RAI FOUNDATION MEDICAL COLLEGE

ENDOCRINOLOGY & REPRODUCTION MODULE

SECOND YEAR MBBS, ACADEMIC SESSION 2025-26

BLOCK: V (Endocrinology & Reproduction- I)
Academic Year: 2025
Duration: 7 Weeks

DISCLAIMER

- Developing a study guide is a dynamic process and undergoes iteration according to the needs and priorities.
- This study guide is subjected to the change and modification over the whole academic year.
- However, students are advised to use it as a guide for respective modules.
- It is to declare that the learning objectives (general and specific) and the distribution of assessment tools (both theory and practical) are obtained from RAI FOUNDATION MEDICAL COLLEGE, Sargodha. These can be obtained from: https://www.uhs.edu.pk/
- The time tables are for guiding purpose. It is to advise that final timetables are always displayed over the notice boards of each lecture hall.
- Students are encouraged to provide feedback via module coordinator.

Vision Statement

To be an institution of excellence in medical education, research, and patient care, fostering innovation, compassion, and a profound commitment to addressing healthcare challenges at local and global levels.

Mission Statement

We are dedicated to producing competent, ethical medical graduates who exemplify empathy, social accountability, and excellence in patient care. Through innovative education and critical thinking, they will advance clinical practice, scientific research, and lifelong learning to meet local and global healthcare needs.

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Module Committee

Sr.no	Name	Department	Role
1.		Principal	
2.		DME	Director
3.		DME	Assistant Director
4.		DME	Senior Demonstrator
5.		Professor & HOD Biochemistry	Block Coordinator
6.		Professor Anatomy	Module Coordinator
7.		Asst Professor DME	Module Developer
8.		Senior Demonstrator	Module Developer
9.		Professor & HOD Anatomy	Member
10.		Professor Physiology	Member
11.		Professor & HOD Pharmacology	Member
12.		Asso. Prof. Physiology	Member
13.		Asst. Prof Pathology	Member
14.		Professor Medicine	Member
15.		Professor Surgery	Member
16.		Senior Lecturer	Member
17.		Community Medicine	Member
18.		Asst. Prof. Psychiatry (Behavioral Science)	Member
19.		SR Surgery (In charge Skill Lab)	Member

Introduction to Study Guide

It is an aid to Inform students how student learning program of the module has been organized, to help students organize and manage their studies throughout the module and guide students on assessment methods, rules and regulations.

The Study Guide:

— Communicates information on organization and management of the module.
— This will help the student to contact the right person in case of any difficulty.
— Defines the objectives which are expected to be achieved at the end of the module.
— Identifies the learning strategies such as lectures, small group teachings.

Module Outcomes:

— Provides a list of learning resources such as books, computer-assisted learning programs, web links, and journals, for students to consult in order to maximize their learning.
— Highlights information on the contribution of continuous on the student's overall performance.
— Includes information on the assessment methods that will be held to determine every student's performance.

Achievement of Objectives:

- Focuses on information pertaining to examination policy, rules and regulations.

Students will experience an integrated curriculum.

Integrated Curriculum:

An integrated curriculum is all about making connections, whether to real life or across the disciplines, about skills or about knowledge. An integrated curriculum fuses subject areas, experiences, and real-life knowledge together to make a more fulfilling and tangible learning environment for students. Integrated teaching means that subjects are presented as a meaningful whole. Students will be able to have better understanding of basic sciences when they repeatedly learn in relation to clinical examples. Case based discussions, computer-based assignments, early exposure to clinics, wards, and skills acquisition in skills lab are characteristics of integrated teaching program.

Marks Distribution

BLOCK V Endocrinology & Reproduction I & Head, Neck, Special Senses Module					
Theory	Part I - MCQs	85 Marks	**Practical**	OSPE	56 Marks
				OSCE	16 Marks
	Part II- SEQs	35 Marks		OSVE	48 Marks
	Internal Assessment	30 Marks		Internal Assessment	30 Marks
	Total	150 Marks		Total	150 Marks

Theme	Subject	MCQ (1 Mark)	SEQ (5 Mark each)	Marks	Oral / Practical / Clinical Exam			
					OSPE (08 Marks each)	OSCE (10 Marks each)	Structured OSVE (16 Marks each)	Marks
Normal Structure	Anatomy & Applied / Clinical	30	4	50	4	-	1	**56**
Normal Function	Physiology & Applied / Clinical	18	2	28	2	-	1	**32**
	Biochemistry & Applied / Clinical	11	1	16	1	-	1	**24**
Disease Burden & Prevention	Community Medicine Public Health	08	-	08	-	-	-	**-**
	Behavioral Sciences	04	-	04	-	-	-	**-**
Pathophysiology & Pharmaco-therapeutics	Pathology	12	-	12	-	-	-	**-**
	Pharmacology	02	-	02	-	-	-	**-**
CFRC	CFRC 1-1	-	-	-	-	1	-	**08**
PERLS	PERLS 1-1	-	-	-	-	1	-	**08**
		85	**7×5 = 35**	**120**	**08×7 = 56**	**2×08 = 16**	**3 × 16= 48**	**120**

Organization of Module

INTRODUCTION

Endocrinal system is a unique system consists of glands which control body systems through its secretions known as hormones. These chemical compounds known as hormones play an integral role in maintaining cell activity and organ functions through biochemical signals. Human reproduction is controlled by hormones released by gonads. Changes in hormonal levels can affect human fertility.

In this module the anatomy and physiology of the endocrine organs, functional biochemistry of the hormones secreted will be taught in integrated fashion with reference to common disease occurring in Pakistani community. This study guide has been developed to help guide you and keep you focused on the objectives for this module.

Welcome to the field of medicine and hope that the journey ahead will be exciting and fulfilling for you all!!

Teaching and learning strategies:

The following teaching / learning methods are used to promote better understanding:

1. Interactive Lectures
2. Hospital / Clinic visits
3. Small Group Discussion
4. Practical
5. Skills session in skill labs
6. Case-Based Learning (tutorials)
7. Directed Self-Learning

- **Interactive lectures:**
  An interactive lecture is an easy way for instructors to intellectually engage and involve students as active participants in a lecture - based class of any size.

