare for end block assessment

   a. <u>Gastrointestinal system (4 weeks)</u>

   This module focuses on histo-morphological and embryological structure and physiological and biochemical function of gastrointestinal system along with basic understanding of structure of abdomen and role of ATP in health and disease. Learning process involves delivering the content with clinical relevance. At the very outset medical student should understand the importance of gastrointestinal system in the fields of Medicine. The research methodology, Behavioral Sciences & Professionalism will be taught as a part of the longitudinal theme.

   Learning Outcomes

   At the end of this module, student will be able to:

   - Correlate the gross anatomical, developmental & light microscopic features of gastrointestinal system with their physiological functions and biochemical basis
   - Apply the knowledge of gross anatomy of abdomen to understand relevant
   - clinicalscenarios
   - Relate the role of ATP and energy metabolism for understanding the
   - diseaseprocess
   - Relate their relevant knowledge of this module in subsequent years of clinical
   - trainingand practice
   - Relate the development, macro and microscopic features, physiological and biochemical aspects of digestive tract & its associated glands with their specified clinical presentations

   b. <u>Renal (6 weeks)</u>

   This module includes basic understanding of structure of pelvis and perineum along with histo-morphological, embryological structure and function of KUB. Learning process involvesdelivering the content with clinical relevance. At the very outset medical student should understand the importance of KUB in the fields of Medicine. The research methodology, Behavioral Sciences & Professionalism will be taught as a part of the longitudinal theme.

   Learning Outcomes

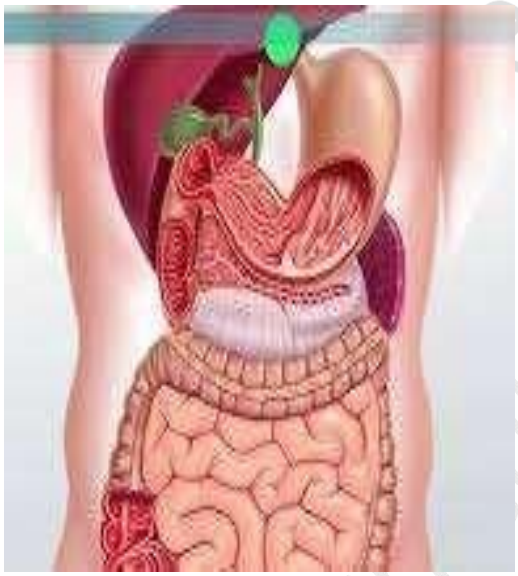
   At the end of this module, student will be able to:

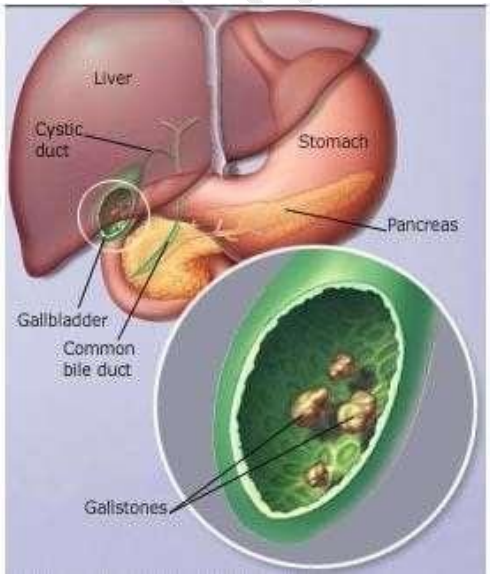
   - Recognize the normal histomorphological features of KUB and apply this knowledge inidentifying common relevant histopathological in future.
   - Appraise the normal development of KUB and evaluate the embryological basis of common congenital anomalies related with development of this system.
   - Appraise the topographic anatomy of pelvis & perineum to deal with common clinical problems related with them.
   - Correlate the gross anatomical, developmental & light microscopic features of KUB with their physiological functions and biochemical basis

- Relate their relevant knowledge of this module in subsequent years of clinical training andpractice
- Relate the development, macro and microscopic features, physiological and biochemicalaspects of renal system with its specified clinical presentations

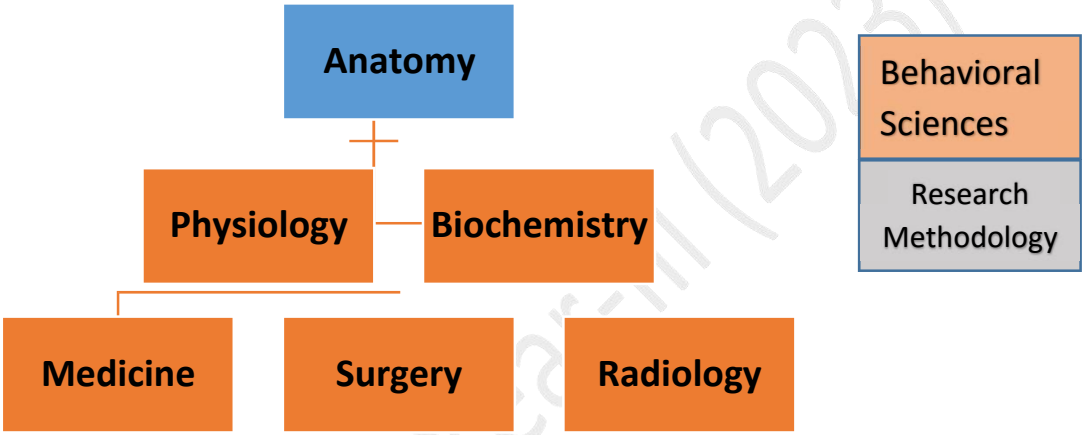
c. **<u>Carbohydrates Metabolism</u> (Throughout the block).** Carbohydrates chemistry and metabolism is very important for understanding different metabolic disorders so this topic will be taught longitudinally throughout the module wherever required. At the end of thismodule, student will be able to apply the biochemical knowledge of carbohydrates for understanding their related disorders

MBBS YEAR II
BLOCK IV
MODULE VIII
Digestive system and Metabolism - I
Duration : 05 weeks





Integration of Disciplines in this Module



MODULE PLANNING COMMITTEE

Module Coordinator	**Dr. Saadia Hafeez Qureshi**
Members	**Dr. Rafia Hussain** **Dr. Momina Qamar** **Dr. Rabeea Riaz**

Preamble

This module focuses on histo-morphological and embryological structure as well as physiological and biochemical functioning of digestive system. It also emphases on the carbohydrates' chemistry, metabolism, nutrition and role of vitamins in different metabolic disorders. It allows students to appraiseintegration and regulation of metabolic pathways in different tissues.

Learning process involves delivering the content with clinical relevance. At the very outset medical student should understand the importance of gastrointestinal system in the fields of Medicine. The Pakistan Studies, Research methodology and Behavioral Sciences will be taught as a part of the longitudinal theme.

Outcomes. By the end of this module, student should be able to:

1. Relate the gross anatomical, developmental & light microscopic features of GIT and Hepatobiliarysystem with their physiological functions and biochemical basis
2. Appraise the importance of carbohydrates' chemistry, metabolism, nutrition and vitamins indifferent metabolic disorders
3. Apply their relevant knowledge of this module in subsequent years of clinical training and practice

ANATOMY				
Topic / Theme	**Learning outcomes**	**Learning Objectives/Contents**	**Instructional Strategies**	**Assessment tool**
	By the end of this block, students should be able to:			
SPECIAL HISTOLOGY				
Introduction toGIT histology	Relate the normal microscopic structure of tubular digestive tract and associated glands with their functions and commonclinical disorders.	**Knowledge** • Describe the general structuralplan of alimentary canal	LGIS	MCQ SEQ SAQ
Histology of esophagus		**Knowledge** • Describe the histomorphologicalfeatures of esophagus • Differentiate between 3 parts ofesophagus microscopically	LGIS	MCQ SEQ SAQ Viva Voce
		Skill • Identify a slide of esophagusunder a microscope • Illustrate its section on thejournal • List two points of identification	Lab	OSP E SAQ Viva Voce
Histology ofStomach		**Knowledge** • Differentiate between a gastricgland and pit • Enumerate cells forminggastric glands • Describe the structure and function of cells forming gastricglands • Compare the histological structure of cardia, fundus andpylorus of stomach • Correlate a case of gastritis withpernicious anemia on basis of histology	LGIS	MCQ SEQ SAQ Viva Voce

		Skill • Identify slides of different regions of stomach under lightmicroscope • Illustrate its section (fundus andpylorus) on the journal • List two points of identification	Lab	OSP E SAQ Viva Voce
Histology of smallintestine		**Knowledge** • Describe the mucosal modifications of small intestinefor carrying out its functions effectively (adaptive measures) • Describe the light microscopic structure of duodenum, jejunumand ileum • Tabulate the histological differences between duodenum,jejunum and ileum	LGIS	MCQ SEQ SAQ Viva Voce
		Skill • Identify the slides of duodenum,jejunum and ileum under microscope. • List two points of identificationof each. • Illustrate the microscopic structure of these structures inthe journal	Lab	OSP E SAQ Viva Voce
Histology of largeintestine		**Knowledge** • Describe the histological structure of large intestine • Justify the increase in number ofgoblet cells in comparison with the decrease in the absorptive cells down the tract	LGIS	MCQ SEQ SAQ Viva Voce
		Skill • Identify the slides of appendix,and colon under microscope • List two points of identificationof each • Illustrate the microscopic sections of colon and appendixin the journal	Lab	OSP E SAQ Viva Voce

Histology ofliver & gall bladder		**Knowledge** • Describe the histological structure of liver & gall bladder • Correlate the common clinicalconditions of liver and gall bladder with their normal histological features	LGIS	MCQ SEQ SAQ Viva Voce
		Skill • Identify the slides of liver and gall bladder under microscope • List two points of identificationof each • Illustrate the microscopicstructure of liver and gallbladder in journal.	Lab	OSP E SAQ Viva Voce
Histology of Pancreas		**Knowledge** • Describe the light microscopicstructure of of pancreas	LGIS	MCQ SEQ SAQ Viva Voce
		Skill • Identify the section of pancreas on given slide under microscope • List two points of identification. • Illustrate the histological structure of pancreas in journal	Lab	OSP E SAQ Viva Voce
SPECIAL EMBRYOLOGY				

Developmentof foregut	Relate the developmental eventsof Gastrointestinal system and associatedglands with embryological basis ofrelevant congenital anomalies	**<u>Knowledge</u>** • List derivatives of foregut • Describe the development ofesophagus • Explain the embryological basisof the trachea-esophageal fistula, esophageal atresia and hiatal hernia • Describe the development of stomach with special reference to its rotations and relocation ofboth vagi • Enlist derivatives of ventral anddorsal mesentery of foregut • Explain the formation of lesser sac	LGIS	MCQ SEQ SAQ Viva Voce

		• Explain the embryological basisof pyloric stenosis • Describe the development ofduodenum • Describe the development ofliver, biliary apparatus and spleen • Explain the embryological basis of accessory hepatic ducts, duplication of gall bladder, extraand intra hepatic • Explain the development ofpancreas • Explain the embryological basis of Annular pancreas and accessory pancreatic tissue.		
Developme ntof midgut		**<u>Knowledge</u>** • List derivatives of mid gut • Describe physiological herniation with emphasis uponrationale behind its occurrenceand reduction • Correlate the rotation of midgutloop with definitive positioning of mid gut derivatives in abdomen • Correlate development of midgut with abnormalities of mesenteries, vitelline duct abnormalities, gut rotation defects, gut atresia & stenosis • Differentiate between omphalocele, umbilical hernia and gastroschisis on the basis of embryology	LGIS	MCQ SEQ SAQ Viva Voce
Developme ntof hindgut		**<u>Knowledge</u>** • List derivatives of hindgut • Describe the partitioning of cloaca and its consequences • Describe the development of derivatives of anorectal canal		MCQ SEQ SAQ Viva Voce

