



# RESPIRATORY STUDY GUIDE SECOND YEAR

This Study guide of the module/course outlines the key components and areas for the facilitation of the students.

**Department of Medical Education**

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## Vision and Mission of KGMC

### Khyber Medical University: Vision



Khyber Medical University will be the global leader in health sciences academics and research for efficient and compassionate health care.

### Khyber Girls Medical College: Vision



Khyber Girls Medical College will promote health care leaders that are critical thinker, ethical, research oriented, culturally and professionally competent

### Khyber Girls Medical College: Mission



To develop competent health care leaders by ensuring appropriate policies, procedures which reflect ethical, cultural, community orientated and evidence based practices to achieve best possible health outcomes for society at large.

## Curriculum Committee KGMC

### Chair:

Professor Dr.Zahid Aman , Dean KGMC.

### Co-Chair:

Dr. Sabina Aziz, Associate Dean KGMC.

### Clinical Sciences:

- Dr. Mohammad Noor Wazir ,Department of Medicine KGMC/HMC
- Dr. Bushra Rauf Department of Gynae KGMC/HMC.
- Dr. Sofia Iqbal, Department of Ophthalmology KGMC/HMC.
- Dr. Said Amin Department of Medicine KGMC/HMC.
- Dr. Ghareeb Nawaz Department of ENT KGMC/HMC.
- Dr. Jamshed Alam Department of Surgery KGMC/HMC.
- Dr. Ambreen Ahmad, Department of Pediatrics KGMC/HMC.
- Dr. Ain-ul-Hadi Department of Surgery KGMC/HMC.
- Dr. Fawad Rahim Department of Medicine KGMC/HMC.

### Behavioral Sciences:

- Dr. Ameer Abbas Department of Psychiatry KGMC/HMC.

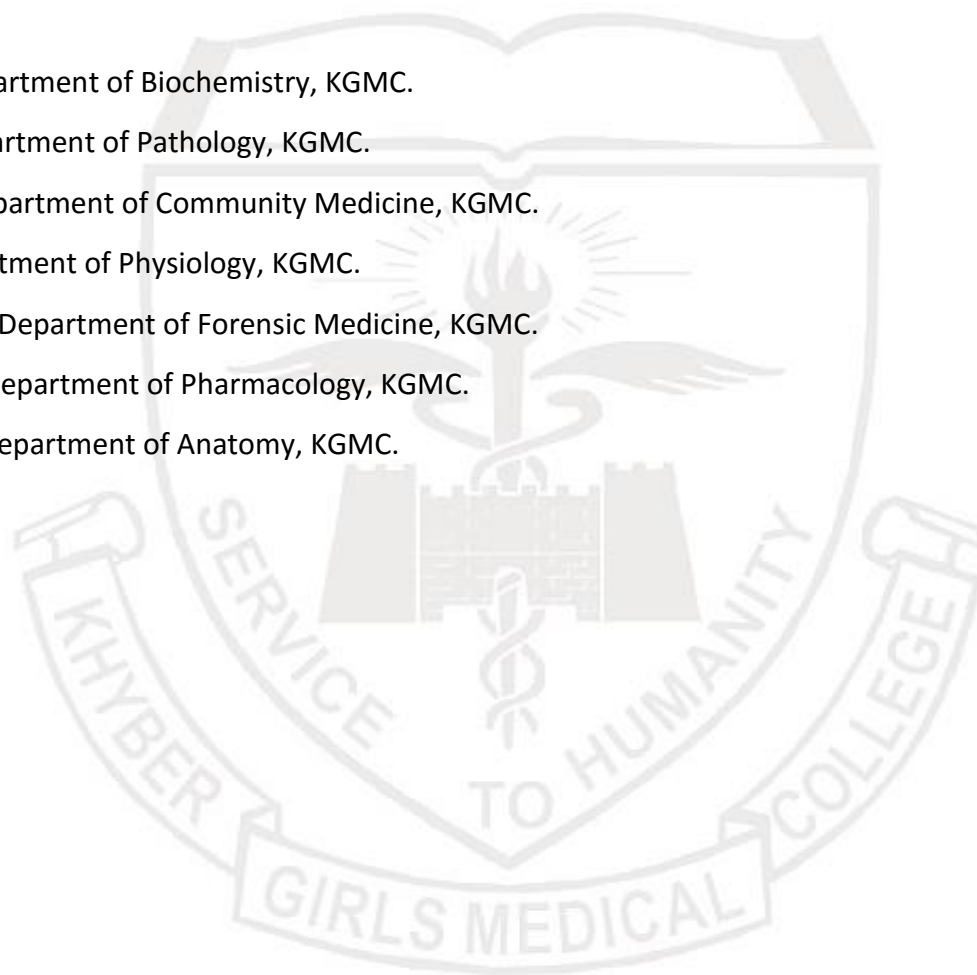
### Medical Education

- Dr. Naheed Mahsood, Department of Medical Education, KGMC.

- Dr. Naveed Afzal Khan, Department of Medical Education, KGMC.
- Dr. Onaiza Nasim , Department of Medical Education, KGMC

**Basic Sciences:**

- Dr. Amin-ul-Haq Department of Biochemistry, KGMC.
- Dr. Khalid Javed Department of Pathology, KGMC.
- Dr. Raheela Amin Department of Community Medicine, KGMC.
- Dr. Zubia Shah Department of Physiology, KGMC.
- Dr. Naheed Siddique Department of Forensic Medicine, KGMC.
- Dr. Shams Suleman Department of Pharmacology, KGMC.
- Dr. Shahab-ud-Din, Department of Anatomy, KGMC.