- **Hospital / Clinic visits:**
  In small groups, students observe patients with signs and symptoms in hospital or clinical settings. This helps students to relate knowledge of basic and clinical sciences of the relevant module.

- **Small group discussion (SGD):**
  Students learn from each other. Everyone gets more practice at expressing their ideas. A two-way discussion is almost always more creative than individual thoughts. Social skills are practiced in a 'safe' environment e.g. tolerance, cooperation.

- **Skills session:**
  Skills relevant to respective module are observed and practiced where applicable in skills laboratory or Laboratories of various departments.

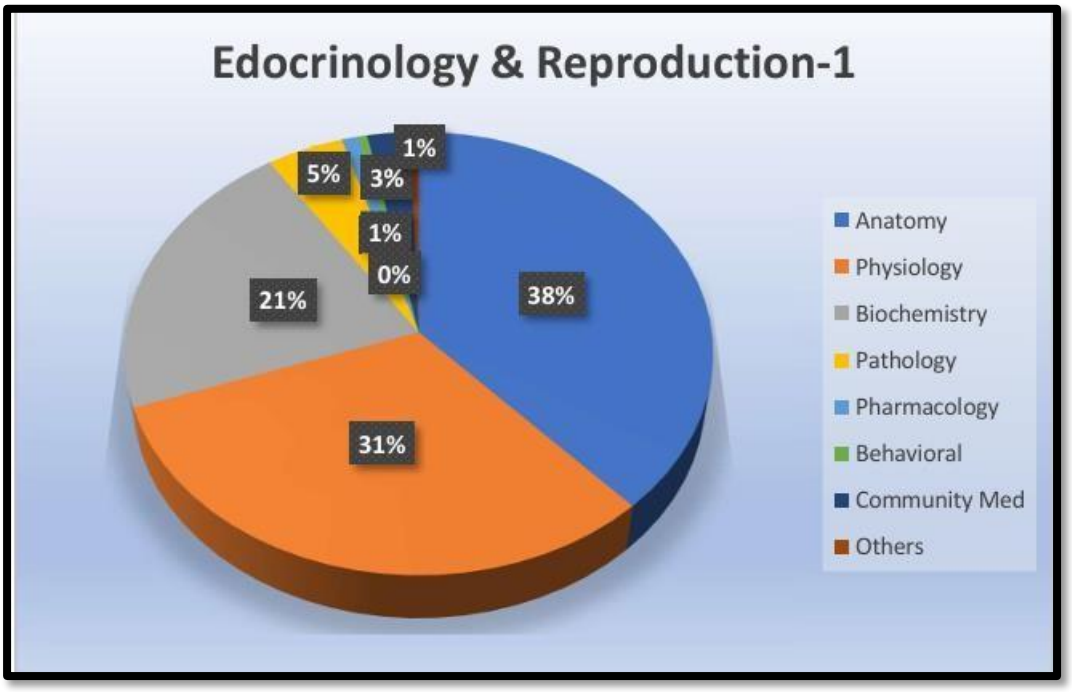
- **Case Based Learning (CBL):**

  A small group discussion format where learning is focused on a series of questions based on a clinical scenario. Students discuss and answer the questions by applying relevant knowledge

gained previously in clinical and basic health sciences during the module and construct new knowledge. The CBD will be provided by the concerned department. It is an active learning & teaching strategy which promotes application of foundational knowledge in relevant clinical scenarios.

- **Directed Self-learning (DSL):**
  Directed Self-learning, which involves studying with indirect supervision in a classroom/Library, is a valuable way to learn and is quickly growing in popularity among parents and students.
  Students' assume responsibilities of their own learning through individual study, sharing and discussing with peers, seeking information from Learning Resource Centre, teachers and resource persons within and outside the college. Students can utilize the time within the college scheduled hours of self-study.

INTEGRATING DISCIPLINES OF ENDOCRINOLOGY & REPRODUCTION- I MODULE



Module Outcomes

By the end of Endocrinology & Reproduction -1 module, students of 2nd year MBBS will be able to

- Explain the development, structure, hormones and regulation of pituitary gland, thyroid gland, parathyroid gland, endocrine pancreas, adrenal glands,
- Explain the development, structure, hormones and regulation of male and female reproductive organs.
- Describe the etiology, pathophysiology, relevant clinical features and common investigations of disorders of these glands.
- Apply levels of prevention for common endocrinal public health issues in Pakistan.
- Elaborate events in normal pregnancy.
- Discuss principles of genetics.

Themes of Endocrinology & Reproduction- I Module

S. No	Theme	Duration
1.	Introduction to Endocrinology & Signaling System	1 week
2.	Hypothalamus & Pituitary Gland	1 week
3.	Thyroid & Adrenal Glands	1 week
4.	Endocrine Pancreas	1 week
5.	Male Reproductive Organs	1 week
6.	Female Reproductive Organs	1 week
7.	Genetics	1 week

Specific Learning Objectives

ANATOMY				
GROSS ANATOMY				
ENDOCRINOLOGY LOs				
Topic	**Specific Learning objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Pituitary Gland	Describe the location, anatomy blood supply and functions of pituitary gland.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
Thyroid & Parathyroid Glands	Describe the Thyroid, Parathyroid with their type, Relations, blood supply, and nerve supply.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Explain the anatomical basis for surgical removal of the glands of neck with special emphasis on the complications that can be encountered.		C2	
	Identify the Thyroid gland with their type, relations, blood supply, and nerve supply in given model.		C2 / P2	
REPRODUCTION LOs				
Topic	**Specific Learning objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Testes	Describe the structure, fascia, coverings, blood and nerve supply of testis	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Describe the gross anatomical features and neurovasculature of epididymis and vas deferens, Seminal vesicles, Bulbourethral gland.		C2	
	Corelate the anatomical basis with manifestations of the following conditions: • Hydrocele of spermatic cord and/or testes • Hematocele of testes • Torsion of the spermatic cord • Varicocele Vestigial remnants of embryonic genital		C3	
	Describe the anatomical basis of vasectomy, metastasis of cancer of testis and scrotum.		C2	
Prostate Gland	Describe the morphological features and neurovascular supply of prostate.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Describe lobes of prostate gland with help of a labelled diagram.			
	Correlate the clinical manifestations of prostate with lobes and/or zones of prostate.		C3	
	Justify anatomically the clinical picture in Hypertrophy of Prostate.		C3	

