



CVS-I STUDY GUIDE

1st Year MBBS

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



“Excellence in health care, research, teaching and training in the service of Humanity”

Khyber Girls Medical College: Mission

The mission of KGMC is to promote compassionate and professional health care leaders Who are knowledgeable, skillful, and community oriented lifelong learners serving humanity through evidence based practices.

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.

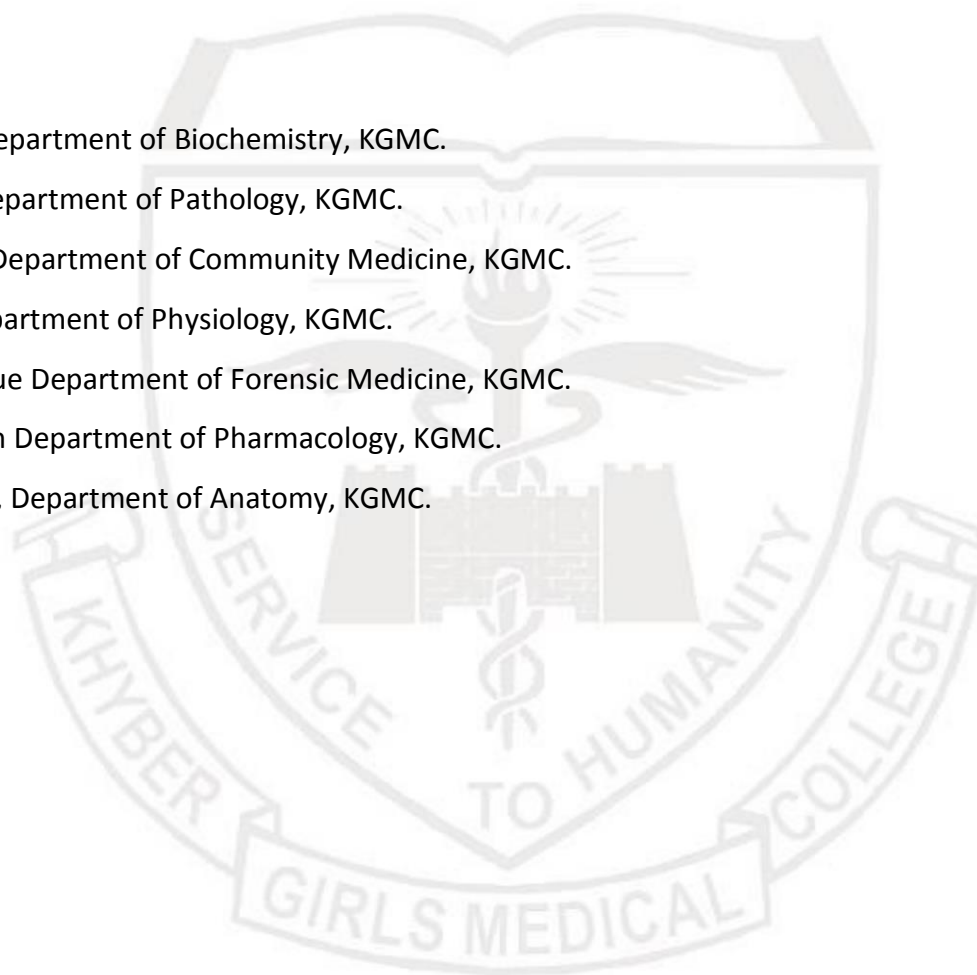
Medical Education

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

- Dr. Naveed Afzal Khan, Department of Medical Education, KGMC.
- Dr. Khurram Naushad, 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 CVS