## Module Committee for Respiratory

1. Dr Nabila Sher Assitant Professor **Biochemistry** .....Module coordinator:
2. Dr. Naheed Mahsood Assistant Professor **DME**.....Module Secretary
3. Dr. Naveed Afzal Khan Coordinator **DME**..... Module Secretary:
4. Dr Onaiza Nasim co ordinator **DME** .....Member
5. Dr. Raheela Amin professor **Community Medicine**.... Member:
6. Dr. Shams Suleman, Associate Professor **Pharmacology**..... Member:
7. Dr. Nahecd Sidique Assistant Professor **Forensic Medicine** .....Member
8. Dr. Kalsoom Tariq Assistant Professor **Biochemistry**.....Member:
9. Dr. Munir Hussain Assistant Professor **Pathology** .....Member:
10. Dr. Ameer Abbass Assistant Professor **psychiatry** .....Member:
11. Dr. Mussarrat Hussain Assistant Professor **Surgical B** ....Member
12. Dr. Raza Assistant Professor **Pulmonology**.....Member
13. Dr. Shabnam Gul Senior Lecturer **Admin**.....Member:
14. Dr. Ibrar Wazir, Lecturer **Anatomy**.....Member
15. Dr. Sarah Shahid Lecturer **Physiology**.....Member

## 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.

## Outcomes of the curriculum:

The outcomes of the curriculum of MBBS According to the PMDC are as follows

- Knowledgeable
- Skilful
- Community Health Promoter
- Problem-solver
- Professional
- Researcher
- Leader and Role Model

## **KNOWLEDGE**

By the end of five year MBBS program the KGMC student should be able to;

1. Acquire a high level of clinical proficiency in history taking, physical examination, differential diagnosis, and the effective use of medicine's evolving diagnostic and procedural capabilities including therapeutic and palliative modalities
2. Manage the common prevalent diseases in community
3. Identify the common medical emergencies
4. Develop plan for prevention of common community diseases
5. Formulate a referral plan
6. Compose a prescription plan

## **PSYCHOMOTOR**

By the end of five year MBBS program the KGMC student should be able to;

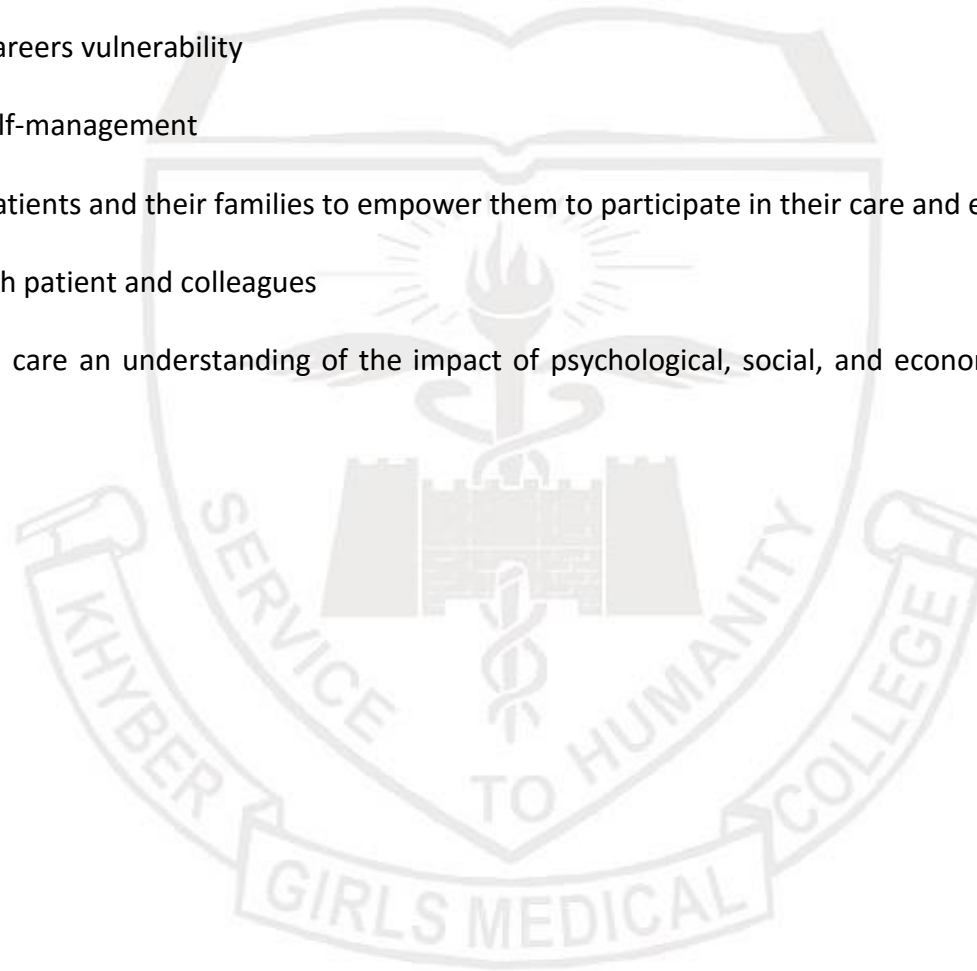
1. Demonstrate the ability to perform the disease specific relevant examination
2. Respond to common medical emergencies
3. Master the skill of first aid
4. Perform BLS
5. Apply the best evidenced practices for local health problems



## **AFFECTIVE**

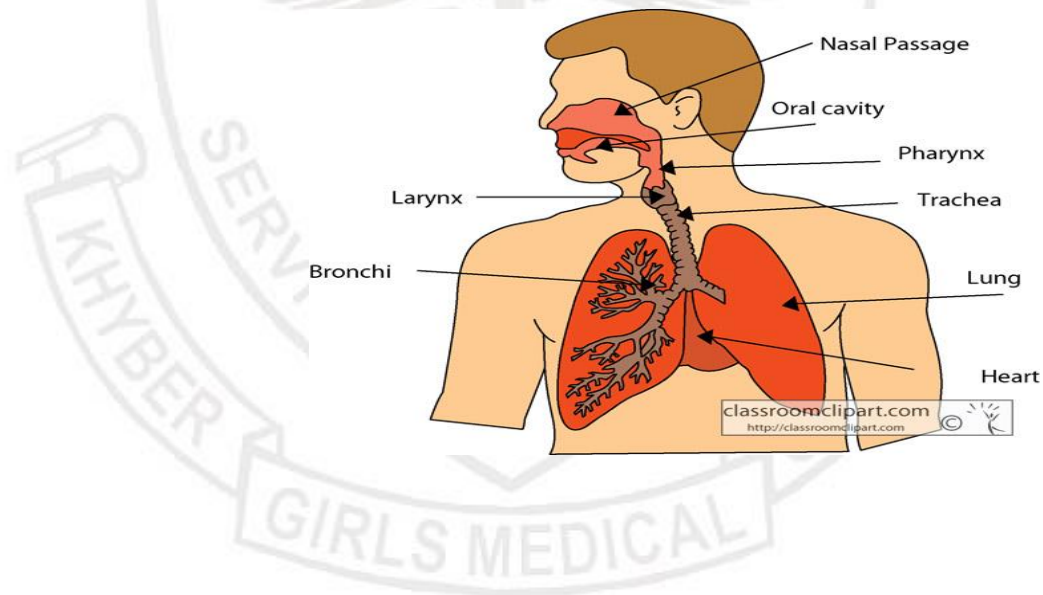
By the end of five year MBBS program the KGMC student should be able to