Suprarenal Gland	Describe shape, relations blood supply & nerve supply of suprarenal gland.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Explain the anatomical causes of Adrenal Abnormalities		C2	
Pelvic Girdle	Define Bony Pelvis (Girdle).	SGD (Dissection Hall & Museum)	C1	MCQs, SEQs, OSVE, OSPE
	Describe the structures forming it.		C2	
	Describe the bones and salient anatomical features of Bony pelvis (girdle).		C2	
	Describe the anatomical basis of pelvic fractures and their consequences.		C2	
	Describe the topographical anatomy of pelvic walls and its components		C2	
	Describe the mechanics of changes occurring in pelvic ligaments and joint mobility in late pregnancy		C2	
Sacroiliac Joint	Describe the type, articulations and mechanics of movements {axes and planes} of the following joints: 1) Sacro-Iliac 2) Pubic Symphysis 3) Lumbosacral 4) Sacrococcygeal	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
Pelvis	List the contents of True and False Pelvis.	SGD (Dissection Hall & Museum)	C1	MCQs, SEQs, OSVE, OSPE
	Tabulate the differences between male and female pelvis.		C2	
	Discuss different types of pelvises.		C2	
	Explain different diameters of pelvis and their application in obstetric practice.		C2	
Pelvic Floor	Discuss the topographical anatomy of pelvic floor.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Describe origin, insertion, nerve supply and actions of Pelvic floor muscle forming pelvic floor.		C2	
	Tabulate the attachments, innervations and actions of muscles forming the pelvic walls and floor.		C2	
	Describe injury to pelvic floor during child birth and its complications.	Anatomy & Gynae	C2	
Peritoneum peritoneal cavity of	Describe the peritoneal reflections in the male and female pelvis.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Tabulate the differences in peritoneal reflections in male and female pelvis.		C2	
Sacrum	Discuss gross anatomical features of Sacrum.	SGD (Dissection Hall & Museum)	C2	
Pelvic Fascia	Describe the gross anatomical features of pelvic fascia.		C2	
Pelvic outlet and inlet	Describe the boundaries of pelvic outlet and inlet.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Enumerate the structures passing through the pelvic inlet and pelvic outlet.		C1	
Pelvic Vessels & Lymphatics	Describe the origin, course, branches and distribution of common iliac artery.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Discuss origin, course, branches and distribution of external and internal iliac		C2	

	arteries.			
	Describe the origin, course, tributaries and area of drainage of pelvic veins.		C2	
	Describe the location, afferents and efferent of pelvic lymph nodes.		C2	
	Tabulate the origin, course, distribution and anastomosis of arteries of the pelvis.		C2	
	Justify anatomically the clinical picture for ligation of internal iliac artery and collateral circulation in pelvis.		C3	
Pelvic Nerves	Describe the origin, root value, course, relations, branches and distribution of Pelvic nerves.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Describe the clinical picture and anatomical basis for the injury to pelvic nerves.		C2	
	Justify anatomically the rationale for pelvic nerve blocks.		C3	
Male Urethera	Describe the morphological features of urethra (male and female).	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Tabulate the parts of the male urethra with their location and salient features.		C2	
	Articulate the clinical picture and anatomical justification for Ureteric Caliculi, Cystocele, Suprapubic Cystotomy, Rupture of Bladder.		C3	
Female Reproductive Organs	Describe the gross anatomical features of Ovaries and Fallopian Tubes with their relations, blood supply, nerve supply and lymphatic drainage.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Delineate related clinical conditions: 1) Positions of ovaries 2) Cysts of ovaries 3) Ectopic pregnancy 4) Tubal ligation 5) Salpingitis	Anatomy & Gynae	C3	
	Describe the gross anatomical features, parts, peritoneal ligaments, blood supply, nerve supply & lymphatic & clinical aspects of Uterus and Vagina.		C2	
	Describe related clinical conditions 1. Prolapse of uterus 2. Vaginal trauma 3. culdocentesis		C3	
	Describe, identify, justify and demonstrate the supports of uterus.		C2	
Perineum	Describe the gross anatomical features of Boundaries & divisions of perineum.	SGD (Dissection Hall & Museum)	C2	MCQs, SEQs, OSVE, OSPE
	Draw with labels the boundaries of perineum.		C2	
	List the contents of perineum.		C1	
	Tabulate the differences between the Male and female perineum.		C2	
	Describe the attachments of the perineal membrane and list its relations.		C2	
	Discuss the formation of Superficial and		C2	

	Deep Perineal Pouches.			
	List the contents of Superficial and Deep Perineal Spaces.		C1	
	Tabulate the attachments, actions and nerve supply of muscles of perineum.		C2	
	Describe the topographical anatomy and neurovasculature of Penis.		C2	
	Tabulate the muscles forming the perineal body with their attachments and nerve supply.		C2	
Applied Anatomy of Pelvis	Correlate the clinical presentation and anatomical justification for: • Hypospadias • Phimosis • Circumcision • Erectile Dysfunction • Internal Hernias • Suprapubic Cystotomy • Rupture Of Bladder • Rectal Examination • Disposition of Uterus	SGD (Dissection Hall & Museum)	C3	MCQs, SEQs, OSVE, OSPE
EMBRYOLOGY & POST- NATAL DEVELOPMENT				
ENDOCRINOLOGY LOs				
Topic	**Specific Learning objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Thyroid Gland	Describe the contributing factors, histogenesis and sequence of events of the development of Thyroid gland.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Explain the embryological basis of the thyroglossal cyst.		C1	
	Draw a concept map highlighting the development of thyroid gland.		C2	
	Anatomically justify the clinical presentation of Aberrant Thyroid.		C3	
Parathyroid Gland	Describe the development of parathyroid glands.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Draw a concept map highlighting the development of para-thyroid gland.		C2	
	Anatomically justify the clinical presentation of ectopic parathyroid.		C3	
Pituitary Gland	Describe the development of pituitary gland.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Describe the embryological basis for the congenital anomalies of pituitary development.		C2	
	Describe the development of pituitary gland.		C1	
Adrenal Gland	Describe the contributing factors, histogenesis and the development of adrenal gland.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Draw a concept map for the development of adrenal gland.		C2	