1. Dr. Gul Muhammad, Senior Lecturer Physiology ..., Module coordinator
2. Dr. Naheed Mahsood Associate Professor **DME**Module Secretary
3. Dr. Naveed Afzal Khan Coordinator DMEModule Secretary
4. Dr. Khurram Naushad Lecturer **DME**Module Secretary
5. Dr. Shabnam Gul Senior Lecturer **Admin**.....Member:
6. Dr. Riffat Sultana Professor **Physiology**.....Member
7. Dr. Shakila, Associate Professor **Community Medicine**.....Member
8. Dr. Shahab Udin, Associate Professor **Anatomy**Member
9. Dr. Ayesha Jamil Associate Professor **Pharmacology**.....Member:
10. Dr. Afsheen Mehmood Assistant Professor **Physiology**.....Member
11. Dr. Fawad Raheem, Assistant Professor **Medical unit**Member
12. Dr. Ameer Abbas Assistant Professor **psychiatry**Member:
13. Dr. Munir Hussain Assistant Professor **Pathology**.....Member:
14. Dr. Naheed Siddique Assistant Professor **Forensic Medicine**Member
15. Dr. Kalsoom Tariq Assistant Professor **Biochemistry**.....Member:
16. Dr. Yousaf Jan Assistant Professor **Surgical B**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 Curricular Outcomes of the MBBS Program for a Graduating Doctor according to the PMDC are as follows:

1. Knowledgeable

Knowledgeable about the diseases and health conditions prevalent in the population of Pakistan and use Evidence-based medicine to provide best possible cost-effective care.

2. Skillful

Skillful in History taking and Physical examination to compassionately deal with a patient.

3. Community health promoter

Take appropriate decisions and actions for protecting and promoting the health of their community.

4. Critical Thinker

Evaluate critically the patient data to effectively deal with complexity of medical decisions for the best possible outcomes using evidence-based practices in service of humanity.

5. Professional

Display professional values (honesty, accountability, cultural and religious sensitivity), attitudes and behaviors (empathy, ethics, good communication skills and lifelong learner) that embody good medical practice.

6. Researcher

Exhibit a spirit of inquisitiveness, inventiveness, and ethical conduct while carrying out research in accordance with the prescribed guidelines.

7. Leader and role Model

Demonstrate exemplary conduct and leadership in Advancing healthcare, enhancing medical education, and Enhancing the trust of the public in the medical profession by being exceptional role models

KNOWLEDGE

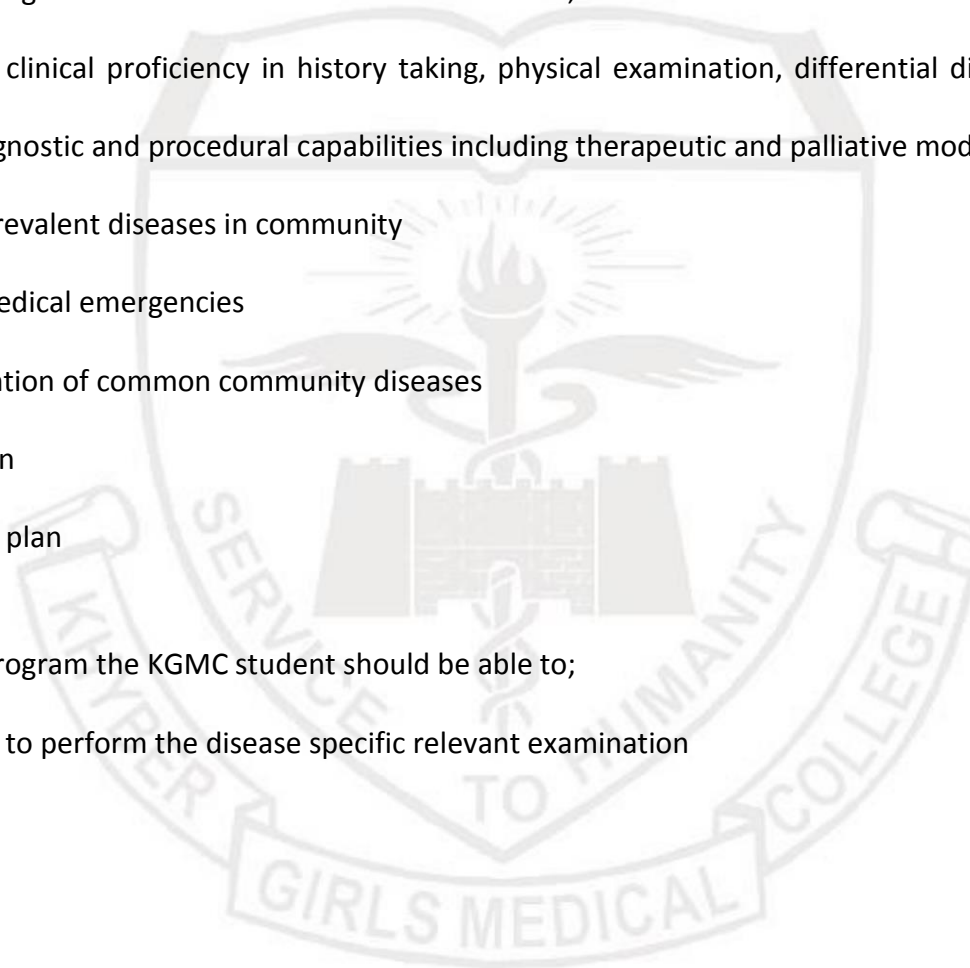
By the end of five year MBBS program the KGMC student should be able to;