1. Relate to patient and caregivers vulnerability
2. Demonstrate ethical self-management
3. Counsel and educate patients and their families to empower them to participate in their care and enable shared decision-making.
4. Display compassion with patient and colleagues
5. Demonstrate in clinical care an understanding of the impact of psychological, social, and economic factors on human health and disease



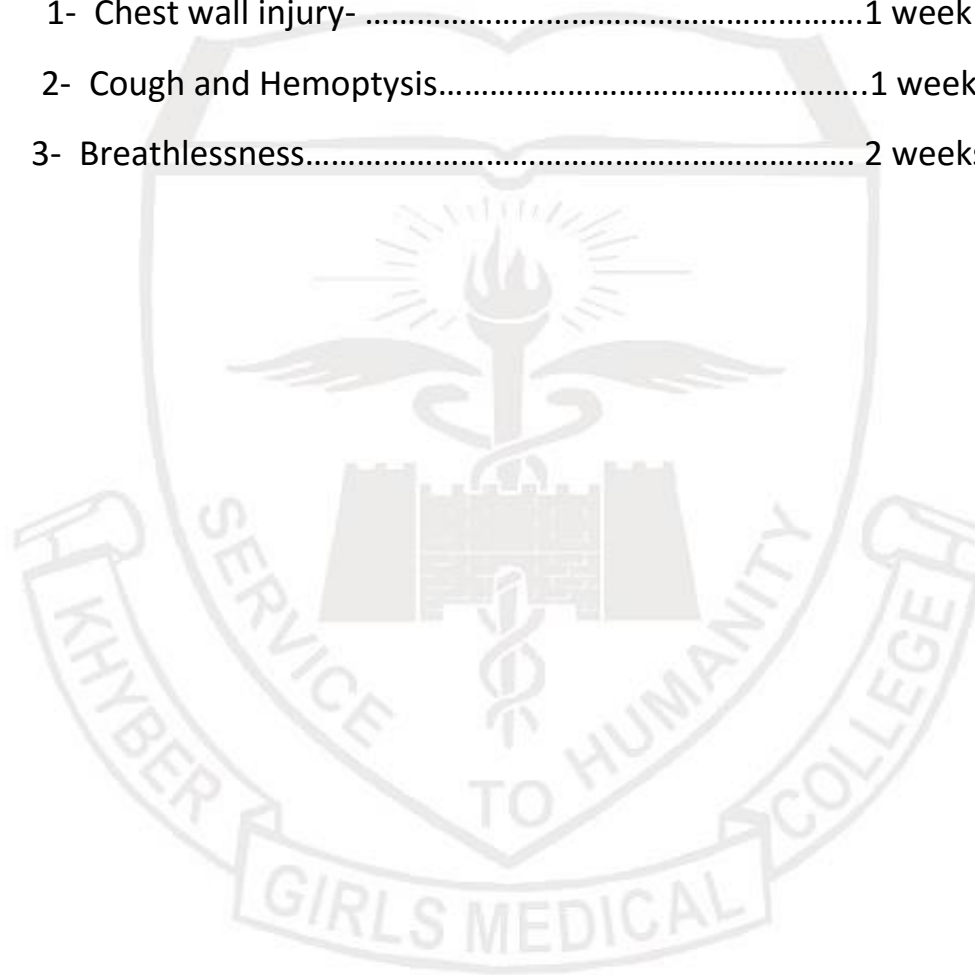
## Introduction to the Respiratory system

The respiratory system consists of all the organs involved in breathing. These include the nose, pharynx, larynx, trachea, bronchi and lungs. The respiratory system does two very important things: it brings oxygen into our bodies, which we need for our cells to live and function properly; and it helps us get rid of carbon dioxide, which is a waste product of cellular function..



## Themes

- 1- Chest wall injury- .....1 week
- 2- Cough and Hemoptysis.....1 week
- 3- Breathlessness..... 2 weeks



## Themes of the module

4- Chest wall injury- 1 week

5- Cough and Hemoptysis-1 week

6- Breathlessness- 2 weeks

### GENERAL LEARNING OUTCOMES

By the end of this module the students will be able to;

- 1- Describe the anatomy and abnormalities of thoracic cage
- 2- Describe the development and gross anatomy of the diaphragm
- 3- Describe the contents of mediastinum and their relations
- 4- Describe the anatomy of pleura and its reflections
- 5- Describe the gross and microscopic structure, development, nerve supply and blood supply of trachea, bronchi and lungs
- 6- Describe the epithelia and connective tissues lining the respiratory passageways.
- 7- Describe pulmonary ventilation
- 8- Discuss the mechanisms of gaseous exchange between alveoli, and blood and blood and tissues

- 9- Elaborate the transport of gases in the blood
- 10- Describe the mechanisms of regulation of respiration
- 11- Define hypoxia, and cyanosis
- 12- Describe the effect of aging on respiratory system
- 13- Describe glycolysis
- 14- Describe the processes of kreb`s cycle
- 15- Describe the mechanisms of biologic oxidation
- 16- Describe the mechanisms of energy production in the body
- 17- Describe the mechanisms of O<sub>2</sub> and CO<sub>2</sub> transport in the blood
- 18- Classify anti-asthmatic and anti-tuberculous drugs
- 19- Describe the types and signs of asphyxia
- 20- Enlist the causes and signs of pneumonias, bronchial asthma, tuberculosis, Acute Respiratory Distress Syndrome (ARDS), and pulmonary edema
- 21- Describe the parameters of Pulmonary Function Tests (PFTs)

## **Skill**

Draw a normal spirogram, labeling the four lung volumes and four capacities.