	Describe the embryological basis for the congenital anomalies of adrenal development.		C2	
	Identify the stages in the development of the adrenal gland.		C2	
REPRODUCTION LOs				
Topic	**Specific Learning objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Gonads	Describe the indifferent gonads.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Describe the factors influencing the differentiation of gonads.		C2	
	Evaluate the role of the factors influencing Sex determination and differentiation.		C2	
Testes	Describe the development of inguinal canal and descent of testis.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Describe the embryological basis and locations of undescended testes.		C2	
	Draw a concept map highlighting the development of testis.		C2	
Female Reproductive Organs	Explain the Development and descent of ovaries.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Draw a concept map highlighting the development of ovaries.		C2	
	Justify the anatomical basis for indifferent gonads, Klinefelter, turner syndromes & androgen insufficiency.		C3	
	Describe the Formation of Genital Ducts In different stage (paramesonephric and mesonephric ducts).		C2	
	Describe the development of female genital ducts and glands, Development of uterus & Vagina.		C2	
	Describe related clinical anomalies and relate them with the given clinical scenarios. 1) Uterus Arcuatus 2) Uterus septus 3) Uterus Bicornis Bicollis 4) Uterus Bicornis Unicollis 5) Uterus Unicornis 6) Atresia of vagina 7) Double vagina 8) Imperforate hymen	Anatomy & Gynae	C2 / C3	
	Describe the development of male genital ducts.		C2	
External Genitalia	Discuss the Development of male external genitalia.	LGIS	C2	MCQs, SEQs, OSVE, OSPE

	Describe the Development of female external genitalia.		C2	
Applied Anatomy of Reproductive Organs	Rationalize the anatomical basis for the associated congenital anomalies of male and female external genitalia (Hyposidiasis, Epispidiasis).	LGIS	C3	MCQs, SEQs, OSVE, OSPE
	Justify embryologically the features & manifestations of Cryptorchidism, Ectopic Testis, Congenital Inguinal Hernia, Hydrocele Klinefelter, turner syndromes & androgen insufficiency.		C3	
	Describe the embryological basis for the coverings of testis		C2	
MICROSCOPIC ANATOMY (HISTOLOGY)				
ENDOCRINOLOGY LOs				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Pituitary Gland	Describe microscopic structure of Pituitary gland.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Classify pituitary gland on the basis of cell type, hormone produced and functions.		C2	
	Explain the histological basis and manifestation of Pituitary Adenoma.		C2	
Adrenal Gland	Describe the light microscopic structure of Adrenal Gland.	LGIS	C1	MCQs, SEQs, OSVE, OSPE
	Justify the histological basis and manifestation of Addison disease.		C3	
Pancreas	Describe the light microscopic structure of endocrine pancreas.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Classify the pancreatic islets on the basis of cell type, hormone produced and functions.		C2	
	Justify the histological basis and manifestation of Diabetes Mellitus.		C3	
	Explain the components and functions of neuroendocrine system.		C2	
Thyroid & Parathyroid Gland	Describe the light microscopic structure of Thyroid Gland.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Describe the light microscopic structure of Parathyroid Gland.		C2	
	Describe the light microscopic structure of Pineal gland.		C2	
REPRODUCTION LOs				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Testes	Describe the light and ultramicroscopic structure of Testes, structure & function of Sertoli cells.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Describe Blood testes Barrier		C2	

	Describe the histological basis and manifestation of Orchitis, Cryptorchidism		C2	
Epididymis	Describe the light microscopic structure of Epididymis.		C2	
Vas deferens	Describe the light microscopic structure of vas deferens.		C2	
Seminal Vesicle	Describe the light microscopic structure of seminal vesicle.		C2	
Prostate gland	Describe the light microscopic structure of Prostate Gland.	LGIS	C2	
	Describe the lobes of prostate and correlate with the pathologies of prostate.			
Ovaries	Describe the light microscopic structure of ovaries.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Describe the light microscopic structure of ovarian follicles in different stages of menstrual cycle.		C2	
	Describe the histological basis and manifestation of Polycystic Ovary Syndrome.		C2	
Uterus	Discuss the light microscopic structure of uterus.	LGIS	C2	
	Describe the light microscopic structure of different stages of Menstrual cycle.			
	Describe the histological basis and manifestation of Endometriosis.			
Fallopian Tube	Describe the light microscopic structure of Fallopian Tube.	LGIS	C2	
Cervix	Describe the light microscopic structure of Cervix.	LGIS	C2	
	Describe the histological basis and manifestation of Cervical Carcinoma.		C3	
Vagina	Describe the light microscopic structure of Vagina.	LGIS	C2	
Mammary Gland	Describe light microscopic structure of mammary gland (inactive, during pregnancy, after lactation).	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Discuss histological basis of Breast cancer.		C2	

MICROSCOPIC ANATOMY (HISTOLOGY) PRACTICAL

Topic	Specific Learning Objectives	Teaching strategy	Levels C/P/A	Assessment
Pituitary Gland	Identify Pituitary gland under light microscope.	Practical	C2 / P2	Integrated OSPE
	Draw a labeled diagram of the Pituitary gland.		C2	
Thyroid Gland	Identify thyroid & parathyroid glands under light microscope.	Practical	C2 / P2	
	Draw a labeled diagram of the thyroid & parathyroid glands.		C2	
Adrenal Gland	Identify the adrenal gland under light microscope.	Practical	C2 / P2	
	Draw a labeled diagram of adrenal gland.		C2	
Testes & Male	Identify Testes, Epididymis & Vas deferens under the light Microscope.	Practical	C2/P2	Integrated OSPE