Development of digestive system	Correlate the knowledge of	**Skill**	SGD	OSPE Viva Voce

	development of digestive tract with three-dimensional spatial arrangementof developing structures with help of models.	• Identify parts of developingdigestive system on given models and diagrams		
GROSS ANATOMY				

Anterior abdominalwall	• Correlate the topographic anatomy of Abdomen, Pelvis &Perineum with their functions andbiochemical features and applythis knowledge for analyzing relevant clinical scenarios • Apply the knowledge and skillgained through dissection of cadavers & study ofmodels and prosected specimens of abdomen, pelvis and perineum to learn the related basic surgical procedures, in subsequent years of training and practice • Outline the abdominal Viscera & main vessels on the surface of givensubject by applyingthe gross anatomical	**<u>Knowledge</u>** • Identify nine regions of abdominal cavity to locate thetopographic arrangement of underlying abdominal organ. • Explain the clinical importanceof membranous layer of superficial fascia with anatomical reasoning. • Describe the attachments, &nerve supply and actions of muscles of anterolateral abdominal wall. • Describe the formation of rectussheath at different levels of abdomen and enlist its contents. • Describe the blood supply,nerve supply & lymphatic drainage • of anterolateral abdominal wall • Describe various types ofabdominal hernias	SGD	MCQ SEQ SAQ OSPE Viva Voce

	knowledge for evaluating the relevant clinical presentations • Comprehend the normal radiographic appearance of softand bony tissues of abdomen & pelvis			
Inguin alCanal		**<u>Knowledge</u>** • Describe the extent and enlist the structures forming various walls of inguinal canal • Analyze the functions & mechanics of inguinal canal • List the structures passing through the inguinal canal inmales and females • Differentiate between direct &indirect inguinal hernia with regards to their relation with age, predisposing factor, frequency, coverings on exit from abdominal cavity, course,& exit from anterior abdominalwall • Describe extent, coverings & contents of spermatic cord	SGD	MCQ SEQ SAQ OSPE Viva Voce

External Male genitalia		**<u>Knowledge</u>** • Explain the significance ofpampiniform plexus • Describe the blood supply,lymphatic drainage and innervation of testis. • Trace the route for the involvement of different group of lymph nodes in the carcinomaof testis and scrotum • Define hydrocele, hematocele &varicocele • Justify the more common occurrence of varicocele on left	SGD	MCQ SEQ SAQ OSPE Viva Voce

		side of body with anatomicalreasoning		
Peritoneum		**<u>Knowledge</u>** • Describe Peritoneum and itsmodifications • Enumerate intraperitoneal, extrapertinoeal, & secondarilyretropertoneal organs. • Define following with one example each: Mesentry, Omentum, Ligaments, Folds,Recesses, Pouches, Gutters • Demonstrate the vertical andhorizontal disposition of peritoneum on the model of abdomen and pelvis. • Demonstrate the attachment ofgreater & lesser omentum in the given model. • Demonstrate the differences in arrangement of peritoneum in males and females in the given model of pelvis • Explain peritoneal infection, adhesions & anatomical basis ofspread of pathological fluid in various peritoneal compartments along with their surgical approach • Describe the basis of peritoneal pain with reference to its parietal and visceral layers	SGD	MCQ SEQ SAQ OSP E Viva Voce
Abdominal esophagus		**<u>Knowledge</u>** • Describe abdominal esophagusregarding its relations, blood supply, nerve supply and lymphatic drainage • Describe the anatomical basis of bleeding esophageal varices	SGD	MCQ SEQ SAQ OSPE Viva Voce

Stomach		**<u>Knowledge</u>** • Demonstrate the position & gross features of stomach on	SGD	MCQ SEQ SAQ OSPE Viva Voce

		the given model and identifythe omenta attached • Describe the blood supply, nerve supply and lymphaticdrainage of stomach • Enumerate the structures lyingin stomach bed • Explain gastric and peptic ulcerswith reference to their commonlocations and blood vessels endangered as a consequence of perforation		
Small Intestine		**<u>Knowledge</u>** • Describe the gross features relations, blood supply nerve supply and lymphatic drainageof various parts of small intestine • Differentiate between gross features of jejunum and ileumin tabulated form • Explain the common sites andthe effects of perforation of ulcers affecting different partsof duodenum applying your knowledge of gross anatomy	SGD	MCQ SEQ SAQ OSPE Viva Voce
Large intestine		**<u>Knowledge</u>** • Differentiate between small and large intestine on grossinspection • Explain the topographic Anatomy of large intestine withthe help of a model • Explain the clinical importanceof variable positions of appendix with anatomical reasoning. • Analyze the clinical presentation of a scenario ofappendicitis applying your knowledge of gross anatomy	SGD	MCQ SEQ SAQ OSPE Viva Voce

		• Define diverticulosis, volvulus, intussusception, cecostomy, &colostomy		
Blood supply ofintestinal tract		**<u>Knowledge</u>** • Describe coeliac trunk with reference to its origin, branchesand distribution • Describe superior mesentericartery with reference to its origin, branches and distribution • Describe inferior mesentericartery with reference to its origin, branches and distribution • Correlate the clinical problemsoccurring due to occlusion of GIT blood vessels with anatomical basis	SGD	MCQ SEQ SAQOSPE Viva Voce
Hepatic portal system		• Describe the formation, relations, significance & tributaries of portal vein. • Describe the sites of porto-systemic shunts mentioning thenames of veins involved. • Explain the role of porto-systemic anastomosis in portalhypertension	SGD	MCQ SEQ SAQ OSP E Viva Voce
Liver		**<u>Knowledge</u>** • Describe the position, lobes,size, shape, coverings and ligaments of liver. • Describe the dual • blood supply lymph drainageand nerve supply of liver • Correlate the concept of hepatic lobectomies and segmentectomy with • anatomical reasons • Identify the preferred site for liver biopsy and justify	SGD	MCQ SEQ SAQ OSPE Viva Voce

		this preference with anatomicalreasoning		

Hepatic biliary apparatus		**Knowledge** • Enumerate the components ofIntra & Extra Hepatic Biliary Systems • Describe the gross features, relations and blood supply ofgall bladder • Describe the formation, courseand termination of common bile duct • Correlate the clinical presentation of gall stones andcholecystitis with anatomical knowledge	SGD	MCQ SEQ SAQ OSPE Viva Voce
Pancreas		**Knowledge** • Describe the location, parts relations and ducts of pancreas • Describe the blood supply,nerve supply, lymphatic drainage of pancreas. • Correlate the clinical scenario ofobstructive jaundice with pancreatitis, obstruction of hepatopancreatic ampulla, cancer of head of pancreas & bile duct. • Justify the referred • pain of acute pancreatitis withanatomical reasoning	SGD	MCQ SEQ SAQ OSPE Viva Voce
Spleen		**Knowledge** • Describe location, relations, blood supply, nerve supply &lymphatic drainage of spleen, • Justify the direction of splenomegaly with anatomicalknowledge of its ligaments • Justify the possibility of splenic rupture in case of fracture oflower left ribs	SGD	MCQ SEQ SAQ OSPE Viva Voce

Skills		• Identify the various organs, impressions, ligaments, nerves,muscles, blood vessels related to digestive system on given models and specimens.	SGD	OSPE Viva
Surface Anatomy		• Mark transpyloric, intercristal,subcostal and midclavicular planes on the abdomen of subject/model for delineationof abdominal regions • Mark the following on thesurface of given subject: o Stomach o Liver o Pancreas o Duodenum o Spleen o Large intestine o McBurney's point	SGD	Viva Voce

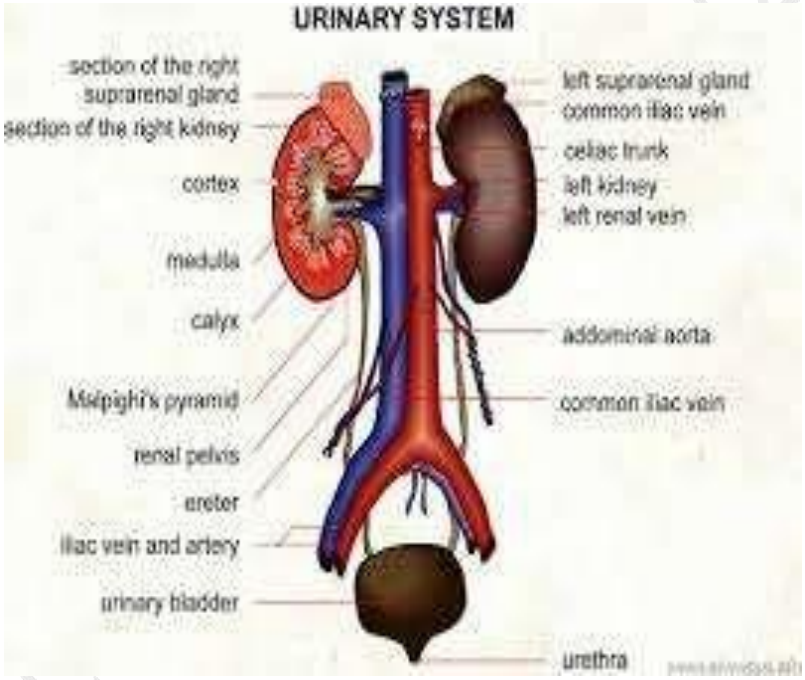
LIST OF PRACTICALS:

S.No.	Practicals
Identify and illustrate the microscopic structure of following:	
1	Esophagus and Stomach
2	Cardiac end of stomach
3	Small Intestine
4	Colon and Appendix
5	Liver
6	Gall bladder and Pancreas
7	Anal canal

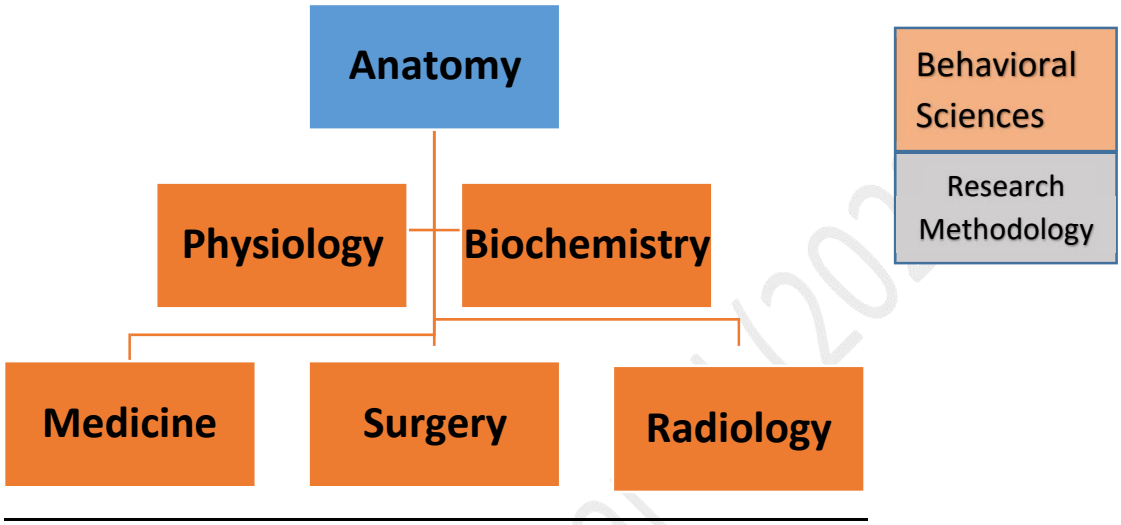
LEARNING RESOURCES:

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 (5thRevised 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).