Examine the chest

Do the spirometry and plot the graph

Demonstrate ABGS and compare the results

Demonstrate the use of inhaler to the subject

Calculate the respiratory rate of the subject

## **Attitude**

1. Demonstrate ability to give and receive feedback, respect for self and peers.
2. Develop respect for the individuality and values of others - (including having respect for oneself) patients, colleagues and other health professionals
3. Organize & distribute tasks
4. Exchange opinion & knowledge
5. Develop communication skills and etiquette with sense of responsibility.
6. To equip themselves for teamwork
7. Regularly attend the classes

Specific learning objectives (theme based)

Theme-1: Chest wall injuries					
Subject	Topic	S. No	Learning objectives	Teaching strategy	Assessment
Anatomy	Gross anatomy of thorax	1	Describe main features of thoracic wall	Dissection/demo	MCQ/SEQ
		2	Describe the location and shape of the sternum	Dissection/demo	MCQ/SEQ
		3	Describe the parts of the sternum	Dissection/demo	MCQ/SEQ
		4	Describe the articulations and muscle attachments	Dissection/demo	MCQ/SEQ
		5	Describe the gross features of the thoracic vertebrae a. Vertebral body b. Intervertebral disc c. Laminae d. Pedicles e. Intervertebral foramina f. Processes	Dissection/demo	MCQ/SEQ

			g. Ligaments		
		6	Differentiate between typical and atypical ribs.	Dissection/demo	MCQ/SEQ
		7	Describe different joints of thorax	Dissection/demo	MCQ/SEQ
		8	Discuss Intercostal muscles	Dissection/demo	MCQ/SEQ
		9	Discuss the contents of intercostal spaces	Dissection/demo	MCQ/SEQ
		10	Describe the origin of intercostal arteries	Dissection/demo	MCQ/SEQ
		11	Describe the origin, course and distribution of intercostal nerves	Dissection/demo	MCQ/SEQ
		12	Discuss branches and course of internal thoracic artery	Dissection/demo	MCQ/SEQ
	Abnormalities of thoracic wall	13	Describe thoracic wall abnormalities and its clinical correlation	Dissection/demo	MCQ/SEQ
	Diaphragm	14	Describe the origin and insertion of the diaphragm	Dissection/demo	MCQ/SEQ
		15	Describe the openings of the diaphragm	Dissection/demo	MCQ/SEQ



		16	Describe the nerve supply of diaphragm and its clinical significance	Dissection/demo	MCQ/SEQ
	Mediastinum	17	Describe the contents of the superior mediastinum	Dissection/demo	MCQ/SEQ
		18	Describe the contents of the Anterior & Posterior Mediastinum	Dissection/demo	MCQ/SEQ
		19	Describe the relations of different contents in mediastinum	Dissection/demo	MCQ/SEQ
		20	Identify various anatomical landmarks on chest X-Rays, CT and MRI	Dissection/demo	MCQ/SEQ
Embryology	Development of Diaphragm	21	Describe development of diaphragm	LGF	MCQ/SEQ
		22	Describe diaphragmatic hernias and clinical significance	LGF	MCQ/SEQ
	Development of Ribs	23	Describe the development of ribs from costal elements of primitive vertebrae	LGF	MCQ/SEQ

Physiology	Mechanics of Respiration	24	Describe the mechanics of respiration	LGF	MCQ/SEQ
		25	Describe the pressures that cause the movements of the air in and out of the lungs	LGF	MCQ/SEQ
	Lung compliance	26	Define compliance of the lung and elastic recoil	LGF	MCQ/SEQ
		27	Identify two common clinical conditions in which lung compliance is higher or lower than normal.	LGF	MCQ/SEQ
	Lung volumes and capacities	28	Describe changes in the lung volume, alveolar pressure, pleural pressure, and trans-pulmonary pressure during normal breathing	LGF	MCQ/SEQ
		29	Draw a normal pulmonary pressure-volume (compliance) curve (starting from residual volume to total lung capacity and back to residual volume), labeling the inflation and	LGF	MCQ/SEQ

			deflation limbs. Explain the cause and significance of the hysteresis in the curves.		
		30	Draw the pressure-volume (compliance) curves for the lungs, chest wall, and respiratory system on the same set of axes. Show and explain the significance of the resting positions for each of these three structures.	LGF	MCQ/SEQ
Surgery		31	Describe pneumothorax	LGF	MCQ/SEQ
		32	Define Hydropneumothorax	LGF	MCQ/SEQ
<b>Theme-2: Cough and Hemoptysis</b>					
Anatomy	Introduction	33	Describe the major components of the (upper and lower) respiratory system and describe their functions	Dissection/demo	MCQ/SEQ
	Trachea, bronchi and lungs	34	Describe trachea and bronchi with relations plus subdivisions	Dissection/demo	MCQ/SEQ
		35	Describe the neurovascular supply of	Dissection/demo	MCQ/SEQ

			trachea and bronchi		
		36	Describe the surfaces anatomy of trachea and bronchi	Dissection/demo	MCQ/SEQ
		37	Describe the lungs with their lobes and fissures, relations with surroundings and surfaces and compare between right and left lungs.	Dissection/demo	MCQ/SEQ
		38	Describe Broncho-pulmonary segments and their clinical importance	Dissection/demo	MCQ/SEQ
		39	Describe innervations, blood supply and lymphatic drainage of the lungs.	Dissection/demo	MCQ/SEQ
Embryology	Development of Respiratory system	40	Describe development of trachea, bronchial tree, pleura, lungs	Dissection/demo	MCQ/SEQ
		41	Recognize the cephalo-caudal and transverse folding of embryonic disc	Dissection/demo	MCQ/SEQ
		42	Describe the extent of intra embryonic coelom after folding and its divisions into three serous cavities	Dissection/demo	MCQ/SEQ