Accessory Organs	Draw a labeled diagram of testes, epididymis & vas deferens.		C2	
	Identify the seminal vesicle & prostate gland under light microscope.	Practical	C2/P2	
	Draw a labelled diagram of seminal vesicle & prostate gland.		C2	
Ovaries	Identify the ovaries under light microscope	Practical	C2/P2	
	Draw a labelled diagram of ovaries.		C2	
Uterus & Fallopian Tube	Identify the slide of different phases of uterus and fallopian tube under light microscope.		C2/P2	
	Draw a labelled diagram of uterus & fallopian tube.		C2	
Cervix & Vagina	Identify the cervix & vagina under light microscope	Practical	C2/P2	
	Draw a labelled diagram of cervix & vagina.		C2	
Mammary gland	Identify the mammary gland (different stages) under light microscope	Practical	C2/P2	
	Draw a labelled diagram of mammary gland.		C2	

PHYSIOLOGY				
ENDOCRINOLOGY LOs				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Hypothalamus-Pituitary	Enlist the hormones/ factors of hypothalamus.	LGIS / SGD	C1	MCQs, SEQs, OSVE, OSPE
	Enlist the hormones of anterior pituitary.		C1	
	Enlist the hormones of posterior pituitary.		C1	
	Explain the significance of hypothalamic-hypophysial portal circulation.		C2	
Growth Hormone	Explain the mechanism of action of growth hormone.	LGIS	C2	MCQs, SEQs, OSVE
	Discuss the actions of growth hormone on carbohydrate metabolism.		C2	
	Discuss the actions of growth hormone on protein metabolism.		C2	
	Describe the actions of growth hormone on fat metabolism.		C2	
	Explain the effect of growth hormone on skeletal growth and age.		C2	
	Explain the significance of somatomedins in mediating the actions of growth hormone.	SGD	C2	
	Describe the regulation of Growth Hormone.		C2	
Applied Physiology of Pituitary Gland	Describe the causes and features and treatment of panhypopituitarism in adults and childhood.	LGIS	C1	MCQs, SEQs, OSVE

	Define Sheehan's syndrome.		C2	
	Enlist the types of dwarfism according to cause.			
	Explain the pathophysiology and features of gigantism and acromegaly.			
Posterior Pituitary	Explain the mechanism of action of antidiuretic hormone.	LGIS/ SGD	C2	MCQs, SEQs, OSVE
	Discuss the actions of antidiuretic hormone.		C2	
	Regulation of antidiuretic hormone production.		C2	
	Elaborate the mechanism of action of oxytocin.		C2	
	Discuss the actions of oxytocin.		C1	
Thyroid Gland	Discuss the transport of thyroid hormone	LGIS	C1	MCQs, SEQs, OSVE
	Discuss the mechanism of action of thyroid hormone		C2	
	Explain the actions of thyroid hormone on carbohydrate metabolism.		C2	
	Discuss the actions of thyroid hormone on protein metabolism.		C2	
	Explain the actions of thyroid hormones on fat metabolism.			
	Explain the non-metabolic functions of thyroid hormone.			
	Explain the regulation of thyroid hormone.			
	Enumerate antithyroid substances.			
	Explain mechanism of action of antithyroid substances.			
Thyrotoxicosis	Enumerate the causes of hyperthyroidism	LGIS / SGD	C1	MCQs, SEQs, OSVE, OSPE
	Explain the features, pathophysiology and treatment of thyrotoxicosis/ grave's disease		C2	
	Interpret the thyroid function test to investigate hypo and hyperthyroidism		C3	
	Enumerate the causes of hyperthyroidism		C2	
	Explain the features, pathophysiology and treatment of thyrotoxicosis/ grave's disease		C2	
	Discuss the site and role of erythropoietin in red blood cell production.		C2	
	Explain the significance of vitamin B12 and folic acid in maturation of red blood cell.		C2	
Hypothyroidism	Enlist the causes of hypothyroidism	LGIS/ SGD	C1	MCQs, SEQs, OSVE, OSPE
	Explain the features and pathophysiology of Hashimoto's thyroiditis.		C2	
	Discuss the features and pathophysiology and treatment of myxedema.		C2	
	Enlist the causes of cretinism.		C1	
	Discuss the features and pathophysiology of cretinism.		C2	
Goiter	Explain the pathophysiology and features of endemic colloid goiter.	LGIS	C1	MCQs, SEQs, OSVE

	Discuss the pathophysiology and features of nontoxic colloid goiter.		C2	
Adrenal Cortex	Name the hormones of adrenal cortex.	LGIS	C1	
	Explain the physiological anatomy of adrenal cortex.		C2	
	Explain the cellular mechanism of aldosterone action.		C2	
	Explain the effects of mineralocorticoid hormone.			
	Discuss the regulation of aldosterone secretion.			
	Discuss the metabolic and non-metabolic functions of cortisol.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Explain the interconversion of active cortisol and inactive cortisone by the 2, 11 beta hydroxysteroid dehydrogenase isoform.		C1	
	Explain the mechanism for regulation of glucocorticoid secretion by hypothalamus and pituitary.		C2	
			C2	
	Name adrenal androgens.	LGIS	C1	MCQs, SEQs, OSVE, OSPE
	Enlist the functions of adrenal androgens.		C1	
	Discuss the causes, features, pathophysiology and treatment of hypoadrenalism (Addison's disease).		C2	
Cushing Syndrome	Enlist the causes of hyperadrenalism.	LGIS/ SGD	C1	MCQs, SEQs, OSVE, OSPE
	Explain the features, pathophysiology and treatment of Cushing's syndrome.		C2	
	Differentiate between Cushing's syndrome and Cushing's disease.		C2	
	Explain the clinical importance of dexamethasone suppression test to diagnose Cushing's syndrome.		C2	
	Discuss the features, pathophysiology and treatment of Conn's syndrome.		C2	
Congenital Adrenal Hyperplasia	Enlist the cause, features and pathophysiology of congenital adrenal hyperplasia/ androgenital syndrome.		C1	
Adrenal Medulla	Enlist the functions of adrenal medullary hormones.	LGIS	C1	MCQs, SEQs, OSVE, OSPE
	Explain pheochromocytoma.		C2	
Pancreatic Hormones (Insulin)	Enumerate the types of pancreatic cells with their hormones.	LGIS	C1	MCQs, SEQs, OSVE, OSPE
	Explain the mechanism of action of insulin.		C2	
	Discuss the synthesis and mechanism of release of insulin.		C2	
	Explain the effects of insulin on carbohydrate, protein and lipid metabolism.		C2	
	Explain the effects of insulin on carbohydrate, protein and lipid		C2	