MBBS YEAR II
BLOCK IV
MODULE IX
Genitourinary System Module
Duration: 07 weeks



Integration of Disciplines in this Module



MODULE PLANNING COMMITTEE

Module Director	**Dr. Saadia Hafeez Qureshi**
Members	**Dr. Rafia Hussain** **Dr. Momina Qamar** **Dr. Rabeea Riaz**

Preamble

This module includes basic understanding of histo-morphological embryological and physiological basis of genitourinary system Learning process involves delivering the content with clinical relevance. Learning process involves delivering the content with clinical relevance. At the very outset medical student should understand the importance of genitourinary system in the fields of Medicine. The research methodology and Behavioral Sciences will be taught as a part of the longitudinal theme.

Learning Outcome:

By the end of this module, student should be able to correlate the physiological and biochemical concepts related to genitourinary system with their anatomical knowledge and apply their relevant knowledge of this module in subsequent years of clinical training and practice

ANATOMY				
Title/Theme	**Learning outcomes**	**Learning Objectives/Contents**	**MIT**	**Assessment tool**
	By the end of this block, students should be able to:			
SPECIAL HISTOLOGY				
Histology of Kidney	• Correlate the normalmicroscopic structure of urinary systems with its functions and apply this knowledge in understanding their altered structure in subsequent years of training and practice • Examine the slides ofurinary system under light microscope at different magnifications and recognize their points of identification. • Relate the histomorphological features of reproductive systemwith their functions • Identify the histomorphological features of reproductive systemunder light	**<u>Knowledge</u>** • List parts of a uriniferous tubuleand glomerulus • Locate the different parts of uriniferous tubule in cortex and medulla of kidney topographically • Describe the light microscopic structure of different parts of uriniferous tubule with specialreference to epithelium • List the components formingfiltration membrane and juxtaglomerular apparatus • Differentiate between crosssection of PCT and DCT	LGIS	MCQ SEQ SAQ Viva Voce
		<u>Skill</u> • Identify the histological featuresof kidney on a slide under microscope • Write two points of identification • Draw a labeled diagram ofidentified tissue in journal	Lab	OSP E SAQ Viva Voce
Histology of ureter and urinary bladder		**<u>Knowledge</u>** • Describe the light microscopic structure of ureter (upper and lower parts) and urinary bladder	LGIS	MCQ SEQ SAQ Viva Voce

	microscope by focusing the slides atdifferent magnifications	**Skill** • Identify the histological featuresof Ureter & Urinary bladder under microscope • Write two points of identification • Draw a labeled diagram of identified tissue on histologynotebook	Lab	OSP E SAQ Viva Voce

Histology of male reproductive system		**<u>Knowledge</u>** • Describe the histological features of testes and correlate the blood-testes barrier with its functions. • Explain the light microscopic features of male genital ducts. • Explain the light microscopic features of accessory glands ofthe male reproductive system • Apply the knowledge of histologyto explain the clinical scenarios ofImmotile cilia syndrome, benign prostatic hypertrophy and carcinoma of prostate	LGIS	MCQ SEQ SAQ Viva Voce
		<u>Skill</u> • Identify, differentiate and illustrate the light microscopicstructure of o Testis o Epididymis o Vas deferens o Seminal vesicle o Prostate	Lab	OSP E SAQ Viva Voce
Histology of female reproducti vesystem		**<u>Knowledge</u>** • Describe the light microscopicfeatures of following female reproductive organs o Ovaries o Fallopian tubes o Uterus o Cervix o Vagina o Mammary gland	LGIS	MCQ SEQ SAQ Viva Voce

		Skill • Identify, differentiate and illustratefollowing components of female reproductive system. o Ovaries o Fallopian tubes o Uterus o Cervix o Vagina	Lab	OSP E SAQ Viva Voce

		o Mammary gland		
SPECIAL EMBRYOLOGY				
Development of urinary system	• Correlate the developmental process of urinary system with embryological basis of relevant congenital anomalies • Compare the developmental events of male and female reproductive system and interpretthe embryological basis of relevant congenital anomalies	• List the sources of urinarysystem • Interpret the following stages ofdevelopment of kidneys briefly a. Pronephros b. Mesonephros c. Metanephros • Describe the development of definitive kidney with referenceto the sources of different partsof uriniferous tubule, rotation and ascent of kidneys • Correlate following congenitalanomalies with normal development a. Wilm's tumour b. Horseshoe kidney c. Pelvic kidney d. Poly cystic kidneys e. Ectopic/accessory kidney f. Malrotated kidney g. Agenesis of kidney • Enumerate different parts and derivatives of urogenital sinus • Enlist the sources of ureter, urinary bladder and urethra • Describe the development of urinary bladder • Explain the anatomical relationship of ductus deferens with ureter with embryological reasoning • Correlate various urachal anomalies, exstrophy of bladder and exstrophy of cloaca with normal development	LGIS	MCQ SEQ SAQ Viva Voce
Development of reproductive system		• Explain the indifferent stage ofgonad development. • Explain the developmentand	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		descent of testis.		

		• Describe the embryologicalbasis of cryptorchidism • Explain the developmentof ovaries • Describe the indifferentstage of genital ducts • Enumerate the derivatives ofmesonephric duct, paramesonephric duct and urogenital sinus in males andfemales. • Explain the development of genital ducts in the male andfemale. • Apply the knowledge of embryology to explain thefollowing congenital anomalies: ➢ Uterus didelphys ➢ Uterus arcuatus ➢ Uterus bicornis ➢ Vaginal atresia • Describe the indifferent stage of external genitalia. • Explain the development of external genitalia in the maleand female. • List common anomalies of themale genitalia. • Describe the embryological basisof hypospadias and epispadias. • Apply the knowledge of embryology to explain the basisand clinical presentation of following disorders of sexual development: ➢ Ambiguous genitalia ➢ Hermaphrodites ➢ Congenital adrenal hyperplasia ➢ Gonadal dysgenesis		

Skills	Correlate the knowledgeof development of genitourinary system with three-dimensional spatial arrangement of developing structures	**Skill** Identify parts of developing genitourinary system on givenmodels and diagrams showingdifferent developmental phenomena	SGD	OSPE Viva Voce
GROSS ANATOMY				
Kidney and supraren alglands	Correlate the topographicanatomy of posterior abdominal wall, urinary system, reproductive system, pelvis and perineum with presentation of relevant clinical scenarios	• Describe the gross features ofkidney, relations, and its coverings • Draw and label the relations of anterior and posterior surfacesof both kidneys • Identify the impressions ofsurrounding structures on both kidneys in the given model. • Describe the blood supply, nerve supply, & lymphatic drainage of kidney • Describe the possible routes ofspread of perinephric abscess • Explain the anatomical basis oftypical renal colic • Describe location, gross features, relations, bloodsupply, nerve supply, & lymphatic drainage of suprarenal glands • Explain surgical significance ofrenal fascia and separate compartment for suprarenal gland	SGD	MCQ SEQ SAQ OSPE Viva Voce
Ureter		• Describe the gross features, relations, & course of both ureters on the model / specimen while emphasizingupon its constrictions. • Describe the blood and nervesupply of ureter. • Explain the anatomical basis of	SGD	MCQ SEQ SAQ OSPE Viva Voce

		ureteric stone impaction.		

		• Justify referred pain of uretericcolic with anatomical reasoning.		
Lumbar vertebral column and nerves of posterior abdominal wall		• Describe the fascia of posterior abdominal wall • Distinguish lumbar vertebraefrom cervical & thoracic vertebrae • Describe anatomical features ofa typical lumbar vertebra	SGD	MCQ SEQ SAQ OSPE Viva Voce
Muscles of posterior abdomin alwall		• Explain the origin, insertion, nerve supply and actions of muscles of posterior abdominalwall • Describe the fascial lining of theabdominal walls • Analyze the anatomical basis of a case of psoas abscess and itsspread	SGD	MCQ SEQ SAQ OSPE Viva Voce
Major vessels ofposterior abdominal wall		• Describe the extent, relations,and branches of abdominal aorta along with their distribution. • Describe the obliteration ofabdominal aorta & iliac arteries. • Explain formation, & tributaries of inferior venacava • Identify the abdominal relations of inferior vena cava in the givenmodel. • Explain the collateral routes forabdominopelvic venous blood & compression of inferior venacava. • Define aortic aneurysm. Identify the common site ofabdominal aortic aneurysm	SGD	MCQ SEQ SAQ OSPE Viva Voce

Lymphatic drainage of abdomen		• Name the groups of lymph nodesdraining the abdomen. • Describe the terminal group of lymph nodes around abdominalaorta	SGD	MCQ SEQ SAQ OSPE Viva Voce

		• Describe the lymphatic trunks, cisterna chili & commencement ofthe thoracic duct. • Differentiate between the location and area of drainage of pre and para-aortic lymph nodes • Explain the continuity of abdominal lymphatic system withother regions with reference to spread of malignancy and infection of various abdominal organs		
Pelvic walls		• Describe the boundaries of true and false pelvis. • Explain the bony landmarks & sites of muscular attachments on sacrum • List the anatomical landmarks measured while performing internal pelvimetry • Justify occurrence of low back pain in sacroiliac joint disease • Describe the type, articulations, ligaments & movements of joints of pelvis. • List the structures commonly injured in a patient of pelvic fracture. • Enumerate the structures formingpelvic diaphragm. • Describe the origin, insertion, nerve supply & actions of musclesof pelvic walls & floor • Explain the functional significance of pelvic floor in females • Analyze the clinical presentation of a case of injury to pelvic floor with anatomical reasoning	SGD	MCQ SEQ SAQ OSPE Viva Voce
Pelvic organs		• Describe relation, blood supply, lymphatic drainage and nerve supply of sigmoid colon • Describe the relations, peritoneal	SGD	MCQSEQ SAQ OSPE Viva Voce

		reflections, curvatures, blood		

		supply, lymphatic drainage & nerve supply of rectum • List the structures palpated in males and females while performing rectal examination • Describe the gross features, peritoneal covering, blood supply nerve supply and lymphatic drainage of urinary bladder • Identify the anatomical routes of possible spread of bladder cancer • Differentiate between the relations of urinary bladder in models of both genders. • Enumerate the structures visualized during cystoscopy • Identify the site commonly selected for suprapubic aspirationof urine • Define vasectomy and its clinical importance • Explain the Anatomy of prostate with reference to its surfaces, lobes, relations, blood supply, nerve supply and lymphatic drainage of prostate • Identify the parts of prostate most likely to be involved in benign andmalignant growths of prostate • Justify the metastasis of carcinoma of prostate to vertebralcolumn & cranial cavity on basis ofvenous drainage • Describe the blood supply, nerve supply, lymphatic drainage of ovaries and fallopian tubes • Correlate the anatomy of female genital tract with hysterosalpingography, ligation of uterine tubes, ectopic tubal pregnancy		

		• Describe the parts, ligaments, relations and support of uterus		

		• Describe blood supply, nerve supply, & lymphatic drainage of uterus • Comprehend a case of uterine prolapse on the basis • of gross anatomy of uterus and itssupports • Define hysterectomy and explain the precautionary measures to be taken necessarily during this procedure • Identify the anatomical routes for spread of malignancies of uterus, cervix and ovary • Illustrate sacral plexus showing itsbranches • List the branches of internal iliac artery • Enumerate different groups of lymph nodes of pelvis. • Explain the role of lymphatics and lymph nodes in spread of malignancies of pelvis		
Perineum		• Define perineum. Identify its borders, relations & divisions • Explain the boundaries of superficial and deep perineal pouches and enumerate their contents in both genders • Illustrate the cutaneous nerves ofthe perineum. • Define perineal body. List structures attached with it. Justifyits clinical importance • Describe the relations, internal features, blood supply, lymphatic drainage, & innervation of anal canal • Differentiate between clinical presentation of internal and external hemorrhoids on anatomical basis	SGD	MCQ SEQ SAQ OSPE Viva Voce