		43	State the derivatives of visceral and parietal layers of mesoderm	Dissection/demo	MCQ/SEQ
		44	State the pericardio-peritoneal canals and their final fate	Dissection/demo	MCQ/SEQ
		45	Discuss the formation of Lung Bud	Dissection/demo	MCQ/SEQ
Histology	Respiratory epithelium and connective tissues	46	Classify the types of epithelia lining the various parts of respiratory system	Dissection/demo	MCQ/SEQ
		47	Differentiate between the histological differences among various parts of respiratory system	Dissection/demo	MCQ/SEQ
		48	Describe the structure of trachea and its layer		
		49	discuss the microscopic picture of respiratory bronchiole, alveolar ducts, alveolar sacs and alveoli.	Dissection/demo	MCQ/SEQ
		50	Describe the different types of cells found in alveoli	Dissection/demo	MCQ/SEQ

Physiology	Functions of respiratory passageways	51	Describe the respiratory and non-respiratory functions of the respiratory passageways	LGF	MCQ/SEQ
		52	Identify the mechanism by which particles are cleared from the airways.	LGF	MCQ/SEQ
Pharmacology	Anti-Aashtmatic drugs	53	Enlist Anti-asthmatic drugs	LGF	MCQ/SEQ
	Anti-Tuberculous drugs	54	Classify Anti-tuberculous drugs	LGF	MCQ/SEQ
Pathology	Pneumonias	55	Define pneumonia and enlist the causative pathogens of pneumonia	LGF	MCQ/SEQ
	Pulmonary Tuberculosis	56	Define primary and secondary Tuberculosis and state its etiology	LGF	MCQ/SEQ
	Bronchial Asthma	57	Describe the etiology, pathogenesis and clinical features of asthma	LGF	MCQ/SEQ
	Pulmonary Edema	58	Define pulmonary edema and classify it according to underlying causes	LGF	MCQ/SEQ
Community	Prevention of	59	Discuss preventive strategies of	LGF	MCQ/SEQ

Medicine	Respiratory disorders		different problems related to respiratory system		
		60	Discuss the relationship of smoking with lung Diseases	LGF	MCQ/SEQ
		61	Describe preventive strategies for smoking	LGF	MCQ/SEQ
<b>Theme-3: Breathlessness</b>					
Anatomy	Mechanics of respiration	62	Describe briefly mechanics of respiration	Dissection/demo	MCQ/SEQ
	Pleura	63	Describe the gross features of pleura	Dissection/demo	MCQ/SEQ
		64	Describe the pleural cavity and the pleural reflections	Dissection/demo	MCQ/SEQ
		65	Describe the surface anatomy related to pleural reflections	Dissection/demo	MCQ/SEQ
Embryology		66	Describe the development of pleural cavity	LGF	MCQ/SEQ
Histology		67	Discuss surfactant, alveolar septum, alveolar pores and alveolar macrophages	LGF	MCQ/SEQ

Physiology	Pulmonary ventilation	68	Define respiration	LGF	MCQ/SEQ
		69	Compare between the internal and external respiration	LGF	MCQ/SEQ
		70	Enlist the steps of external respiration accomplished by the respiratory system and those carried out by the circulatory system	LGF	MCQ/SEQ
		71	State the functions of Type I alveolar cells, Type II alveolar cells, and alveolar macrophages	LGF	MCQ/SEQ
		72	Describe the forces that keep the alveoli open and those that promote alveolar collapse.	LGF	MCQ/SEQ
		73	Define the following terms: anatomic dead space, physiologic dead space, wasted (dead space) ventilation, total minute ventilation and alveolar minute ventilation.	LGF	MCQ/SEQ



		74	Compare anatomic and physiologic dead space	LGF	MCQ/SEQ
		75	Describe the basic concept of measurement of dead space	LGF	MCQ/SEQ
		76	Enlist the factors that changes the dead space	LGF	MCQ/SEQ
		77	Define the following terms: hypoventilation, hyperventilation, hypercapnea, eupnea, hypopnea, and hyperpnea.	LGF	MCQ/SEQ
		78	Define surface tension, surfactants, atelectasis	LGF	MCQ/SEQ
		79	Describe the role of surfactants on the lung compliance.	LGF	MCQ/SEQ
		80	Describe the composition of the pulmonary surfactants and its role	LGF	MCQ/SEQ
		81	Describe the pathophysiology of respiratory distress syndrome of the newborn	LGF	MCQ/SEQ

		82	Discuss the work of breathing	LGF	MCQ/SEQ
	Pulmonary circulation	83	Explain the physiologic anatomy of the pulmonary circulatory system	LGF	MCQ/SEQ
		84	Describe the pressures in the pulmonary circulatory system	LGF	MCQ/SEQ
		85	Describe blood volume of the lungs	LGF	MCQ/SEQ
		86	Describe blood flow through the lungs and its distribution	LGF	MCQ/SEQ
		87	Compare the systemic and pulmonary circulations with respect to pressures, resistance to blood flow, and response to hypoxia.	LGF	MCQ/SEQ
		88	Describe the regional differences in pulmonary blood flow in an erect position.	LGF	MCQ/SEQ
		89	Describe the consequence of hypoxic pulmonary vasoconstriction on the distribution of pulmonary blood flow.	LGF	MCQ/SEQ
		90	Describe the pulmonary capillary	LGF	MCQ/SEQ

			dynamics		
		91	Describe the development of pulmonary edema	LGF	MCQ/SEQ
	Gas exchange	92	List the normal airway, alveolar, arterial, and mixed venous PO <sub>2</sub> and PCO <sub>2</sub> values.	LGF	MCQ/SEQ
		93	List the normal arterial and mixed venous values for O <sub>2</sub> saturation, [HCO <sub>3</sub> <sup>-</sup> ]	LGF	MCQ/SEQ
		94	List the factors that affect diffusive transport of a gas between alveolar gas and pulmonary capillary blood.	LGF	MCQ/SEQ
		95	Describe respiratory unit	LGF	MCQ/SEQ
		96	Describe the physiologic anatomy of the respiratory membrane and its significance	LGF	MCQ/SEQ
		97	Describe the factors that affect the rate of gaseous diffusion through the respiratory membrane	LGF	MCQ/SEQ