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

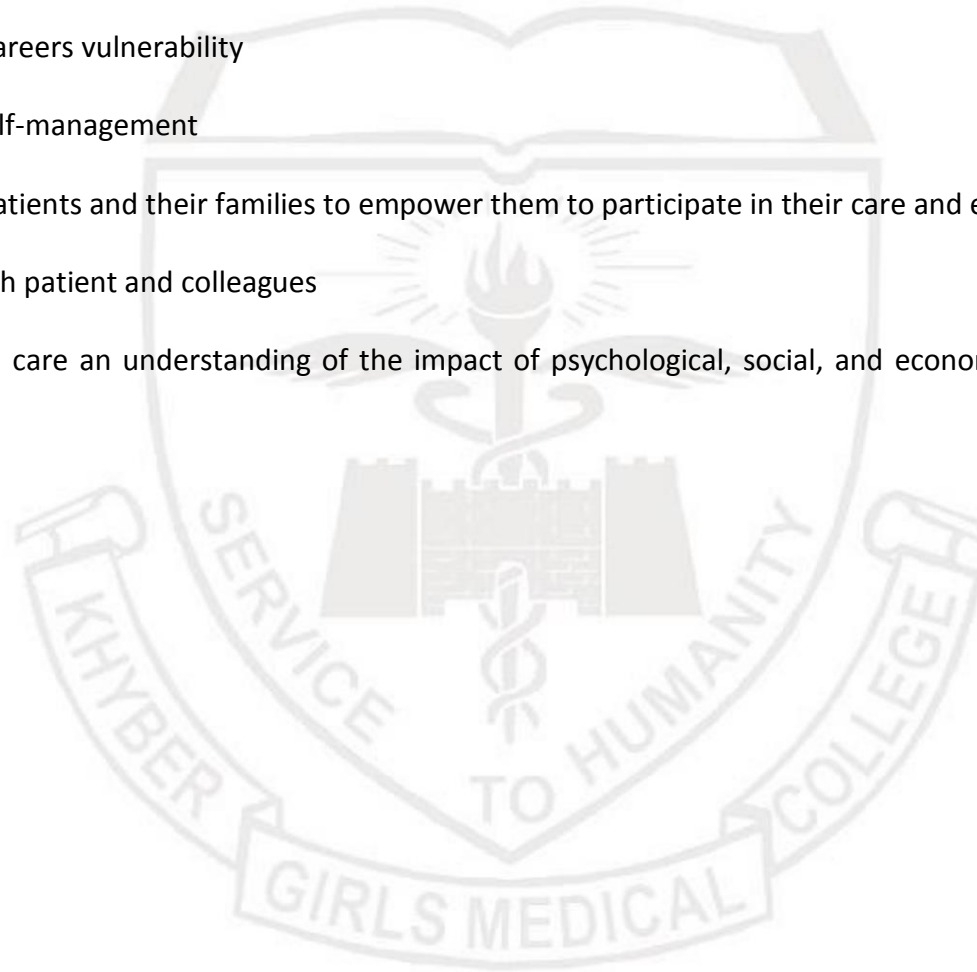


2. Respond to common medical emergencies
3. Master the skill of first aid
4. Perform BLS
5. Apply the best evidenced practices for local health problems

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 cardiovascular system

The cardiovascular system (CVS) moves vital nutrients, gases and hormones around the body. The CVS is made up of the heart, lungs and blood vessels, all working together.