		• Elucidate perianal hematoma, fissure, abscess and fistulas of anal canal with anatomical basis of their occurrence and presentation • Justify the anatomical reasoning of anorectal incontinence • Describe the boundaries, contents & recesses of ischiorectal fossa • Justify the possible routes of spread of ischiorectal abscess withanatomical reasoning • Explain area of anesthesia, indications, & list steps of • pudendal nerve block • Describe the gross features of vagina including relations, blood supply, nerve supply & supports • Apply the anatomical knowledge in analyzing a case of vaginal prolapse (cystocele and rectocele,and vaginal fistula • Define culdocentecis and describe its diagnostic and therapeutic importance • Explain gross features of all parts of male & female urethra, its arterial supply, venous drainage &nerve supply • Apply anatomical reasoning in justifying the route of extravasation of urine in case of injury to different parts of male urethra • List the anatomical structures encountered while performing urethral catheterization • List parts of external genitalia and describe their blood and nerve supply • Provide the anatomical basis of presentation of Bartholin cyst		

Application of knowledge on models/specimen		**Skills** • Identify the various organs, impressions, ligaments, nerves, muscles, blood vessels related to renal system, pelvis and perineum on given models and specimens. • Differentiate b/w anatomical features of male & female pelvis inthe given model • Demonstrate the orientation of pelvic girdle. • Demonstrate the features of bonypelvis in the given model • Demonstrate boundaries of pelvic inlet and pelvic outlet	SGD	OSPE Viva
Surface Anatomy		**Skill** • Mark the following on the surfaceof given subject: • Kidneys • Suprarenal glands • Ureter • Abdominal aorta • Inferior vena cava	SGD	Viva Voce

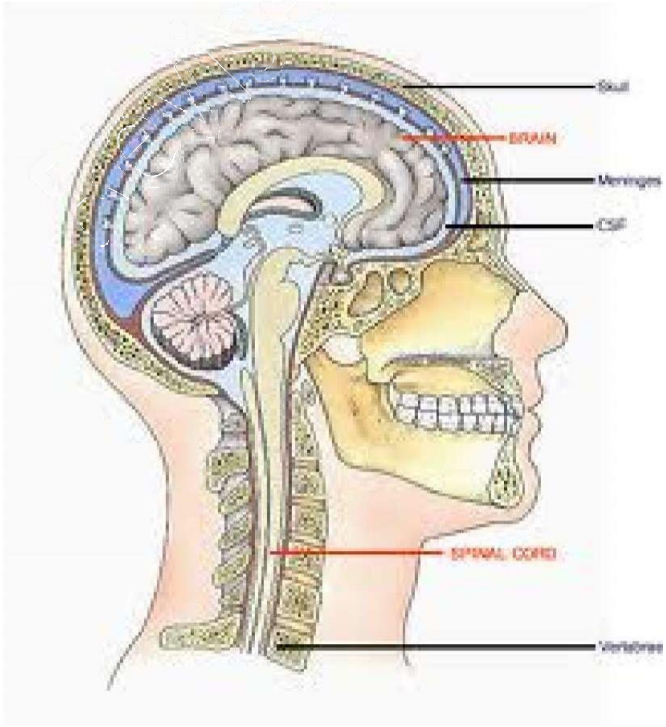
Practicals	
Identify and illustrate the microscopic structure of following:	
1	Kidney
2	Ureter & urinary bladder
3	Testis & Epididymis
4	Ductus deferens & Prostate
5	Ovary & Fallopian tube
6	Uterus ,and Vagina
7	Mammary gland

LEARNING RESOURCES:

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).

BLOCK-V

- **Neuroscience**
- Brain & Spinal Cord
- Molecular Medicine & Genetics



MBBS YEAR II
BLOCK V
MODULE X
Genetics & Neuroscience I
Duration: 09+01=10 weeks

1. Introduction:

This block comprises of following modules:

a. Neuroscience/ Brain & Spinal Cord/ Molecular Medicine & Genetics

2. Duration:

Total duration of the block is 10 weeks. 8 weeks are for teaching and learning and 2 weeks are for end block assessment

3. Preamble

This module provides an insight to histo-morphological and embryological structure and function of Central Nervous system. It also focuses on biochemical basis of nucleotide, molecular medicine and Genetics, Xenobiotics, cancer & aging and antioxidants & free radicals. Learning process involves delivering the content with clinical relevance. This module allows medical student to understand the importance of Central Nervous System in the fields of Medicine.

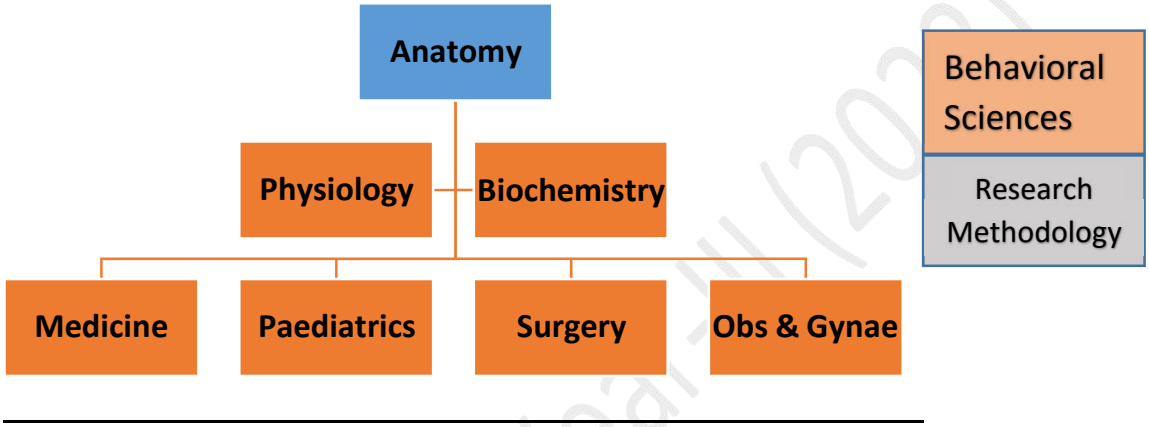
The Research Methodology, Behavioral Sciences & Professionalism will be taught as a part of the longitudinal theme.

Learning Outcomes

At the end of this module, student will be able to:

- Correlate the gross anatomical, developmental & light microscopic features of Nervous System with their functions to apply this knowledge in relevant clinical scenarios encountered in subsequent years of training and practice.
- Correlate the developmental and light microscopic features of reproductive system with their functions and apply this knowledge in relevant clinical conditions encountered in subsequent years of training and practice.
- Relate the basic knowledge of nucleotide metabolism, Molecular medicine and Genetics, Xenobiotics, Cancer & aging and Antioxidants & free radicals with their clinical significance Apply their relevant knowledge of this module in subsequent years of clinical training and practice
- Explain the physiological mechanisms controlling the functions of Central Nervous System in relationship with sensory, motor and autonomic nervous system.

Integration of Disciplines in this Module



MODULE PLANNING COMMITTEE

Module Director	**Dr. Saadia Hafeez Qureshi**
Members	**Dr. Rafia Hussain** **Dr. Momina Qamar** **Dr. Rabeea Riaz**

Preamble

The Neurosciences module is 08 weeks' module that focuses on the study of nervous system. It is a cross-disciplinary field that evolves around the development and functioning of the nervous system along with the mechanisms that underlie neurological disease. This module provides exposure to the field in depth and breadth. Through this module, students will develop an integrated, scientific knowledge that will help them in clinical setting, plus creative and problem-solving skills.

module in subsequent years of clinical training and practice

ANATOMY				
Topic/ Theme	**Learning outcomes**	**Learning Objective/ Content**	**Instructional strategies**	**Assessment tool**
Introduction & organization ofthe nervous system	• Interpret the anatomical basis of common neurological clinical presentations by correlating the structures forming the nervous system with their functions • Demonstrate the structureof brain and spinal cord onprosected specimens and models • Identify the normal structure of brain and spinal cord in the imagesof CT scan & MRI • Correlate the developmental process ofnervous system with	**<u>Knowledge</u>** • List the major divisions,components and functions of the centralnervous system. • Enumerate ventricles and coverings of brain and spinal cord with special emphasis on intracranial hemorrhages. • Explain the process oflumbar puncture and enumerate the structures through which a needle will pass while performing spinal tap in an order.	SGDs	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

Gross Anatomyof skull	embryological basis of relevant congenital anomalies • Correlate the histomorphological features of nervous systemwith its functions and predict functional outcomes of their altered structure • Identify the histomorphological features of nervous systemunder light microscope by focusing the H&E stained	**<u>Knowledge and Skill</u>** • Demonstrate the anatomical position ofskull with special emphasis on planes ofanatomical position. • Describe and demonstrate the boundaries and grossfeatures of cranial fossae. • List and demonstrate foramina along with structures passing through them in anterior, middle and	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

	slides at different magnifications	posterior cranialfossae. • Recognize and demonstrate the important sutures, fontanelle and impressions on the interior of cranial vault • Identify important bony landmarks on thebones as viewed from lateral, superior, inferior, anterior and posterior views. • Identify the bones forming the boundariesof orbit, nasal cavity, oral cavity, temporal, infratemporal fossa & pterygopalatine fossa on the given bone. (Details to be done with relevant topics). • Explain the clinical presentations relevantto fracture of various bones of skull		

Gross Anatomyof Spinal cord		**Knowledge** • Explain the gross appearance and the nerve cell groups in theanterior, posterior and lateral gray columns of spinal cord • Enumerate and illustrate the arrangements of ascending and	SGD	MCQs / SEQs/ SAQs/ OSPE VIVA VOCE

		descending tracts (white matter) in spinalcord at various levels. • Explain the given clinical conditions related to ascending and descending tractsof spinal cord. ○ Pyramidal tracts(upper motor neuron) lesions ○ Extrapyramid altracts (upper motor neuron) lesions ○ Lower motor neuron lesions ○ Acute spinal cordinjuries ○ Spinal shock syndrome ○ Destructive spinalcord syndromes ○ Complete cord transection syndrome ○ Anterior cord syndrome ○ Central cord syndrome ○ Brown sequard syndrome		

		○ Syringomyelia ○ Poliomyelitis ○ Multiple sclerosis ○ Amyotrophic lateral sclerosis • Trace all ascending and descending pathways		

		of spinal cord with emphasis on location of first, second and third order neurons, functions and effects of lesions.		
Gross anatomyof the brainstem		**<u>Knowledge</u>** • Describe the gross appearance and internal structure of the medulla oblongata. • Illustrate the cross sections of medulla oblongata at differentlevels. • Explain the effects of raised pressure in posterior cranial fossaon the structures contained within it. • Apply the knowledgeof neuroanatomy to explain the followingclinical conditions: o Arnold-chiari malformation o Medial medullary syndrome o lateral medullary syndrome of Wallenberg. • Describe the gross	SGD	MCQs/ SEQs/ SAQs/ VIVA VOCE

		features and internalstructure of pons. • Illustrate cross sectionof pons at different levels showing major structures at each level.		

		• Analyze the anatomicalbasis of clinical presentation in case oftumors of pons, Pontine hemorrhage and Infarction of pons. • Describe the gross appearance and internal structure ofmid brain. • Describe vascular lesions of the midbrain • Illustrate cross sections at the level ofsuperior colliculus andinferior colliculus showing major structures at each level. • Justify the clinical presentation of blockage of cerebralaqueduct with anatomical basis. **Skill** • Identify the gross features of medulla, mid brain and pons on a given model.		