		98	Describe the diffusing capacity of respiratory membrane for O <sub>2</sub> and CO <sub>2</sub> at rest and exercise.	LGF	MCQ/SEQ
		99	Describe the effect of ventilation/perfusion (V/Q) ratio on alveolar gas concentrations.	LGF	MCQ/SEQ
		100	Identify the average V/Q ratio in a normal lung.	LGF	MCQ/SEQ
		101	Explain the concept of physiologic shunt and physiologic dead space	LGF	MCQ/SEQ
		102	Describe the abnormalities of ventilation perfusion ratio in normal lung and chronic obstructive lung disease.	LGF	MCQ/SEQ
		103	Enlist common causes of hypoxemia	LGF	MCQ/SEQ
	Transport of O <sub>2</sub> and CO <sub>2</sub> in the blood	104	Define oxygen partial pressure (tension), oxygen content, and percent hemoglobin saturation as they pertain to blood.	LGF	MCQ/SEQ

		105	Describe Oxyhemoglobin dissociation curve (hemoglobin oxygen equilibrium curve) showing the relationships between oxygen partial pressure, hemoglobin saturation, and blood oxygen content.	LGF	MCQ/SEQ
		106	Describe the relative amounts of O <sub>2</sub> carried bound to hemoglobin with that carried in the dissolved form.	LGF	MCQ/SEQ
		107	State Henry's Law (the relationship between PO <sub>2</sub> and dissolved plasma O <sub>2</sub> content)	LGF	MCQ/SEQ
		108	Describe how the shape of the oxyhemoglobin dissociation curve influences the uptake and delivery of oxygen.	LGF	MCQ/SEQ
		109	Define P <sub>50</sub> .	LGF	MCQ/SEQ
		110	Describe how the oxyhemoglobin dissociation curve is affected by	LGF	MCQ/SEQ

			changes in blood temperature, pH, PCO <sub>2</sub> , and 2,3-DPG.		
		111	Describe how anemia and carbon monoxide poisoning affect the shape of the oxyhemoglobin dissociation curve, PaO <sub>2</sub> , and SaO <sub>2</sub> .	LGF	MCQ/SEQ
		112	List the forms in which carbon dioxide is carried in the blood.	LGF	MCQ/SEQ
		113	Describe the percentage of total CO <sub>2</sub> transported as each form.	LGF	MCQ/SEQ
		114	Describe the chloride shift and its importance in the transport of CO <sub>2</sub> by the blood.	LGF	MCQ/SEQ
		115	Describe the enzyme that is essential to normal carbon dioxide transport by the blood and its location.	LGF	MCQ/SEQ
		116	Describe the carbon dioxide dissociation curves for oxy- and deoxyhemoglobin.	LGF	MCQ/SEQ

		117	Describe the interplay between CO <sub>2</sub> and O <sub>2</sub> binding on hemoglobin that causes the Haldane effect.	LGF	MCQ/SEQ
	Regulation of Respiration	118	Describe the regions in the central nervous system that play important roles in the generation and control of cyclic breathing.	LGF	MCQ/SEQ
		119	Give three examples of reflexes involving pulmonary receptors that influence breathing frequency and tidal volume. Describe the receptors and neural pathways involved.	LGF	MCQ/SEQ
		120	List the anatomical locations of chemoreceptors sensitive to changes in arterial PO <sub>2</sub> , PCO <sub>2</sub> , and pH that participate in the control of ventilation. Identify the relative importance of each in sensing alterations in blood gases.	LGF	MCQ/SEQ

		121	Describe how changes in arterial PO <sub>2</sub> and PCO <sub>2</sub> alter alveolar ventilation, including the synergistic effects when PO <sub>2</sub> and PCO <sub>2</sub> both change.	LGF	MCQ/SEQ
		122	Describe the significance of the feedforward control of ventilation (central command) during exercise, and the effects of exercise on arterial and mixed venous PCO <sub>2</sub> , PO <sub>2</sub> , and pH.	LGF	MCQ/SEQ
		123	Describe voluntary control of respiration	LGF	MCQ/SEQ
		124	Describe the effect of irritant receptors, J-receptors, brain edema and anesthesia on breathing.	LGF	MCQ/SEQ
	Common Respiratory abnormalities	125	Describe periodic breathing and basic mechanism of Cheyne-Stokes breathing	LGF	MCQ/SEQ
		126	Define sleep apnea	LGF	MCQ/SEQ
		127	Describe the pathophysiology of	LGF	MCQ/SEQ



			Obstructive sleep apnea and central sleep apnea.		
		128	Describe the pathophysiology of specific pulmonary abnormalities:	LGF	MCQ/SEQ
		129	Describe hypoxia	LGF	MCQ/SEQ
		130	Describe cyanosis	LGF	MCQ/SEQ
		131	Describe the effect of aging on lung volumes, lung and chest wall compliance, blood gases, and respiratory control.	LGF	MCQ/SEQ
Biochemistry			Define Enzymes	LGF	MCQ/SEQ
			Define activation energy	LGF	MCQ/SEQ
			Define Gibbs Free energy	LGF	MCQ/SEQ
			Explain the general structure of enzymes	LGF	MCQ/SEQ
			Define co-factors	LGF	MCQ/SEQ
			Explain the function of co-factors	LGF	MCQ/SEQ
			Enlist different types of co-factors Define different parts and forms of enzymes	LGF	MCQ/SEQ

			Describe the factors involved in structure of enzymes	LGF	MCQ/SEQ
			Describe the mechanism of Enzyme activity	LGF	MCQ/SEQ
			Define catalysis	LGF	MCQ/SEQ
			Explain different mechanism of catalysis	LGF	MCQ/SEQ
			Explain the Principals for Nomenclature of enzymes	LGF	MCQ/SEQ
			Classify enzymes on basis of functions	LGF	MCQ/SEQ
			Enlist the factors affecting the activity of enzymes	LGF	MCQ/SEQ
			Describe roles of factors affecting enzyme activity	LGF	MCQ/SEQ
			Define enzyme kinetics	LGF	MCQ/SEQ
			Explain different areas of enzyme kinetics	LGF	MCQ/SEQ
			Describe the role of Km in Enzyme kinetics		
			Define Isoenzymes (Isozymes)	LGF	MCQ/SEQ
			Explain Factors affecting the properties of isozymes	LGF	MCQ/SEQ
			Explain the role of enzymes as a diagnostic tool	LGF	MCQ/SEQ
Forensic	Asphyxia	189	Define Asphyxia	LGF	MCQ/SEQ