The heart functions as a pump.

The blood vessels act as pipes, carrying blood through the body.

The lungs supply the blood with oxygen and remove its carbon dioxide.

A number of complex nerve and hormone systems keep the CVS in balance with the body's changing needs for oxygen and nutrients.

Examination of CVS
Auscultation(Heart Sounds)



Themes

1- Chest pain- (1 week)	2- Breathlessness and ankle swelling- (2 weeks)	3- Blood Pressure- (1 week)
4- Palpitations (1 week)		

GENERAL LEARNING OUTCOMES

At the end of this module, the students will be able to;

- 1) Describe the structure and surface markings of the heart, valves and great vessels
- 2) Describe the steps of development of the heart
- 3) Describe the steps of development of arterial, venous and lymphatic system
- 4) Describe the conduction system of the heart
- 5) Describe the anatomy of valves of the heart
- 6) Describe the microscopic structure of myocardium, and blood vessels
- 7) Describe the cardiac cycle
- 8) Discuss cardiac output, and venous return
- 9) Discuss blood pressure and its regulation
- 10) Discuss coronary circulation and diseases associated with it
- 11) Describe the mechanisms and types of circulatory shock and associated compensatory mechanisms
- 12) Describe the anatomy and common pericardial diseases
- 13) Describe the cardiac enzymes
- 14) Discuss the hyperlipidemias and the roles lipoproteins and cholesterol in the development of atherogenesis
- 15) Describe the mechanisms of impulse generation, conduction and excitation of myocardium

Skill

1. Measure the blood pressure.
2. Measure the effect of posture and exercise on blood pressure.
3. Examine the arterial pulses.
4. Auscultate the heart sounds.
5. Perform systematic analysis of ECG
6. Identify normal cardiac shadow, borders and cardiomegaly on chest radiographs.
7. Identify the position of borders and valves of the heart by surface marking on model / simulator
8. Palpate and find apex beat, and auscultatory areas in the chest of the subject provided and describe their significance.
9. Demonstrate the use of Stethoscope for Auscultation.
10. Differentiate between normal and displaced apex beat
11. Perform basic life support.
12. Interpretation of cardiac enzymes
13. Detection of lipids in a given sample

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 task
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

Theme1- Chest Pain

Subject	Topic	Learning objectives	Teaching strategy	Assessment
Anatomy	Surface anatomy	Describe the surface marking of the heart	Dissection/demo	MCQ/SEQ
		Describe the surface marking of the heart valves	Dissection/demo	MCQ/SEQ
		Illustrate the surface marking of the aorta on models / x-rays	Dissection/demo	MCQ/SEQ
		Describe the surface marking of the superior vena cava	Dissection/demo	MCQ/SEQ
		Describe the surface marking of the inferior vena cava	Dissection/demo	MCQ/SEQ
		Describe the gross structure of the heart	Dissection/demo	MCQ/SEQ
	Coronary circulation	Describe the coronary arteries	Dissection/demo	MCQ/SEQ
		Enlist the branches of each main artery	Dissection/demo	MCQ/SEQ
		Describe the anastomosis of coronaries	Dissection/demo	MCQ/SEQ
		Identify the area of the heart supplied by a coronary artery and its branches	Dissection/demo	MCQ/SEQ
		Describe the venous drainage of the heart	Dissection/demo	MCQ/SEQ
		Describe the lymphatic drainage of the heart	Dissection/demo	MCQ/SEQ