Gross anatomyof cerebellum & its connections		**Knowledge** • Describe the gross features of cerebellum. • Enumerate afferent and efferent fibers ofsuperior, middle and inferior cerebellar peduncles. • List intracerebellar nuclei and types of	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE
		fibers constituting white matter of cerebellum and explaintheir routes of entry and exit. • Explain the pathways carrying afferent andefferent fibers to and from the cerebellum. • List disturbances of voluntary movements, reflexes, ocular movements, speech, posture and gait resulting due to lesionsof cerebellum. • Apply the knowledge of anatomy to explain the cerebellar syndromes **Skill** • Demonstrate different parts of cerebellum ongiven model		

Gross anatomyof cerebrum		**<u>Knowledge and Skill:</u>** • Describe the topographic anatomyof diencephalon and demonstrate its grossfeatures on a given model. • List main sulci and gyriof cerebral hemispheres and describe the extent ofeach of them. • Explain the divisions of cerebral lobes on superolateral, medial	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		and inferior surfaces ofcerebral hemispheres. • Enumerate fibers making up the white matter of cerebral hemispheres and describe each of them. • Explain the effects oflesions of different parts of internal capsule • Explain the signs, symptoms, microscopicchanges, diagnosis and treatment of Alzheimerdisease. • Mark main sulci and gyri on lobes of cerebral hemispheres. • Identify commissural, projection and association fibers on brain prosected specimen • Describe and demonstrate the cortical functional areas in different lobesof cerebral hemispheres. • Describe the effects oflesions in the motor cortex on voluntary movements and		

		speech. • Describe the changes in personality due tolesions in the frontal		

		eye field of cerebral hemisphere. • Enumerate types of aphasia and describethe lesions of speechareas responsible for producing aphasia. • Explain the sign and symptoms due to lesions of sensory cortex, prefrontal cortex and somesthetic association areas. • Explain the effects of lesion in the primary and secondary visual cortex. • Illustrate diagrams showing probable pathways involved in reading a sentence andrepeating it out loud. • Illustrate diagrams showing probable pathways involved in hearing a question andanswering it. • Illustrate the lateral and medial views of cerebral hemispheres showing motor and sensory areas.		

Gross anatomyof reticular formation & limbic system		**<u>Knowledge:</u>** • Describe the general arrangement and functions of reticular formation.	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		• List afferent and efferent projections ofreticular formation • Enumerate components of limbic system and explain hippocampal formationwith reference to its afferent and efferent connections • Explain the effects ofdestruction of amygdaloid complexon behavior. **Skill:** • Identify different components of limbicsystem on given model.		

Gross anatomyof basal nuclei & their connections		**<u>Knowledge:</u>** • List terminology commonly used todescribe the basalnuclei. • Describe connectionsand functions of different nuclei constituting basal ganglia • List hyperkinetic disorders related with various basal nuclei likechorea, hemiballismus and athetosis • Describe Parkinsondisease regarding etiology, characteristics signs	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		and symptoms andtreatment **Skill:** • Identify different components of basalganglia on given model/specimen		

Gross anatomyof cranial nerves		**<u>Knowledge:</u>** • Enumerate the cranialnerves and classify them into sensory, motor and mixed nerves. • Describe the nuclei andintracranial course of all cranial nerves. • Apply the knowledge of neuroanatomy to explain the following clinical conditions regarding the lesions ofvarious cranial nerves: ✓ Unilateral/bilateral anosmia ✓ Lesions of visualpathway o Circumferentialblindness o Total blindnessof one eye o Nasal hemianopia o Bitemporal hemianopia o Contralateral homonymoushemianopia ✓ Diplopia ✓ Ptosis	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		✓ Internal and external ophthalmoplegia ✓ Double vision andits causes ✓ Trigeminal neuralgia ✓ Strabismus ✓ Facial nerve lesionsfrom brainstem to face ✓ Bell`s palsy ✓ Vertigo, nystagmus, tinnitus and deafness ✓ Manifestations of IX, X, XI, XII cranial nerve lesions **<u>Skill:</u>** Identify different cranialnerves on given model /specimen		

Gross anatomyof thalamus, Hypothalamus& their connections		**<u>Knowledge:</u>** • Enlist the divisions, nuclei and connectionsof thalamus. • List nuclei, functionsand connections of hypothalamus. • Describe the hypothalamohypophyial portal system and tract. • List the functions of main hypothalamic nuclei. • Describe the clinical presentation of following clinical disorders associated	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		with lesions of diencephalon : ○ Obesity and wasting ○ Sexual disorders ○ Hyper and hypothermia ○ Diabetes insipidus • Emotional disorders ○ Thalamic pain ○ Thalamic hand		

Gross anatomyof meninges and Dural venous sinusesof brain & spinal cord		**<u>Knowledge:</u>** • Define meninges of brain and describe thedural reflections in brain. • Explain the meningesof spinal cord • Enumerate the nervesand blood vessels supplying the meninges. • Define and enumeratepaired and unpaired Dural venous sinuses along with their attachments. • Describe the location,important relations, communications of cavernous sinus and enumerate structurespassing through it. • Describe the clinical presentation of following clinical disorders associatedwith meninges and Dural venous sinuses:	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		○ Epidural hemorrhage ○ Subdural hemorrhage ○ Subarachnoid hemorrhage ○ Cerebral hemorrhage **Skill:** • Demonstrate the supratentorial and infratentorial compartments of tentorium cerebelli in a prosected specimen.		

Gross anatomyof ventricular system, the CSF, & the blood-brain & blood-CSF barriers		**Knowledge:** • Describe the anatomical organization of ventricular system ofbrain and explain theboundaries of each ventricle along with their choroid plexus. • Explain formation, circulation and absorption of CSF. • Define arachnoid villous and explain the role of arachnoid villi inabsorption of CSF. • List the structures forming blood brain and blood CSF barriers • Explain causes &varieties of Hydrocephalus **Skill:**	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		• Identify the features ofvarious ventricles on models and prosected specimen. • Illustrate the floor offourth ventricle.		
Blood supply ofthe brain & spinal cord		**<u>Knowledge:</u>** • Describe the bloodsupply of differentparts of brain and spinal cord. • Explain the formationand importance of veins of brain. • Enumerate the vesselstaking part in the formation of circle of Willis and summarize its importance. • Relate the interruptionof cerebral circulation to cerebral artery syndromes due to anterior, middle and posterior cerebral artery occlusion. **<u>Skill:</u>** • Identify various bloodvessels of brain and spinal cord on modelsand prosected specimen. • Illustrate circle of Willis.	SGD	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

Development of central nervous systemand skull		**<u>Knowledge:</u>** • Describe the development of neuraltube with reference to neurulation, vesicles,	LGIS	MCQs/ SEQs/ SAQs/ OSPE/ VIVA VOCE

		brain flexures andventricles. • Describe the development and positional changes ofspinal cord. • Describe the formationand developmental changes in alar and basal plates. • Comprehend the embryological basis ofvarious types of Spinabifida. • Enumerate the derivatives of rhombencephalon, mesencephalon and prosencephalon. • Summarize the characteristic developmental eventsof the following o Medulla oblongata o Midbrain o Pons o Cerebellum o Pituitary gland o Supra renal gland o Diencephalon o Telencephalon • Apply the knowledgeof embryology to explain the clinical scenarios regarding: o Craniopharyngioma		

		s ○ Meningoceles ○ Meningoencephalocele		

		○ Meningohydroencephaloceles ○ Holoprosencephaly ○ Craniorachiscisis ○ Pheochromocytomas ○ Congenital megacolon ○ Anencephaly ○ Schizencephaly ○ Holoprosencephaly ○ Exencephaly ○ Hydrocephaly ○ Microcephaly • Describe the development of skull • Describe the importance of fontanelle of skull innew born with reference to: ○ Changes in intracranial pressure ○ Newborn Cranium. ○ Closure of different fontanelle • Explain the embryological basis ofcranioschisis and various types of craniosynostosis **Skill:** • Identify different partsof developing brain and spinal cord on thegiven model / diagrams.		

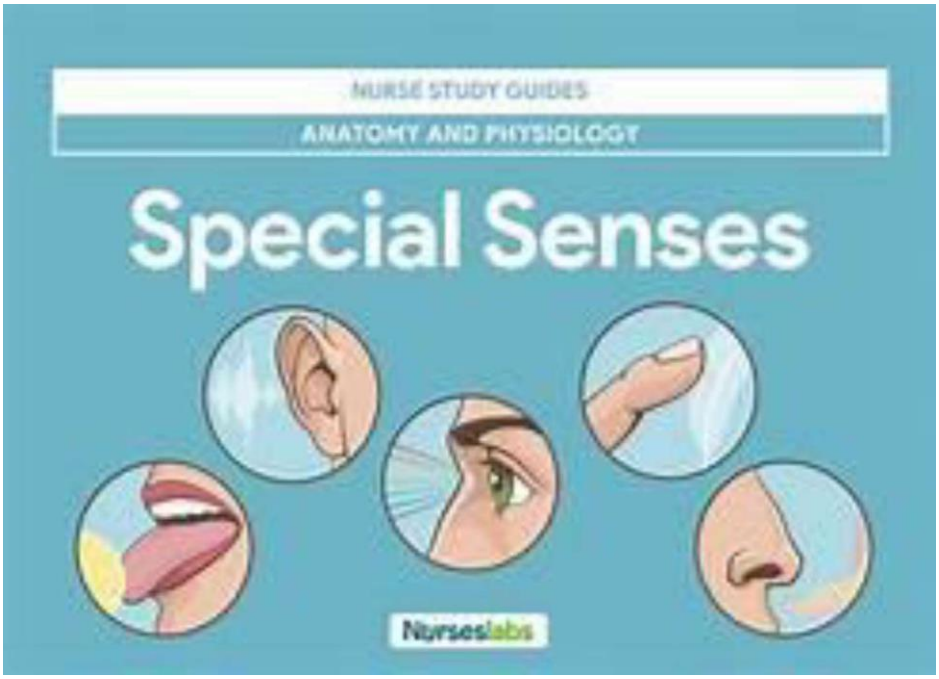
Histology of nervous tissue		**<u>Knowledge:</u>** • Summarize the histological features	LGIS	MCQs / SEQs/ SAQs/

		and functions of neuron and neuroglia. • Classify neurons according to their morphology and functions with oneexample of each. • Define neuroglia andlist its main types. • Explain the histomorphologic alcomposition of peripheral nerve. • Define ganglia. Differentiate between sensory and autonomicganglia in tabulated form. • Describe the histological features ofwhite and grey matterof spinal cord. • Enumerate layers of cerebral and cerebellarcortices and different cell types of these layers.		OSPE/ VIVA VOCE

		Skill: • Recognize various slides of nervous system by focusing them under the light microscope at various magnifications. • illustrate histological features of peripheral nerve, ganglia, spinal cord, cerebrum and cerebellum under lightmicroscope and enlist two points of identification for each.	Practicals	OSPE/ Long slides

BLOCK-VI

- Special Senses
- Endocrinology & Reproduction (ENR)
- Head & Neck



1. Introduction:

This block comprises of following modules:

Special Senses/Endocrinology & Reproduction (ENR) /Head & Neck

2. Duration:

Total duration of the block is 12 weeks. 10 weeks are for teaching and learning and 2 weeksare for end block assessment

3. Preamble

The emphasis of this module is on histo-morphological and embryological structure of specialsenses and endocrinology/reproductive system as well as the mechanisms involved in regulating hormone levels in an integrated manner. This module also includes the role of nutrition in different metabolic disorders and allows students to appraise integration and regulation of metabolic pathways in different tissues. Learning process involves delivering the content with clinical relevance. This makes medical student to understand the importance of Central Nervous system in the fields of Medicine. The research methodology, Behavioral Sciences & Professionalism will be taught as a part ofthe longitudinal theme.