Medicines					
		190	Describe different types of Asphyxia	LGF	MCQ/SEQ
		191	Identify classical signs of asphyxia	LGF	MCQ/SEQ
Medicine	Introduction to Respiratory symptomatology	192	Enumerate the various symptoms of respiratory disorders	LGF	MCQ/SEQ
	PFT`s	193	Interpret the Pulmonary Function Tests	LGF	MCQ/SEQ
	ARDS	194	Discuss acute lung injury and its correlation Acute Respiratory Distress Syndrome	LGF	MCQ/SEQ
		195	Describe the causes of Acute Respiratory Distress Syndrome	LGF	MCQ/SEQ
		196	Discuss the morphology of Acute Respiratory Distress Syndrome	LGF	MCQ/SEQ
				LGF	MCQ/SEQ
<b>Psychomotor and Affective domain</b>					
<b>Breathlessness</b>	Physiology	1	Draw a normal spiogram, labeling the	LGF	MCQ/SEQ

			four lung volumes and four capacities.		
		2	List the volumes that comprise each of the four capacities.	LGF	MCQ/SEQ
		3	Identify which volume and capacities cannot be measured by spirometry.	LGF	MCQ/SEQ
		4	Define the factors that determine total lung capacity, functional residual capacity, and residual volume.	LGF	MCQ/SEQ
		5	Describe the mechanisms responsible for the changes in those volumes that occur in patients with emphysema and pulmonary fibrosis.	LGF	MCQ/SEQ
		6	Differentiate between the two broad categories of restrictive and obstructive lung disease, including the spirometric abnormalities associated with each category.	LGF	MCQ/SEQ
		7	Examine the chest of the subject	LGF	MCQ/SEQ
		8	Calculate the respiratory rate of the	LGF	MCQ/SEQ

			subject		
		9	Determine the peak expiratory flow (PEF) by peak flow meter	LGF	MCQ/SEQ
		10	Describe the use of inhaler	LGF	MCQ/SEQ
		11	Demonstrate the use of inhaler to the subject	LGF	MCQ/SEQ
Cough and Hemoptysis	Histology		Identify the various microscopic tissue types of the Respiratory system <ul style="list-style-type: none"> <li>z Epithelium of the respiratory system</li> <li>z Trachea</li> <li>z Bronchi</li> <li>z Bronchioles</li> <li>z Alveoli</li> </ul>	LGF	MCQ/SEQ

## Teaching and learning strategies:

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

- Interactive Lectures
- Hospital / Clinic visits
- Small Group Discussion
- Skills session
- Self-Directed Study



### **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. Interactive lectures are classes in which the instructor breaks the lecture at least once per class to have students participate in an activity that lets them work directly with the material.

- The instructor might begin the interactive segment with an engagement trigger that captures and maintains student attention.
- Then the instructor incorporates an activity that allows students to apply what they have learned or give them a context for upcoming lecture material.

- As the instructor feels more comfortable using interactive techniques he or she might begin to call upon a blend of various interactive techniques all in one class period.

#### **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):**

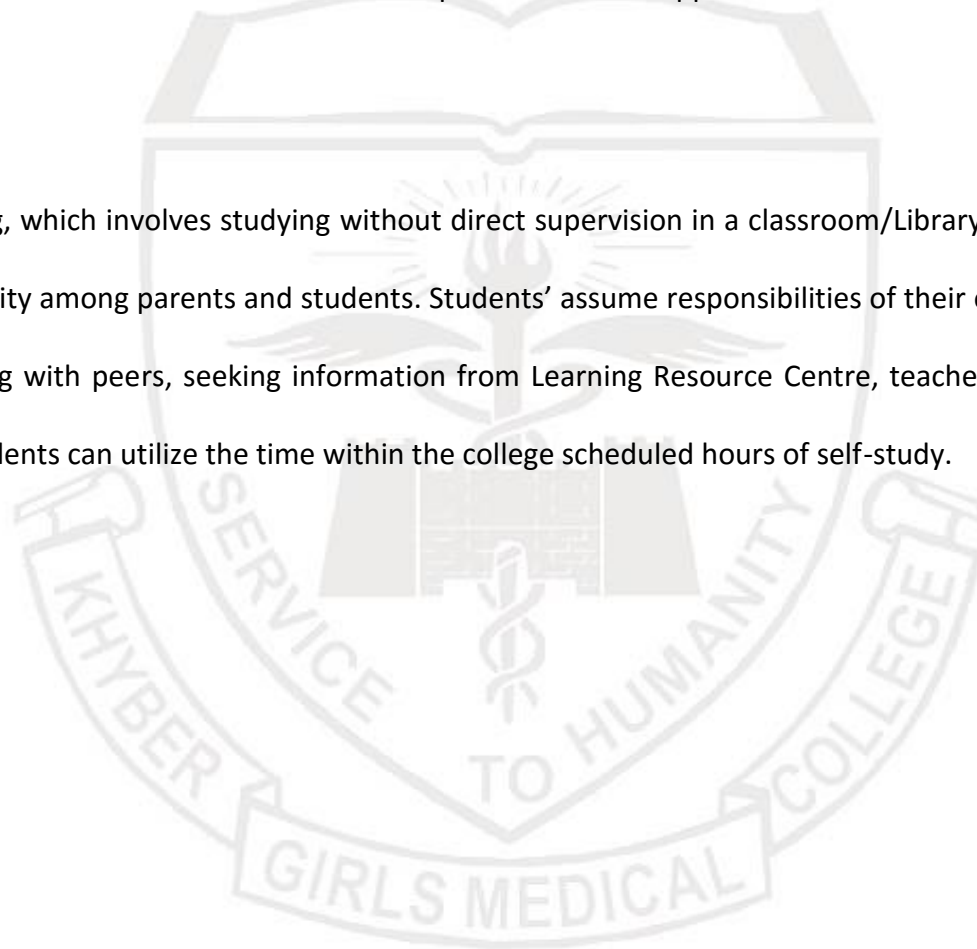
The shy and less articulate are more able to contribute. Students learn from each other. Everyone gets more practice at expressing their ideas. A two way discussion is almost always more creative than individual thoughts. Social skills are practiced in a 'safe' environment e.g. tolerance, cooperation. This format helps students to clarify concepts acquire skills or attitudes. Students exchange opinions and apply knowledge gained from lectures, tutorials and self-study. The facilitator role is to ask probing questions, summarize, or rephrase to help clarify concepts.