	Pericardium	Define pericardium	Dissection/demo	MCQ/SEQ
		Describe different reflections of pericardium		MCQ/SEQ
		Identify entry & exit of vessels of heart via pericardium		MCQ/SEQ
		Define the following clinical condition; pericarditis pericardial effusion cardiac Tamponade		MCQ/SEQ
Histology	Histology of heart muscles	Explain the characteristics of cardiac muscle cell	LGF	MCQ/SEQ
		Explain the Structure of Intercalated disc	LGF	MCQ/SEQ
		Define the junctional specializations making up the intercalated disk	LGF	MCQ/SEQ
		Describe identification of different microscopic views of Cardiac muscle and its ultra-structures	LGF	MCQ/SEQ
		Differentiate histologically between cardiac and skeletal muscle and smooth muscles	LGF	MCQ/SEQ
		Enumerate histological layers of heart wall	LGF	MCQ/SEQ
Physiology	Cardiac muscles	Explain the physiologic anatomy of the cardiac muscle	LGF	MCQ/SEQ
		Describe the properties of the cardiac muscle	LGF	MCQ/SEQ
	Coronary	Describe the physiologic basis coronary	LGF	MCQ/SEQ

	circulation	circulation		
		Describe the steps of coronary thrombosis	LGF	MCQ/SEQ
		Describe the etiology of coronary thrombosis	LGF	MCQ/SEQ
Biochemistry	Cardiac enzymes	Identify the enzymes that increase in myocardial infarction	LGF	MCQ/SEQ
	Lipids and cholesterol	Describe the Chemical Structure and function of cholesterol	LGF	MCQ/SEQ
		Describe the fate of cholesterol in the body	LGF	MCQ/SEQ
		Define and Classify lipids	LGF	MCQ/SEQ
		Describe the functions of lipids in the body	LGF	MCQ/SEQ
		Classify lipoproteins and their functions	LGF	MCQ/SEQ
		Describe Cardiac enzymes and their pattern of elevation in ischemic heart diseases	LGF	MCQ/SEQ
		Describe the role of Na, K, Ca and Mg in cardiac muscles contractility and their biochemical abnormalities	LGF	MCQ/SEQ
		Describe the cardiac manifestations of vitamin B1 deficiency	LGF	MCQ/SEQ
Pharmacology		Enlist the groups of drugs used in the treatment of CAD (angina and MI)	LGF	MCQ/SEQ
		Enlist the groups of lipid lowering drugs	LGF	MCQ/SEQ

Pathology		Describe the risk factors, and lab. Diagnosis of CAD	LGF	MCQ/SEQ
		Define and Enlist the stages of atherosclerosis	LGF	MCQ/SEQ
Forensic medicine		Describe the medicolegal aspects of sudden death due to cardiovascular diseases	LGF	MCQ/SEQ
Community Medicine	Prevention of CVD	Describe primordial, primary, secondary and tertiary prevention of CV diseases in community	LGF	MCQ/SEQ
Embryology	Fetal circulation	Describe the physiological changes in circulation after birth	LGF	MCQ/SEQ
	Cardiac developmental anomalies	Enlist the developmental anomalies of heart	LGF	MCQ/SEQ
		Describe the congenital anomalies of the heart. ASD VSD PDA Tetralogy of Fallot transposition of the great vessels Hemangiomas and Telangiectasias	LGF	MCQ/SEQ

Physiology	Cardiac cycle	Describe the Cardiac cycle	LGF	MCQ/SEQ
		Describe the concept of systole and diastole,	LGF	MCQ/SEQ
		Describe the role of atria and ventricles as pumps,	LGF	MCQ/SEQ
		Describe the functions of heart valves,	LGF	MCQ/SEQ
		Correlate the cardiac cycle events with ECG	LGF	MCQ/SEQ
		Describe the mechanism of production of normal and abnormal heart sounds	LGF	MCQ/SEQ
		Relate heart sounds with cardiac cycle,	LGF	MCQ/SEQ
		Describe the metabolism and oxygen utilization of cardiac muscle	LGF	MCQ/SEQ
		Describe the regulation of cardiac cycle	LGF	MCQ/SEQ
	Cardiac output	Describe pressure volume loop (end-systolic volume / end-diastolic volume / ejection fraction / systolic volume / systolic work output)	LGF	MCQ/SEQ
		Explain the Frank-Starling mechanism of the heart for the control of cardiac output by venous return	LGF	MCQ/SEQ
		Describe the methods for measuring of cardiac output	LGF	MCQ/SEQ