Learning Outcomes

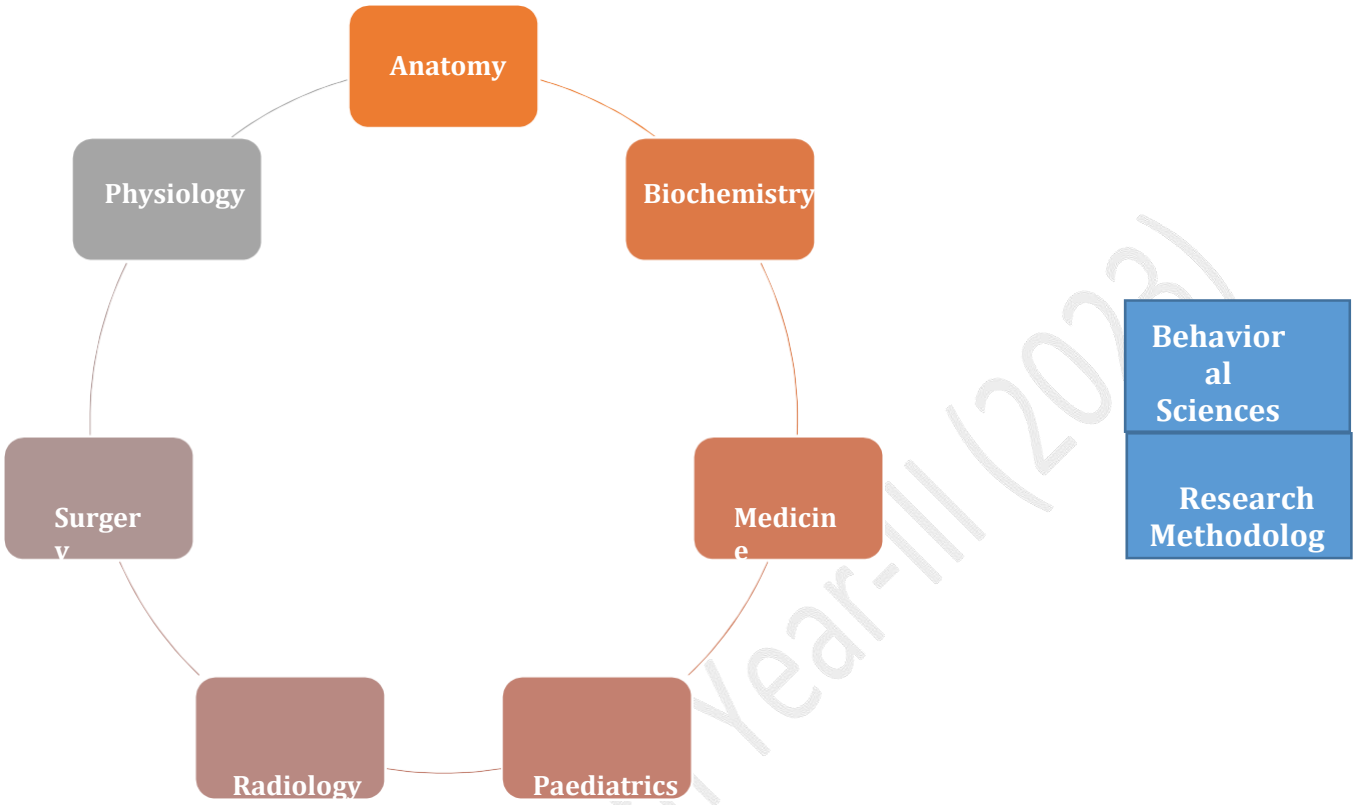
At the end of this module, student will be able to:

- Differentiate between H&E stained slides of specials senses, endocrine glands, integumentary system and oral cavity to predict functional outcomes that result from theiraltered structure and function.
- Correlate the embryological basis of specials senses, head and neck and integumentary system with various relevant congenital anomalies.
- Apply the concepts of gross anatomy of bones, viscera, muscles, neurovascular components and joints of head and neck to deal with the common prevalent diseases in future.
- Utilize the knowledge of gross anatomy, arterial supply venous drainage and lymphatic drainage of the head and neck with special emphasis on the spread of infection from face to brain.
- Correlate the physiological and biochemical concepts related to special senses and endocrinology/reproductive system with their anatomical knowledge
- Appraise the integration and regulation of metabolic pathways in different tissues
- Apply the knowledge of nutrition for better understanding of relevant disorders
- Relate their relevant knowledge of this module in subsequent years of clinical training andpractice
- Describe the physiology of special senses including their nervous pathways and interpretthe abnormalities related to them.
- Explain the basic principles of endocrinology along with the functions and related abnormalities of various endocrine glands.
- Describe the male and female reproductive functions and their abnormalities.

MBBS YEAR II

BLOCK VI
MODULE XI
Maxillofacial & Special Senses
Duration : 06 weeks

Integration of Disciplines in this Module



MODULE PLANNING COMMITTEE

Module Director	Dr. Saadia Hafeez Qureshi
Members	Dr. Rafia Hussain Dr. Momina Qamar Dr. Rabeea Riaz

Preamble

The Maxillofacial & Special Senses module for 2nd year MBBS aims to integrate both basic and clinical sciences. In basic sciences, students will be able to explain developmental, gross and microscopic anatomy of the Head Region & Special Senses along with relevant physiology and biochemistry. Learning process involves delivering the content with clinical relevance. The research methodology and Behavioral Sciences will be taught as a part of the longitudinal theme.

Learning Outcome:

By the end of this module, student should be able to correlate the physiological and biochemical concepts related to maxillofacial and special senses with their anatomical knowledge and apply theirrelevant knowledge of this module in subsequent years of clinical training and practice

ANATOMY				
MAXILLOFACIAL				
Theme/Topics	**Learning outcome**	**Content**	**Instructional strategies**	**Assessmenttool**
Skull	• Apply the knowledge of Gross Anatomy of head & special sense organs in interpretingthe anatomical basis of relevant clinical scenarios. • Demonstrate the topographic anatomyof structures of head and special senses onthe prosected specimens and models • Outline the main glands, nerves and vessels in the regionof head on the surface of given subject exhibiting effective communication, professionalism andethics. • Identify the normal radiographic appearance of tissuesin the region of head on the given radiographs in interpreting the anatomical basis of relevant clinical scenarios.	• Revisit the general plan ofstudying skull from different views. • Identify Individual bones ofmaxillofacial region • Revisit important bony landmarks on the bones asviewed from lateral, superior, inferior, anterior and posterior views. • List structures traversingthe foramina in these bones • Identify the bones formingthe boundaries of orbit, nasal cavity, oral cavity, temporal, infratemporal fossa &pterygopalatine fossa on the given bone. (Detail to be done with relevant topics. Already covered with neurosciences)	SGD (Small Group Discussion)	MCQ/ SAQ/OSPE Viva
Mandible		• Identify parts of mandible • Describe ramus and bodyof mandible with respect	SGD (Small Group Discussion)	MCQ/ SAQ/OSPE Viva

		to its bony features andattachments. • Explain the anatomical basis of Clinical presentation of different fractures of mandible		
Scalp		• Enumerate layers of scalpin a sequential order • Correlate gross features ofeach layer with anatomicalbasis of black eye, profuse bleeding, gaping wound, spread of scalp infection and shape of hematoma.	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
Face		• Elucidate the cutaneousinnervation of face • Group facial muscles according to the orificesthey are guarding • Describe the nerve supplyof muscles of facial expressions. • Describe the course of arteries, veins, lymphatics and nerves of the face withthe help of model. • Correlate gross features offace with anatomical basisof danger area, trigeminal neuralgia, facial/Bell's palsy. • Explain the anatomical basis of following clinical conditions relevant to face. o Facial lacerations andincisions o Compression of facialartery	SGD and dissectio n	MCQ/ SAQ/OSP E Viva

		Skill:		

		• Identify muscles of facialexpressions • Illustrate the cutaneousinnervation of face • Feel the pulsation of arteries on face		
Parotid region		• List contents of parotidregion • Elucidate the surfaces, borders, shape, location,parts, relations and drainage of parotid gland • Trace the pathway ofautonomic supply of parotid gland. • Enumerate structures embedded in parotid glandin a sequential order. • Correlate the extracranial course of facial nerve withBell's palsy. • Interpret the following clinical conditions relatedto face: o Infection, tumor and stone of parotid gland o Frey's Syndrome	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
Facial nerve		• Revisit the course and distribution of facial nerve • Revisit the relationship offacial nerve with pterygopalatine and submandibular ganglia • Revisit the effects of lesionof facial nerve at	LGIS	MCQ/ SAQ/OSP E Viva

		different levels		
Temporomandibular joint		• Describe the type, articular surfaces, capsule, ligaments, supporting	SGD and dissection	MCQ/ SAQ/OSPE Viva

		factors, movements andnerve supply of TMJ • Describe movements of TMJ with reference to axesand muscles producing them • Correlate a case of dislocation and reductionof TMJ with anatomical knowledge of TMJ. • Apply the knowledge ofanatomy to explain following nerve blocks o Mandibular and o inferior alveolar nerveblock		

Temporal and Infra-temporal region		• Identify the location, boundaries, contents andcommunications of temporal and infratemporal fossa on a given model and skull. • Describe the course and distribution of mandibularnerve from origin to distribution • Tabulate the attachments, actions and nerve supply ofmuscles of mastication. • Trace location, various routes and distribution ofotic ganglion • Justify role of lateral pterygoid as a peripheral heart on anatomical basis of pterygoid venous plexus • Elucidate importance of pterygoid venous plexus in case of intracranial spread	SGD and dissectio n	MCQ/ SAQ/OSP E Viva

		of infection to cavernoussinus. • Trace origin and distribution of superficial temporal, First and secondparts of maxillary artery • Trace origin and distribution of Chorda tympani from origin to till it joins the lingual nerve.		
Pterygopalatinefossa		• Identify the location of pterygopalatine fossa onskull • List bones forming walls ofpterygopalatine fossa • Enumerate its contentsand communications • Describe the distribution ofthird part of maxillary artery, nerve and pterygopalatine ganglion • Justify the role of pterygopalatine ganglion inhay fever/allergies	SGD and dissection	MCQ/ SAQ/OSPE Viva

Pharynx		• Differentiate extent, anatomical features, vascular supply, nerve supply of three parts ofpharynx on anatomicalbasis • List muscles of pharynxwith nerve supply and action • Enumerate structures passing through the spacesbetween muscles of pharynx • Describe anatomical route of spread of infections	SGD and dissectio n	MCQ/ SAQ/OSP E Viva

		from nasopharynx tomiddle ear. • Relate boundaries of tonsillar fossa and tonsillarbed with significant structures that must be protected during tonsillectomy		
Cranial nerves		Apply the knowledge of anatomy to explain the extracranial course of - cranial nerves (V, VII, IX, XII)	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
Radiography		Identify the important bonylandmarks of skull and mandible on X ray.	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
Surface markin g		• Mark following structureson subject • Parotid Gland and duct • Facial artery and nerve • External jugular vein	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
SPECIA L SENSES : Oral Cavityand tongue		• Identify the floor, roof, lateral walls and vestibuleof oral cavity. • Describe topographicfeatures of tongue. • Tabulate the actions and nerve supply of muscles (intrinsic and extrinsic) oftongue • Differentiate a case of UMN and LMN lesion of hypoglossal nerve (courseand branches) • Correlate Lymphatic drainage of different partsof tongue with spread of malignancy and infection	SGD and dissectio n	MCQ/ SAQ/OSP E Viva

		of tongue.		