	metabolism.			
	Enlist the actions of insulin on liver, adipose tissue and skeletal muscle.	SGD	C1	
	Enlist the factors and conditions that increase or decrease insulin secretion.		C1	
	Explain the role of insulin (and other hormones) in "switching" between carbohydrate and lipid metabolism.		C2	
Glucagon & Regulation of Blood Glucose	Discuss the effects of glucagon on carbohydrate and lipid metabolism.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Explain the factors that regulate the secretion of glucagon.		C2	
	Explain the 24-hour regulation of glucose.		C2	
	Discuss the importance of blood glucose regulation.		C2	
	Explain the actions of somatostatin.		C2	
	Explain the 24-hour regulation of glucose.		C2	
Diabetes Mellitus	Enlist the types of diabetes mellitus.	LGIS	C1	MCQs, SEQs, OSVE, OSPE
	Explain the causes of Type I and type II diabetes mellitus.		C2	
	Discuss the features and pathophysiology of diabetes mellitus.		C2	
	Explain the role of insulin resistance, obesity and metabolic syndrome in developing type II diabetes mellitus.	CBL	C2	
	Explain how to diagnose the diabetes mellitus.		C2	
	Explain the treatment of type I and type II diabetes mellitus.		C2	
	Explain the features, cause of insulinoma.		C2	
Parathyroid Gland	Discuss the physiological anatomy of parathyroid gland.	LGIS	C2	MCQs, SEQs, OSVE
	Explain the rapid and slow mechanism of resorption of bone by parathyroid hormone.		C2	
	Discuss the actions of parathyroid		C2	
	Explain the control of parathyroid secretion by calcium ion concentration		C2	
Regulation of Calcium	Discuss the effects of Vitamin D	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Discuss the effects of calcitonin on calcium		C2	
	Discuss the regulation of calcium (the first & second line of defense)		C2	
REPRODUCTION LOs				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Male Reproductive System	Describe the hormonal factors that affect spermatogenesis	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Explain the maturation and storage of sperm in epididymis		C2	
	Discuss the structure and physiology of a mature sperm		C2	

	Describe the composition of semen		C2	
	Discuss the functions of prostate & seminal vesicles in the formation of semen		C2	
	Describe the composition of semen		C2	
	Explain the phenomenon of capacitation and acrosome Reaction along with their significance		C2	
	Discuss the role of pineal gland in reproduction.		C2	
Testosterone	Discuss the site of secretion of testosterone.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Name the active form of testosterone .		C1	
	Explain the production of estrogen in males.		C2	
	Describe the basic intracellular mechanism of action of testosterone.		C2	
	Explain the functions of testosterone in intrauterine life and after birth.		C2	
	Discuss the regulation of male sexual functions by hormones from the hypothalamus and anterior pituitary gland.		C2	
Female Reproductive System	Enumerate the phases of ovarian cycle.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Explain the phases of ovarian cycle along with the hormonal changes.		C2	
	Explain the postulated mechanism of ovulation.		C2	
	Explain the formation and involution of Corpus luteum		C2	
	Explain the structural and hormonal changes of endometrial cycle		C2	
	Explain the regulation of female monthly cycle		C2	
	Discuss the role of progesterone on female sexual organs		C2	
Ovarian hormones	Enumerate the ovarian hormones .	LGIS	C1	MCQs, SEQs, OSVE, OSPE
	Discuss the synthesis of estrogen and progesterone.		C2	
	Describe the interaction of follicular theca and granulosa cells for production of estrogens with the help of a diagram.		C2	
	Explain the functions of the estrogens on different organs Discuss the role of progesterone on female sexual organs.		C2	
			C2	
	Explain the physiological basis of puberty, menarche.		C2	
	Define menopause.		C1	
	Explain the cause of menopause.		C2	
	Discuss the physiological changes in the function of the body at the time of menopause.		C2	

Pregnancy & Lactation	Explain the non-hormonal functions of placenta.	LGIS	C2	MCQs, SEQs, OSVE, OSPE
	Explain the hormonal factors in pregnancy/ hormones of placenta		C2	
	Explain the changes in non- placental hormones during pregnancy		C2	
	Discuss response of the mother's body to pregnancy		C2	
	Explain the mechanical and hormonal factors that increase uterine contractility during parturition		C2	
	Explain the physiology of lactation .		C2	
	Discuss the actions of prolactin.		C2	
	Justify the suppression of ejection of milk during pregnancy.		C2	
	Discuss the physiological basis of suppression of the female ovarian cycles in nursing mothers for many months after delivery.		C2	
PRACTICAL				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Pregnancy Test	Perform Pregnancy test	Lab	C2 /P2	OSCE

BIOCHEMISTRY				
ENDOCRINOLOGY LOs				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Introduction to Endocrinology	Define different chemical messengers.	LGIS / SGD	C2	MCQs, SEQs, OSVE
	Enlist endocrine organs and hormones of the body.		C2	
	Enlist the hormones on the basis of chemical nature.		C2	
	Discuss the feedback control of hormone secretion.		C2	
	Explain the up and down regulation of receptors.		C2	
	Enlist the location of hormone receptors.		C2	
	Explain the mechanism of intracellular signaling after hormone receptor activation.		C2	
	Explain the mechanism of hormones that receptors present in cytoplasm and nucleus (act on genetic machinery).		C2	
	Enlist second messenger mechanisms for mediating intracellular hormonal functions.		C2	
	Enumerate the hormones that use the adenylyl cyclase– cAMP Second		C2	