		Describe normal cardiac output and venous return during rest and during activity	LGF	MCQ/SEQ
		Enlist the causes of abnormally high and abnormally low cardiac output	LGF	MCQ/SEQ
		Explain the mechanisms of normal cardiac contractility and the role of calcium ion/ ATPase pumps	LGF	MCQ/SEQ
		Explain cardiac output (regulation/measurement) and peripheral resistance and its regulation	LGF	MCQ/SEQ
		Explain the factors regulating cardiac output and venous return.	LGF	MCQ/SEQ
	Blood flow	Describe the Biophysics and Interrelationships of Pressure, Flow, and Resistance in terms of Ohm's law and Poiseuille's Law	LGF	MCQ/SEQ
		Describe starling forces	LGF	MCQ/SEQ
		Describe regulation of blood flow	LGF	MCQ/SEQ
		Define basal tone.	LGF	MCQ/SEQ
		List several substances potentially involved in local metabolic control of vascular tone.	LGF	MCQ/SEQ
		State the local metabolic vasodilator hypothesis	LGF	MCQ/SEQ

		Describe physiological Vasodilators and Vasoconstrictors and their mechanisms	LGF	MCQ/SEQ
		Describe the factors affecting the local blood flow including auto-regulation.	LGF	MCQ/SEQ
		Describe the function of capillaries	LGF	MCQ/SEQ
		Describe circulatory changes during exercise	LGF	MCQ/SEQ
		Describe blood flow to different organs like brain, heart, liver and skin during exercise	LGF	MCQ/SEQ
	Functions of heart valves	Describe the functions of mitral, tricuspid, aortic and pulmonic valves	LGF	MCQ/SEQ
		Describe the hemodynamics and sequel related to stenosis and regurgitation of heart valves	LGF	MCQ/SEQ
	Lymphatic system	Describe the function of lymphatic system in the maintenance of interstitial fluid volume.	LGF	MCQ/SEQ
		Describe the effects of Interstitial Fluid Pressure on Lymph Flow.	LGF	MCQ/SEQ
		Describe how changes in capillary hydrostatic pressure, plasma oncotic pressure, capillary permeability, and lymphatic function can lead to tissue edema	LGF	MCQ/SEQ
Medicine	Heart failure	Define Heart failure Differentiate between right-sided Heart failure	LGF	MCQ/SEQ

Anatomy				
	Histology of blood vessels	Describe the histological composition of vessel	LGF	MCQ/SEQ
		Describe the microscopic structure of artery and vein	LGF	MCQ/SEQ
		Differentiate histologically between artery and vein under light microscope	LGF	MCQ/SEQ
		Describe the histological composition of lymphatic channels	LGF	MCQ/SEQ
Embryology	Development of arteries and veins	Describe the development of arterial system	LGF	MCQ/SEQ
		Describe the development of venous system	LGF	MCQ/SEQ
		Describe the congenital abnormalities in in the vessels. - Coarctation of Aorta		MCQ/SEQ
Physiology	Blood Pressure	Define blood pressure		MCQ/SEQ
		Describe the causes of High / low BP		MCQ/SEQ
		Discuss the mechanisms for rapid and long		MCQ/SEQ

		term control of blood pressure (including Renin Angiotensin system)		
		Describe the effects of sympathetic and parasympathetic stimulation on the heart and circulation		MCQ/SEQ
	Circulatory Shock	Define Circulatory Shock		MCQ/SEQ
		Explain the physiologic causes of circulatory shock		MCQ/SEQ
		Explain the stages of circulatory shock		MCQ/SEQ
		Describe cardiogenic shock	LGF	MCQ/SEQ
		Describe Hemorrhagic Shock	LGF	MCQ/SEQ
		Describe of Neurogenic Shock	LGF	MCQ/SEQ
		Describe Anaphylactic Shock	LGF	MCQ/SEQ
		Describe Septic Shock	LGF	MCQ/SEQ
		Explain the physiology of treatment in Shock	LGF	MCQ/SEQ
Pharmacology		Describe the mechanisms of drugs used in the treatment of Hypertension	LGF	MCQ/SEQ
Community medicine		Describe the preventive strategies of hypertension	LGF	MCQ/SEQ