**Skills/Practical session:**

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

**Self-Directed learning (SDL):**

Self-directed learning, which involves studying without direct 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.





## Time tables:

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

## Assessment tools:

Theoretical knowledge is tested by a written examination system constituted by multiple choice questions (MCQ/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 120 MCQ/SEQs and will be compiled according to the shared blueprint.

### Short Essay Questions (SEQ)

Short answer questions generally ask for brief, text-based responses and may also be referred to as *fill-in-the-blank*; or *completion* questions.

Variations of the short answer question may request a list of terms or rules in which the order is not important, or may require a numerical or formula response.

Here is some general information about short answer questions:

- Does not measure interpretation.
- Can be used to check for preciseness such as correct spelling (good when using computer grading), proper or specific names of things, especially factual knowledge, and proper creation of formulas.
- Requires specific, definite, exact information.
- Can be used to discriminate whether errors can be detected in a diagram, for example.

### Advantages of Short Answer Questions

- Easy to write.
- Reduces possibility of guessing.

- Can have a lengthy stem such as a paragraph. (Caution: You generally should not expect an exact answer character-by-character.)
- May be easy to score if the required answer is short.

### **Objective Structured Practical Examination (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, unobserved, interactive and rest stations.
- Observed and interactive stations will be assessed by internal or external examiners.
- Unobserved will be static stations in which students will have to answer the questions related to the given pictures, models or specimens the provided response sheet.
- Rest station is a station where there is no task given, and in this time student can organize his/her thoughts.
- The Block OSPE will be comprise of 18 examined station and 7 rest stations. The stations will be assigned according to the shred blueprint.

## Internal Evaluation:

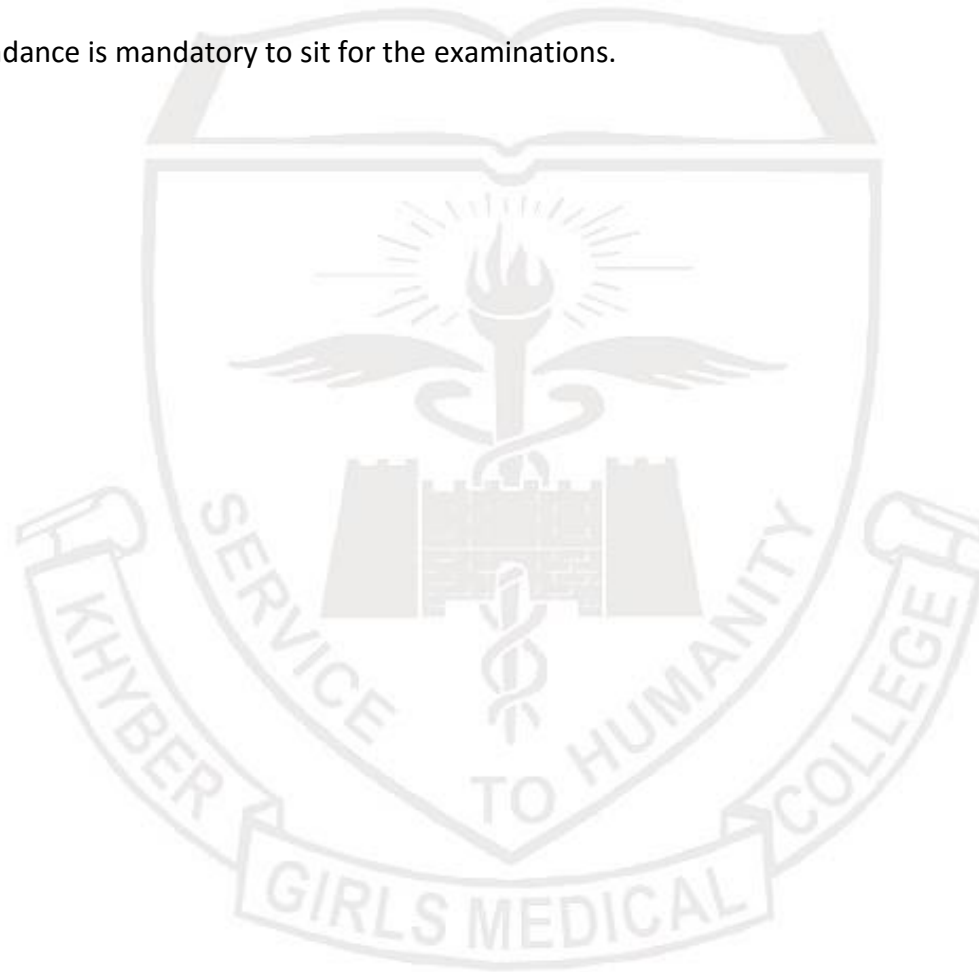
Internal evaluation is a process of quality review undertaken within an institution for its own ends. 10% marks of internal evaluation will be added to final marks. This 10% will be based on

<b>Distribution of 13 Marks for block C paper</b>	
<b>Marks obtained</b>	<b>Average of Percentage in Block exam and Pre Professional exam.</b>

<b>Distribution of 10 Marks for Block E OSPE/OSPE</b>	
<b>Marks obtained</b>	<b>Average of percentage in Block OSPE Exam , Block Pre Prof OSPE and module viva</b>

## Attendance Requirement:

More than 75% attendance is mandatory to sit for the examinations.



## Learning Resources for Students

### Anatomy

- Snell Neuroanatomy
- B.D Churasia
- Nelter Atlas
- Langman embryology
- Keithalmore embryology
- Laiq Hassain Basic Histology
- Difore Atlas Histology

### Physiology

- Guyton nd Hall physiology
- Ganong physiology
- Human Physiology from cells to system by lauralee sherwood
- BRS Physiology
- Neuroscience by Dale Purves

### Biochemistry

- Chatterjee text book of Biochemistry
- Harpers Biochemistry
- Lippincotts Biochemistry
- Satya Narayan biochemistry

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