		• Tabulate the attachments, nerve supply, actions ofmuscles of soft palate.		
Salivary glands		• Describe the location of major salivary glands (anatomical relations) along with opening of theirducts. • Trace the secretomotornerve supply of major salivary glands. • Discuss the anatomical basis of clinical presentation of mumps • Justify involvement offacial nerve in variousclinical conditions of Parotid gland • Enumerate the structure endangered by the stone in submandibular duct and its surgical removal	SGD and dissectio n	MCQ/ SAQ/OSP E Viva

Nose and paranasal sinuses		• Describe the skeletal framework of differentwalls of nose • Describe the features, vascular supply, nerve supply and openings in lateral wall of nose • Describe the features, vascular supply, nerve supply of medial wall ofnose • Highlight the significance of little's area in a case of epistaxis • Apply the knowledge of anatomy to explain clinical presentation of sinusitis	SGD and dissection	MCQ/ SAQ/OSPE Viva

External Ear		• Describe the gross anatomical features of auricle, external auditorymeatus and tympanic membrane. • Correlate nerve supply of external ear and tympanic membrane with clinical significance (perforation of tympanic membrane)	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
Middle ear		• Describe the gross anatomical features, boundaries, structures andcontents of middle ear cavity. • Describe the structures forming the walls of middleear cavity on the given model. • Highlight the importanceof infection in middle earcavity in relation to its communications. • Apply the knowledge of anatomy to explain following clinical conditions - Otitis media and mastoiditis, Blockage of pharyngotympanic tube	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
Inner ear		• Identify the bony and membranous parts of innerear on model • Apply the knowledge ofanatomy to explain following clinical conditions - Motion sickness, Hearing loss, Meniere disease	SGD and dissectio n	MCQ/ SAQ/OSP E Viva

Orbit		• Describe the skeletal framework of bony orbitand its communications • List the contents of orbit • Identify the parts ofeyeball on a model • Tabulate the attachments, nerve supply and actions ofextraocular muscles • Justify the movements of extraocular muscles basedon their attachments • Trace the course and distribution of 3, 4 and 6CNs • Trace the route and distribution of ciliaryganglion. • Describe the course and distribution of ophthalmicnerve • Enumerate different components of lacrimalapparatus • Describe the nerve supplyof Lacrimal gland • Define Horner's Syndrome • Apply the knowledge of anatomy to explain retinaldetachment	SGD and dissectio n	MCQ/ SAQ/OSP E Viva
EMBRYOLOG Y				

Development ofHead Region	• Correlate the development events of head and neck andspecial sense organs with embryological basis of their related congenital anomalies	• List embryological sourcesof head and neck structures • List components of pharyngeal apparatus. • Tabulate the nerve supply and derivatives of all	LGIS	MCQS/ SAQS/ SEQS/ OSPE Viva

	• Explain the development events of integumentary system and embryological basis of their related congenital anomalies	arches, pouches, clefts andmembranes • Describe the embryologicalbasis of first arch syndromes (Treacher Collins , Pierre Robin , DiGeorge and Goldenhar) • Apply the knowledge of developmental anatomy toexplain Branchial fistulas, sinuses and cysts • Correlate the normal development of tongue with its congenital anomalies (tie, macro-andmicro- glossia and bifid tongue) • Correlate the normal development and descentof thyroid gland with its associated anomalies • Justify the relative anatomical location ofparathyroid gland • Apply the knowledge of developmental anatomy toexplain ectopic thyroid tissue • Outline the developmentof nose and paranasal sinuses • Enumerate the prominences of facialdevelopment • Elucidate the embryological phenomenon of development of face, and		

		palate		

		• Correlate various facial andpalatal clefts including anterior and posterior clefts of lip and palate withnormal development • Apply the knowledge of developmental anatomy toexplain anomalies of nasolacrimal duct • Justify the association of Neural crest cells andcraniofacial defects		
Special Senses: Development ofEar		• Revisit the role of first andsecond pharyngeal apparatus in developmentof ear. • Describe the differentiation of oticcapsule into inner ear • Correlate the anomalies ofexternal ear with neural crest cells (deafness and external ear abnormalities)	LGIS	MCQS/ SAQS/ SEQS/ OSPE Viva
Development ofEye		• Describe the developmentof the optic cup • Relate the differentiationof wall of optic cup into definitive structures • Correlate the common congenital anomalies of eye (colobomas, congenitalcataracts, cyclopia) with normal development. • Describe the development	LGIS	MCQS/ SAQS/ SEQS/ OSPE Viva

		of various layers of eyeball		
Development of Integumentary System		• Describe the developmentof skin, hair, nails, mammary gland	LGIS	MCQS/ SAQS/ SEQS/ OSPE Viva

		• Describe the embryologicalbasis of relevant congenital anomalies (vitiligo, ichthyoses, disorders of keratinization, Hypertrichosis, hemangiomas and dermatoglyphics and mammary gland anomalies)		

HISTOLOGY

Topic / theme	**Learning outcomes**	**Course content/learningobjectives**	**Instructional strategies**	**Assessmenttool**
Histology of Lip &Tongue	• Explain the histomorphologic al features of lips,tongue, salivary glands and specialsense organs and corelate with their function. • Identify the slidesof special sense organs, lip, tongue, salivary glands under lightmicroscope at different magnifications • Explain the normal histomorphological features of integumentary system	• Describe the histological features oflip, with emphasis on transition in structure from cutaneous to vermillion to mucosal zone. • Explain the histologicalfeatures of dorsal and ventral surfaces of tongue, with particularfocus on tongue papillae, their shape, location, keratinization, numberand presence or absence of taste buds. • Identify H&E Stained slides of lip and tongue and draw theirlabelled diagrams.	LGIS Practical	MCQs/SAQs / SEQs/OSPE Viva

Histology of SalivaryGlands	• Identify the slidesof integumentary system under light microscope at different magnifications	• Classify salivary glandson basis of morphology and nature of secretion • Describe the histo-morphological features of salivary glands with regards totheir secretory and ductal systems	LGIS Practical	MCQs/SAQs / SEQs/ OSPE Viva

		• Identify H&E Stained slides of parotid gland,submandibular gland and sublingual glands and draw their labelled diagrams.		
Histology of Ear		• Identify the histological structure of different parts of ear, particularly the external and internal ear. • Describe the histological structure of sensory receptor areas of internal ear like Organ of Corti, maculae acousticae and crista ampullaris. • Identify H&E Stained slide of pinna and cochlea and draw their labelled diagrams	LGIS Practical	MCQs/SAQs / SEQs/ OSPE Viva
Histology of Eye		• Describe the detailed structure and functionof sclera and cornea, with special emphasis on corneal transparency and its fusion with sclera at corneoscleral junction. • Describe the light microscopic structureof uveal tract, different layers of retina, correlating the arrangement of neuronal cells and processes with their functions. • Describe and correlatethe gross anatomical structure of eyelid	LGIS Practical	MCQs/SAQs / SEQs/ OSPE Viva

		with its histological structure.		

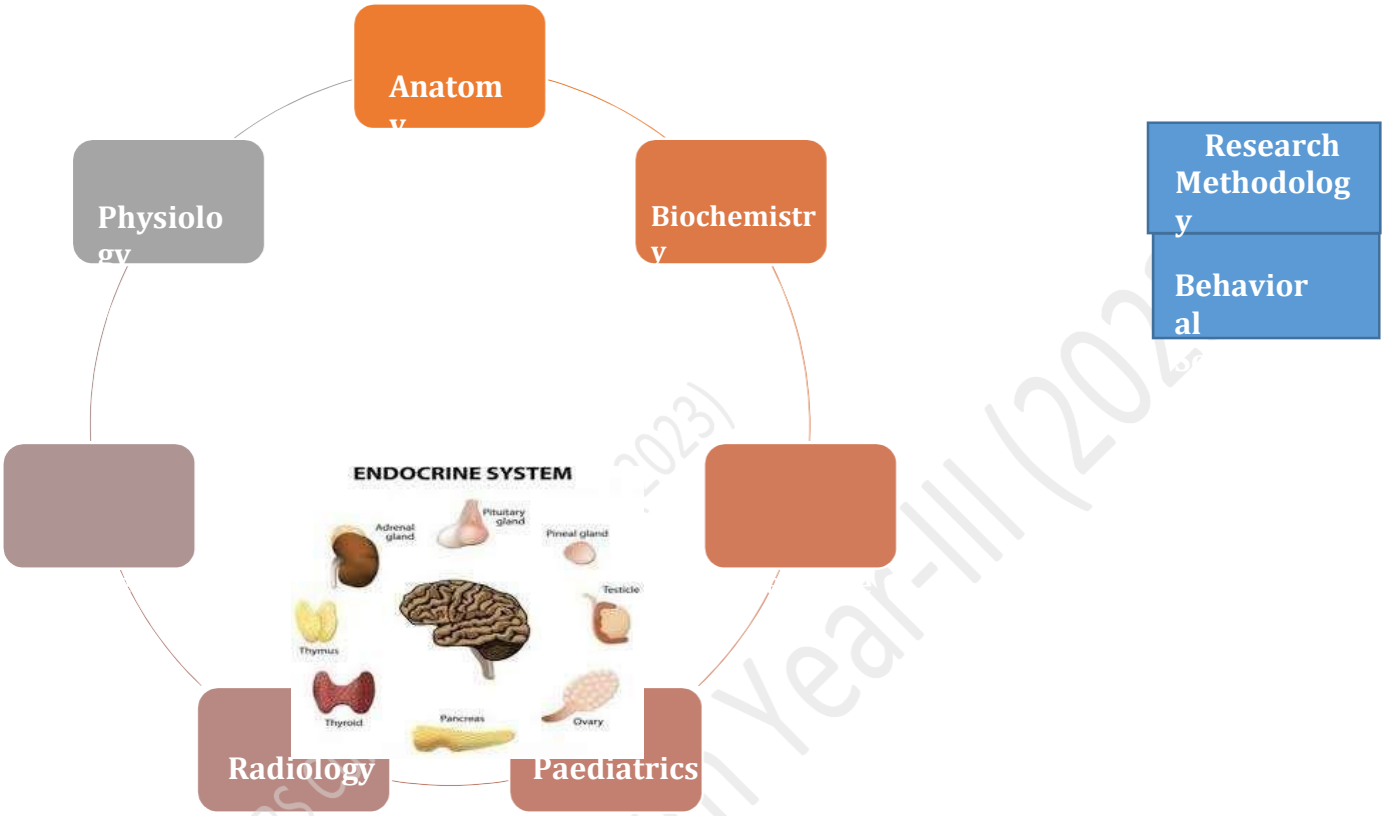
		• Identify H&E Stainedslide of cornea and draw their labelled diagrams.		
Histology of Integumentarysystem		• Describe the components of skin, its epithelium (epidermal cells with functions) and appendages (nails, hairand mammary gland) • Explain histological differences betweenthick and thin skin. • Describe histologicalbasis of psoriasis, vitiligo, albinism, blister disorders and cancers of skin • Describe the histological differencesof mammary gland between inactive, active and lactating phase • Describe the involution of mammary gland in oldage • Describe the histological basis of carcinoma of mammary gland (part of parenchyma mostlyinvolved-intraductal carcinoma). • Identify an H&E Stained slides of thick and thin skin and mammary gland (inactive and active phases) and draw	LGIS Practical	MCQs/SAQs / SEQs/ OSPE Viva

		theirlabelled diagrams		

BLOCK VI
MODULE XII
Endocrinology
Duration: 05 weeks

Integration of Disciplines of this Module

MODULE PLANNING COMMITTEE



Module Director	**Dr. Saadia Hafeez Qureshi**
Members	**Dr. Rafia Hussain** **Dr. Momina Qamar** **Dr. Rabeea Riaz**

Preamble

The emphasis of this module is on histo-morphological and embryological structure of endocrinology system as well as the mechanisms involved in regulating hormone levels in an integrated manner. Similarly, this module of endocrine system will enable the students to recognize the clinical presentations of common endocrinological and metabolic disorders and relate clinical manifestations to basic sciences. This Endocrine module will be revisited in the following years. The research methodology and Behavioral Sciences will be taught as a part of thelongitudinal theme.