5- Palpitations

Anatomy	Conduction system of the heart	Describe the different components of conduction system <ul style="list-style-type: none"> □ SA Node □ AV Node □ Bundle of His □ Purkenje Fibers 	LGF	MCQ/SEQ
		Describe the sympathetic innervation of heart	LGF	MCQ/SEQ
		Describe the parasympathetic innervation of the heart	LGF	MCQ/SEQ
Physiology	Excitation and contraction of cardiac muscles	Describe the excitation–contraction process in cardiac muscle. Describe Chronotropic, Inotropic and Dromotropic Effects	LGF	MCQ/SEQ
		Describe Chronotropic, Inotropic and Dromotropic Effects	LGF	MCQ/SEQ
		Differentiate excitation–contraction process in cardiac and skeletal muscle cells	LGF	MCQ/SEQ
		Describe gap junctions and the significance of functional syncytium	LGF	MCQ/SEQ
		Explain phases of cardiac muscle action potential	LGF	MCQ/SEQ
		Describe the characteristics of cardiac action potentials and the role of “slow calcium” channels in causing plateau and its significance	LGF	MCQ/SEQ
		Describe the significance of AV nodal Delay	LGF	MCQ/SEQ

		Define Pacemaker and explain why SA node is the normal pacemaker of the heart	LGF	MCQ/SEQ
		Define Ectopic Pacemaker and describe its causes	LGF	MCQ/SEQ
		Describe the effects of sympathetic and parasympathetic stimulation on the heart rate and conduction of cardiac action potentials	LGF	MCQ/SEQ
		Define various types of refractory periods	LGF	MCQ/SEQ
		Differentiate the refractory period of cardiac muscle with that of skeletal muscle	LGF	MCQ/SEQ
		Describe the significance of prolonged action potential in cardiac muscle	LGF	MCQ/SEQ
		Describe the physiological anatomy of the sinus node	LGF	MCQ/SEQ
		Define automaticity and rhythmicity and conductivity	LGF	MCQ/SEQ
		Describe the specialized excitatory and conductive pathway of the cardiac muscle tissue	LGF	MCQ/SEQ
	ECG	Describe the characteristics of normal ECG, time duration of waves, segments and voltages	LGF	MCQ/SEQ
		Explain how to record ECG	LGF	MCQ/SEQ
		Describe the AV nodal, ventricular impulse conduction	LGF	MCQ/SEQ

		Interpret ECG paper and its calibration	LGF	MCQ/SEQ
Community Medicine	CVD prevention	Identify the major risk factors which contribute to common diseases of the cardiovascular system	LGF	MCQ/SEQ
		Enumerate modifiable and non-modifiable risk factors of CV diseases	LGF	MCQ/SEQ
		Apply primordial, primary, secondary and tertiary prevention of CV diseases in community	LGF	MCQ/SEQ

Psychomotor domain				
Chest Pain	Anatomy	1- Identify the heart & its coverings in the model / dissected specimen 2- Identify the heart and major blood vessels in cadaver/dissected specimen 3- Identify the chambers of the heart. 4- Identify the internal structures of various chambers of the heart. 5- Identify the Cardiac Muscle under the microscope	Practical	OSCE
	Physiology	6- Perform basic life support. (Important)	Practical	OSCE
	Biochemistry	7- Interpretation of cardiac enzymes 8- Detection of lipids in a given sample	Practical	OSCE
Blood Pressure		9- Identify salient features of a medium sized artery & vein in a cross-section under microscope. 10- Identify the histological differences between medium size artery & vein under microscope. 11- Describe the histological differences between large size artery & vein.	Practical	OSCE

Breathlessness and ankle swelling	Clinical	12- Identify normal cardiac shadow, borders and cardiomegaly on chest radiographs. 13- Identify the position of borders and valves of the heart by surface marking on model / simulator 14- Palpate and find apex beat, and auscultatory areas in the chest of the subject provided and describe their significance. 15- Demonstrate the use of Stethoscope for Auscultation. 16- Differentiate between normal and displaced apex beat	Practical	OSCE
	Physiology	17- Measure the blood pressure. 18- Measure the effect of posture and exercise on blood pressure. 19- Examine the arterial pulses. 20- Auscultate the heart sounds.	Practical	OSCE
Palpitations		21- Perform systematic analysis of ECG	Practical	OSCE
Affective domain				
PRIME		22- Demonstrate ability to give and receive feedback, respect for self and peers. 23- Carry out practical work as instructed in an organized and safe manner	Practical	OSCE