	Messenger System.			
	Explain the cell membrane phospholipid second messenger System.		C2	
	Explain the mechanism of calcium Calmodulin system.		C2	
Signal Transduction	Describe the features of Signal transduction.	LGIS / SGD	C2	MCQs, SEQs, OSVE
	Describe different types of receptors.		C2	
Classification	Discuss the classification of hormones	LGIS		
Second Messengers	Describe different types of second messengers.		C2	
	Differentiate the G protein and non-G protein mediated pathways of signal transduction.		C2	
	Discuss the hormones which act through: Cyclic AMP (Adenosine monophosphate).		C2	
	Discuss the hormones which act through: Cyclic GMP (guanosine monophosphate).	LGIS	C2	
	Discuss the hormones which act through calcium phosphoinositol.		C2	
	Describe the receptor tyrosine kinase pathway of signal transduction.		C2	
	Explain the Serine threonine kinase pathway of signal transduction.		C2	
	Discuss the Nuclear Receptor mediated pathway of signal transduction.	LGIS	C2	
	Describe the Receptor coupled to JAK STAT pathway of signal transduction.		C2	
	Explain the control and negative feedback mechanism of hormone regulation.		C2	
Biochemistry of Hormones	Discuss the biosynthesis, secretion, mechanism of action and metabolic functions of Insulin, glucagon, epinephrine, cortisol, thyroid and growth hormone with special reference to carbohydrate, protein and lipid metabolism.	LGIS / SGD	C2	MCQs, SEQs, OSVE
	Interpret disorders of hormones on the basis of sign, symptoms and given data.			
	Explain the synthesis, secretion, transport and clearance of steroid and protein hormones.			
Synthesis of Adrenocortico-tropic Hormones	Explain the synthesis and secretion of ACTH (Adrenocorticotropic hormone) in association with melanocyte-stimulating hormone, lipotropin, and endorphin.	LGIS	C2	MCQs, SEQs, OSVE
	Enlist the steps in the synthesis of adrenocortical hormone.		C2	

REPRODUCTION LOs				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Synthesis of Testosterone, Progesterone and Estrogen	Explain the structure, biosynthesis, secretion, transport, regulation, and catabolism, mechanism of action and biochemical role of testosterone, progesterone and estrogen.	LGIS / SGD	C2	MCQs, SEQs, OSVE
Steroid in Infertility	Discuss the role of steroid hormones in oral contraception& iInfertility.	LGIS	C2	MCQs, SEQs, OSVE
Nomenclature of Genetics	Define the following terms: chromosome, allele (dominant and recessive), gene, locus, heterozygote, homozygote, hemizygous, autosome, genotype, phenotype, haploid and diploid number of chromosomes, aneuploidy, proband, proposita, pedigree, propositus, penetrance, codominance and polygenic.	LGIS	C2	MCQs, SEQs, OSVE
Genes	Discuss the structures of genes, how they are organized and regulated.	LGIS	C2	
Mendelian Laws	Describe Mendelian Law of Segregation and Law of Independent Assortment.	LGIS	C2	MCQs, SEQs, OSVE
Patterns of Inheritance	Describe the patterns of inheritance characteristic of autosomal dominant, autosomal recessive, X- linked	LGIS/ SGD	C2	
Pedigrees	Interpret genetic symbols as they appear in pedigrees.		C2	
Inheritance	Analyze pedigree to determine the mode of inheritance of following traits: 1. X-linked recessive (Duchenne Muscular dystrophy) 2. X-linked dominant (Rickets) 3. Autosomal recessive (Xeroderma Pigmentosum) 4. Autosomal dominant (Huntington's Disease) 5. Mitochondrial disorder (Mitochondrial diabetes)	LGIS / SGD	C3	MCQs, SEQs, OSVE
Central Dogma (Overview)	Discuss the concept of central dogma from gene to protein (replication, transcription and translation).	LGIS	C2	MCQs, SEQs, OSVE
Gene Expression	Discuss the gene expression especially Lac operon and Tryptophan operon.	LGIS/ SGD	C2	MCQs, SEQs, OSVE
	Discuss the regulation of eukaryotic gene expression with special emphasis on iron metabolism and RNA interference		C2	

Techniques	Discuss the following Recombinant DNA techniques with reference to their principles, procedures and application: • PCR (Polymerase Chain Reaction) • RFLP (Restriction Fragment Length Polymorphism) • Cloning • Human Genome Project • Blotting Techniques • DNA (Deoxyribonucleic Acid) sequencing	LGIS	C2	MCQs, SEQs, OSVE

PRACTICAL BIOCHEMISTRY				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
DNA	Perform DNA extraction	Practical Lab	C2 / P	OSPE
Electrophoresis	Perform Electrophoresis		C2 / P	
PCR	Perform PCR		C2 / P	
ELISA	Demonstrate ELISA (enzyme-linked immunoassay) to measure the concentration of hormones		C2 / P	

Community Medicine				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Diabetes	Define Diabetes Mellitus according to WHO (World Health Organization) criteria.	LGIS	C1	MCQs
	Classify types of diabetes mellitus.		C2	
	Describe epidemiological risk factors, distribution & statistics, screening of community for diabetes.		C2	
	Apply levels of prevention for control of diabetes.		C2	
Genetics	Classify types of genetic disorders common in community.	LGIS	C2	
	Describe health promotional measures to control genetic diseases.		C2	
	Describe screening programs for community to prevent genetic disorders.		C2	
	Apply levels of preventive and social measures for control of genetic abnormalities.		C2	
Reproductive Health	Define women health and life cycle approach for health related events.	LGIS	C1	MCQs
	Highlight statistics related to human reproductive health issues.		C2	
	Enumerate health related problems across a woman's reproductive		C1	

	lifetime.			
	Explain the components of reproductive health.		C2	

BEHAVIORAL SCIENCE				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Sexual difficulties and Medical Practices	Discuss common sexual dysfunctions and their prevalence, with emphasis on culture bound syndromes.	LGIS	C2	MCQs
	Identify the various biological, psychological, and relational factors that can contribute to sexual difficulties.		C2	
	Discuss the importance of person centered and nonjudgmental approach when discussing sexual health concerns.		C2	
	Explain the ethical obligations of healthcare professionals in respecting patient confidentiality and informed consent when addressing sexual health issues.		C2	
	Enlist the behavioral factors associated with pharmacological treatment of diseases		C1	

PHARMACOLOGY				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Thyroid Drugs	Explain the mechanism of action of thyroxine.	LGIS	C2	MCQs
	Explain Clinical uses and potential adverse effects with use of thyroxine.		C2	