Learning Outcome:

By the end of this module, student should be able to correlate the physiological and biochemical concepts related to genitourinary system with their anatomical knowledge and apply their relevant knowledge of this module in subsequent years of clinical training and practice

ANATOMY				
TOPICS	**OUTCOMES**	**Course content**	**Learning Strategies**	**Assessment tools**
***GROSS ANATOMY OFNECK: Hyoid bone &*Cervical vertebrae**	• Apply the knowledge ofGross Anatomy of neck & endocrine organs in interpreting the anatomical basis of relevant clinical scenarios. • Demonstrate the topographic anatomy of structures of neck on theprosected specimens and models • Outline the main glands,nerves and vessels in theregion of neck, on the surface of given subject exhibiting effective communication, professionalism and ethics. • Identify the normal radiographic appearanceof tissues in the region of neck on the given radiographs	• Explain the gross features and attachments of hyoid bone • Give distinguishing features of each cervicalvertebra. • Enumerate structures passing through foramina • Identify type and movements of atlantoaxial and atlantooccipital joints • Outline ligamentous attachments on cervical vertebrae.	SGD (Small Group Discussion)	MCQ/ SAQ/OSPE Viva
Superficial Fascia		• Outline contents of superficial fascia of neck(platysma, external jugular vein) • Illustrate cutaneous innervation of neck	SGD and dissection	MCQ/ SAQ/OSPE Viva

Deep cervical fascia		• Enumerate the layers ofdeep cervical fascia. • Trace the attachments ofinvesting, pre-tracheal, carotid sheath and prevertebral layers of fascia. • Identify various modifications and neck spaces formed by fascialattachments. • Comprehend the clinical importance of neck	SGD and dissectio n	MCQ/ SAQ/OSPE Viva

		spaces in spread of infection		
Triangles of neck		• Tabulate the attachments, nerve supply, actions of superficial and deep muscles of neck (sternocleidomastoid, suprahyoid, infrahyoid, sub occipital, prevertebralmuscles,). • Identify boundaries and contents of triangles of neck on model • Describe the origin, course and distribution ofvessels and nerves of neck (cervical plexus, Ansa cervicalis, Common carotid artery, Internal jugular vein, subclavian vessels) • Analyze a case of lesion ofaccessory, glossopharyngeal and vagus nerve on anatomical basis. • Describe the clinical features of torticollis	SGD and dissectio n	MCQ/SAQ/OS PE Viva
Submandibul arregion		• Revisit boundaries of submandibular triangle • Describe the parts, relations, neurovascular supply of submandibular gland. • Trace the roots of submandibular ganglion	SGD and dissectio n	MCQ/ SAQ/OSPE Viva

		• Describe the distribution of		

		submandibular ganglion • Correlate the anatomy ofsubmandibular fascial space with Ludwig's angina		
Larynx		• Describe laryngeal wall indetail with emphasis on cartilages, ligaments, muscles, vascular supply and nerve supply. • Analyze mechanism of abduction and adductionof vocal cords • Distinguish clinical presentations of injury toexternal, internal and recurrent laryngeal nerves. • Recognize Clinical significance of piriformfossa • Apply the knowledge ofanatomy to explain: ○ Laryngoscopy ○ Aspiration of foreignbody from laryngopharynx	SGD and dissectio n	MCQ/ SAQ/OSPE Viva
Cervical part oftrachea, esophagus andcervical chain		Identify gross features of Cervical part of trachea, esophagus and cervical chainand relevant clinical conditions	SGD and dissectio n	MCQ/ SAQ/OSPE Viva
Thyroid and parathyroi dglands		• Identify gross features ofthyroid and parathyroid glands on models. • Describe capsule, relations and blood	Lecture, SGD,CBL and dissection	MCQ/ SAQ/OSPE Viva

		supply of thyroid andparathyroid gland • Justify anatomical basis ofmovement of thyroid gland during deglutition • Discuss surgical precautions in thyroid surgery while ligating vessels and enucleation • Correlate the compression/shifting of surrounding structures in case of benign and malignant enlargement ofthyroid gland in various directions		
Lymphatic drainage of neck		• Enumerate the groups oflymph nodes draining theneck. • Describe their locationand areas of drainage. • Describe the formation ofjugular lymph trunk. • Describe the clinical importance of `lymphatic drainage of neck.	SGD and dissectio n	MCQ/ SAQ/OSPE Viva
Great Vessels ofNeck		• Describe the course and branches/tributaries of the respective vessels: ○ Common carotidartery ○ External carotidartery ○ Internal carotid artery	SGD and dissectio n	MCQ/ SAQ/OSPE Viva

		○ Internal Juglar vein		
Cranial nerves		Revisit the course of X & XICNs and their distribution along with injuries	SGD and dissection	MCQ/ SAQ/OSPE Viva

Radiography		Identify the important bonylandmarks of hyoid bone cervical vertebrae on x ray.	SGD and dissectio n	MCQ/ SAQ/OSPE Viva
Surface marking		• Mark following structureson subject: ➢ Thyroid Gland ➢ Common carotidartery ➢ Internal jugular vein	SGD	MCQ/ SAQ /OSPE Viva
Gross Anatomy ofendocrine glands	•	• Define and classify theglands • Describe the location structure and function of all endocrine glands in the body	• Lectures • SGD • CBL	MCQ/SAQ/SE Q/ structured Viva
Pituitary gland		Describe the gross anatomy,neurovascular supply and clinical importance of pituitary gland	• Lectures • SGD • CBL	MCQ/SAQ/SE Q/ structured Viva
Parathyroi dglands		Describe the gross anatomy,neurovascular supply and clinical importance of parathyroid glands	• Lectures • SGD • CBL	MCQ/SAQ/SE Q/ structured Viva
Adrenal cortex		Describe the gross anatomy,neurovascular supply and clinical importance of adrenal gland	• Lectures • SGD • CBL	MCQ/SAQ/SE Q/ structured Viva
Pancreas		Describe the gross anatomy,neurovascular supply and clinical importance of endocrine portion of pancreas	• Lectures • SGD • CBL	MCQ/SAQ/SE Q/ structured Viva
EMBRYOLOGY				
ENDOCRINE GLANDS:				
Pituitary gland	Explain the developmentevents of endocrine organs/system and	Describe the development and congenital anomalies ofpituitary gland	• LGIS	MCQ/SAQ /SEQ/ structured Viva

Thyroid gland	embryological basis of their related congenitalanomalies	Describe the development and congenital anomalies ofthyroid gland (thyroglossal duct and other congenital abnormalities as congenital hypothyroidism, accessory thyroid and thyroid agenesis)	• LGIS	MCQ/SAQ /SEQ/ structure dViva
Parathyroi dglands		Describe the development and congenital anomalies ofparathyroid glands	• LGIS	MCQ/SAQ /SEQ/ structured Viva
Adrenal glands		Describe the development and congenital anomalies ofadrenal gland	• LGIS	MCQ/SAQ /SEQ/ structured Viva
HISTOLOG Y				
Endocrin eGlands: **Pituitary gland**	• Relate the histomorphological features of endocrinesystem with its functions • Identify the slides of endocrine system underlight microscope at different magnification	• Describe the microscopicfeatures of pituitary gland • Illustrate pituitary glandand write two points of identification	• LGIS • Practical	MCQ/SAQ /SEQ/ OSPE Viva
Thyroid gland		• Describe the microscopicfeatures of thyroid gland • Identify the slide of thyroid gland under lightmicroscope and illustrate thyroid gland and write two points of identification	• LGSI • Practical	MCQ/SAQ /SEQ/ OSPE Viva
Parathyroi dgland		• Describe the microscopicfeatures of parathyroid gland • Identify the slide of parathyroid gland underlight microscope and illustrate parathyroid gland and write two	• LGIS • Practical	MCQ/SAQ /SEQ/ OSPE Viva

		points of identification		

Adrenal gland		• Describe the microscopicfeatures of adrenal gland • Identify the slide of adrenal gland under light microscope and illustrate adrenal glandand write two points ofidentification	• LGIS • Practical	MCQ/SAQ /SEQ/ OSPE Viva
Endocrine part ofpancreas		• Revisit the microscopicfeatures of endocrine part of pancreas • Identify the slide of pancreas under light microscope and illustrate pancreas glandand write two points of identification	• LGIS • Practical	MCQ/SAQ /SEQ/ OSPE Viva

TABLE OF SPECIFICATIONS TOS

Theory Second Professional MBBS Examination (2023) ANATOMY

Marks of theory paper = 80
Time Allowed = 03 hrs
Internal assessment (20%) = 20
Total Marks (MCQs:40%+SEQs:40%+IA:20%) = 100
Pass Marks = 50
Paper-1: (*Marks of MCQ component shall be rationalized to 40% weightage)
60 x MCQs (1 mark each) (60 Marks) Time =60 min
Paper-2:
8x SEQs (5 Marks each) (40 Marks) Time = 120 min
*If a candidate obtains 50 marks is MCQs it will be rationalized as: (50/60*40=33.33)

Note: 1. ***Please make sure that MCQs selection shall be done keeping in mind this specific distribution*** 2. ***1 x SEQs each out of 07 will be from whole histology & Embryology***	**Number of MCQ's (60)**			**Number of SEQs (8) x5 Marks each**
	Total No.	**Recall: 18**	**Application :42**	
Histology	**10**	5	5	1
Embryology	**12**	3	9	1
Abdomen (Gross)	**14**	4	10	1
Genitourinary System(Gross)				1
Head (Gross)	**12**	3	9	2
Neck (Gross)				
Neuroanatomy (Gross)	**12**	3	9	2

RECOMMENDED ANATOMY BOOKLIST 2023

<table>
<tr><th colspan="2">GROSS ANATOMY</th></tr>
<tr><th>Text Books</th><th>Reference Books</th></tr>
<tr><td>Clinically oriented Anatomy
By Keith L Moore (8th Edition)</td><td>LAST`s Anatomy Regional & Applied
(12th Edition)</td></tr>
<tr><td>Clinical Anatomy for medical students
By Richard S. Snell (10th Edition)</td><td>Gray`s Anatomy<br>By Henry Gray`s (41st Edition)</td></tr>
<tr><td>Cunningham`s manual of practical anatomy 15th Edition

Vol-1
(Upper limb & Lower limb)
Vol-2
(Abdomen & Thorax)
Vol-3
(Head & Neck, Brain) (Only For BDS)

Photocopy of "General Introduction" from Cunningham's manual Vol-I (Page 1-19) (Only For BDS)</td><td rowspan="2">Atlas of Anatomy
By Netter (7th Edition)/ Atlas of Anatomy
By Grant`s</td></tr>
<tr><td>Sketch book Gross</td></tr>
<tr><td rowspan="2">Clinical Neuroanatomy By Richard S. Snell (8th Edition) only for BDS</td><td>Atlas of Anatomy
By Netter (6th Edition)/ Atlas of Anatomy
By Grant`s</td></tr>
<tr><td>Museum Atlas</td></tr>
<tr><th colspan="2">HISTOLOGY</th></tr>
<tr><th>Text Books</th><th>Reference Books</th></tr>
<tr><td>Basic Histology
By Luiz carlos Junqeira (14th Edition)</td><td rowspan="3">Medical Histology by Prof. Laiq Hussain (6th edition)</td></tr>
<tr><td>Di-fiore`s Atlas of Histology (13th Edition)</td></tr>
<tr><td>Manual of Histology Vol – I
Manual of Histology Vol – II (for BDS only)
By Prof Dr Tassaduq Hussain Shaikh/
Contextual Journal of Histology</td></tr>
<tr><th colspan="2">GENERAL ANATOMY</th></tr>
<tr><th>Text Books</th><th>Reference Books</th></tr>
<tr><td rowspan="2">General Anatomy by Prof Laiq Hussain (5th edition)</td><td>General Anatomy
By Dr Tassaduq Hussain Shaikh(16th Edition)</td></tr>
<tr><td>General Anatomy
By Prof Dr Ghulam Ahmed (7th Edition)</td></tr>
<tr><th colspan="2">EMBRYOLOGY</th></tr>
<tr><th>Text Books</th><th>Reference Books</th></tr>
<tr><td>Langman's Medical Embryology(14th Edition)</td><td rowspan="2">Netter's Embryology Atlas</td></tr>
<tr><td>The Developing Human
By Keith L-Moore (11th Edition)</td></tr>
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