PATHOLOGY				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Pituitary Pathology	Enumerate clinical manifestations along with hormone levels of anterior pituitary gland.	LGIS	C2	MCQs
	Classify pituitary adenomas.		C2	
	Enumerate posterior pituitary syndromes (inappropriate ADH secretion, diabetes insipidus).		C1	
	Describe posterior pituitary syndromes (inappropriate ADH secretion, diabetes insipidus).		C2	
Thyroid & Parathyroid Pathology	Enumerate causes of hypo and hyperthyroidism along with levels of thyroid hormones.	LGIS	C1	MCQs
	Enumerate causes of hypercalcemia, hyper and hypoparathyroidism.		C1	
Diabetes Mellitus	Classify Diabetes Mellitus according to etiology.	LGIS	C2	MCQs
	Discuss differentiating features of DM-I and DM-II on the basis of pathogenesis, clinical features, diagnosis and complications		C2	
Adrenal Pathology	Enumerate causes of Cushing syndrome with lab investigations.	LGIS	C1	MCQs
	Discuss causes and clinical features of adrenocortical insufficiency (Addison disease).		C2	
Female Reproductive Tract Pathology	Enumerate causes of lower genital tract infections and PIDs along with lab investigations.	LGIS	C1	MCQs
	Enumerate causes of infertility in females along with hormonal investigations.		C1	
	Enumerate causes of dysfunctional uterine bleeding with histopathological features.		C1	
	Discuss pathophysiology and lab diagnosis of eclampsia and preeclampsia.		C2	
	Enlist causes of placental implantations (ectopic pregnancy)		C1	
Male Reproductive Tract Pathology	Enumerate causes of inflammation of male genital tract.	LGIS	C1	MCQs
	Enlist causes of male infertility with semen analysis		C1	
	Describe pathological features of testicular torsion.		C2	

CLINICAL SKILLS (CSIM)				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Thyroid Gland	Demonstrate steps of examination of the thyroid gland.	Skill Lab	C2 / P	OSCE
Acromegaly	Demonstrate examination for acromegaly.		C2 / P	
Blood Sugar Measurement	Record the blood sugar by using glucometer.		C2 / P	
Suturing	Observe different suturing techniques.		C2 / P	

PERLS (PROFESSIONALISM, ETHICS, RESEARCH, LEADERSHIP SKILLS)				
Topic	**Specific Learning Objectives**	**Teaching strategy**	**Levels C/P/A**	**Assessment**
Accountability	Write an anonymous report on a cheating incident in class during last year.	LGIS	C3	OSCE
	Demonstrate engagement in co-curricular and extracurricular activities.		C4	
Communication	Write a dialogue between a senior doctor and a patient.	LGIS	C2	OSCE
Empathy	Demonstrate respect of diversity in children with disabilities.	LGIS	C2	OSCE
Ethics	Obtain Informed consent from a stable patient.	LGIS	C2	OSCE

Time Tables:

The timetables for the module will be shared via WhatsApp groups and the notice boards in advance.

Assessment Tools

Theoretical knowledge is tested by a written examination system constituted by multiple choice questions (MCQ) and SEQs. The assessment of practical knowledge involves oral, spot, or objective structured practical examinations (OSPE).

Multiple Choice Questions (MCQ/SEQs):

Multiple choice questions (MCQ/SEQs) are a form of assessment for which students are asked to select the best choice from a list of answers.
MCQ/SEQ consists of a stem and a set of options. The stem is usually the first part of the assessment that presents the question as a problem to be solved; the question can be an incomplete statement which requires to be completed and can include a graph, a picture or any other relevant information. The options are the possible answers that the student can choose from, with the correct answer called the key and the incorrect answers called distractors.
Correct answer carries one mark, and incorrect 'zero mark'. There is NO negative marking.

Students mark their responses on specified computer-based sheet designed for the college.
The block exam will comprise of 85 MCQ/ 7 SEQs each of 5 marks and will be compiled according to the shared blueprint.

Short Essay Questions (SEQ)

Short Essay questions generally ask for brief, text-based responses. They can be used to assess students' understanding of and ability to think with subject matter content, discourage guessing of answers, in-depth knowledge of concepts, and formulation of an answer.

Objective Structured Practical or Clinical Examination (OSCE / OSPE)

- The content may assess application of knowledge, or practical skills.
- Student will complete task in define time at one given station.
- All the students are assessed on the same content by the same examiner in the same allocated time.
- A structured examination will have observed, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Rest station is a station where there is no task given, and in this time student can organize his/her thoughts.
- The Block OSPE / OSCE will be comprise of 12 examined stations. The stations will be assigned according to the shared blueprint.

Internal Evaluation:

Internal evaluation is a process of quality review undertaken within an institution for its own ends. Internal evaluation criteria will be shared with faculty and 20 % on internal assessment will be observed in each module.

Attendance Requirement:

A minimum of 85% attendance is mandatory to sit for the examinations.

Professional Examination:

Criteria for appearing in Professional examination are according to rules and regulations shared by UHS which are available on their website. The criteria is;

- At least 85 % cumulative attendance in all blocks.
- An average 50 % minimum score in all blocks
- Certificate of good conduct from college
- Certificate of having appeared in all block exams conducted by the college

Learning Resources for Students

Anatomy

- Snell Clinical Anatomy 10th ed
- B.D Churasia
- Nelter Atlas
- Langman Embryology (12th Edi)
- Laiq Hassain Basic Histology (8th Ed)
- Difore Atlas Histology

Physiology

- Guyton and Hall physiology (14th Ed)
- Essentials of Medical Physiology by Mushtaq Ahmed

Biochemistry

- Harpers Illustrated Biochemistry (32nd Ed)
- Lippincott's Biochemistry
- Essentials of Medical Biochemistry vol 1&2 by Mushtaq Ahmed.

Community Medicine:

- Parks Textbook of Preventive and Social Medicine. K. Park (Editor)

Pathology:

- Vinary Kumar, Abdul K. Abbas and Nelson Fausto Robbins and Cotran, Pathologic basis of disease. WB Saunders.

Pharmacology:

- Basic and Clinical Pharmacology by Katzung, McGraw-Hill.

Behavioral Sciences:

- Handbook of Behavioral Sciences by Prof. Mowaddat H.Rana, 3rd Edition

Apart from these resource learning, students can consult books available in library or recommended by the specialty experts.