		<p>24- Demonstrate empathy and care to patients.</p> <p>25- Develop respect for the individuality and values of others - (including having respect for oneself) patients, colleagues and other health professionals</p> <p>26- Organize& distribute tasks</p> <p>27- Exchange opinion & knowledge</p> <p>28- Develop communication skills and etiquette with sense of responsibility.</p> <p>29- To equip themselves for teamwork</p> <p>30- Regularly attend the classes</p> <p>31- Role play for the counseling of patients with risk factors for coronary heart diseases on modification of life style</p> <p>32- Role play for the counseling of patients with risk factors for coronary heart diseases on modification of life style</p>		
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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):

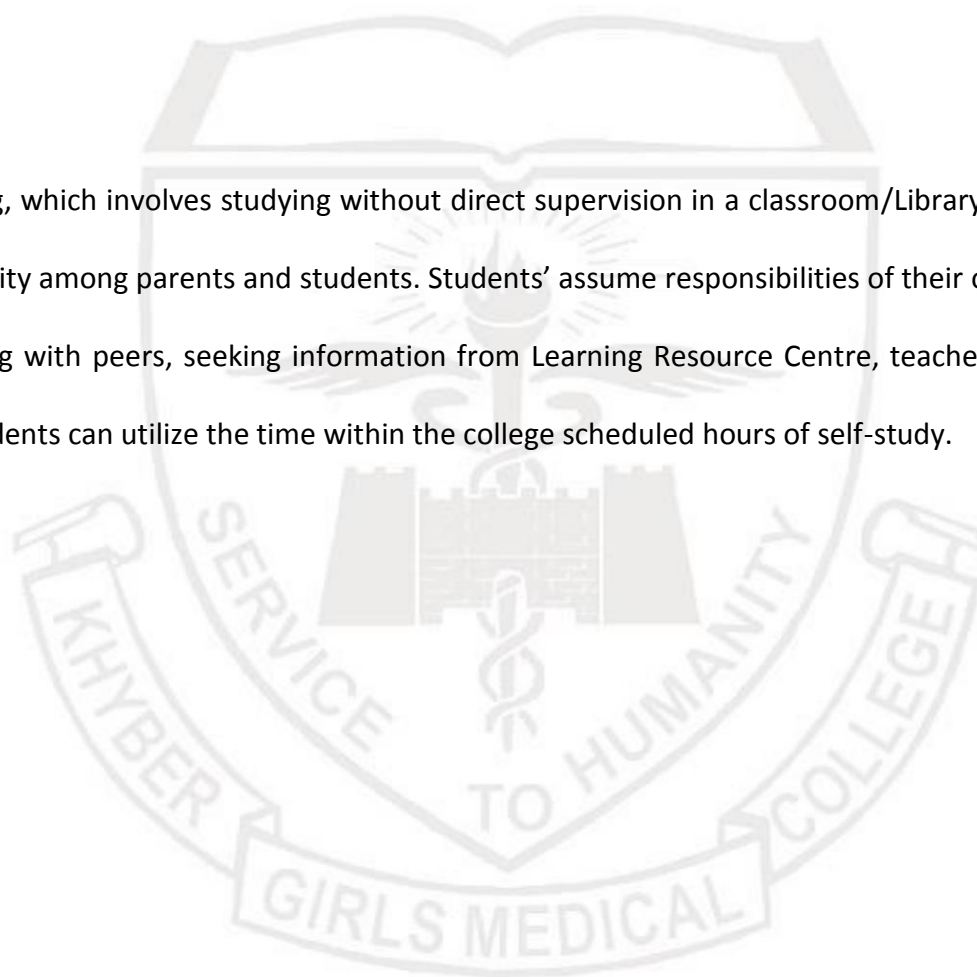
The shy and less articulate are more able to contribute. Students learn from each other. Everyone gets more practice at expressing their ideas. A two way discussion is almost always more creative than individual thoughts. Social skills are practiced in a 'safe' environment e.g. tolerance, cooperation. 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:

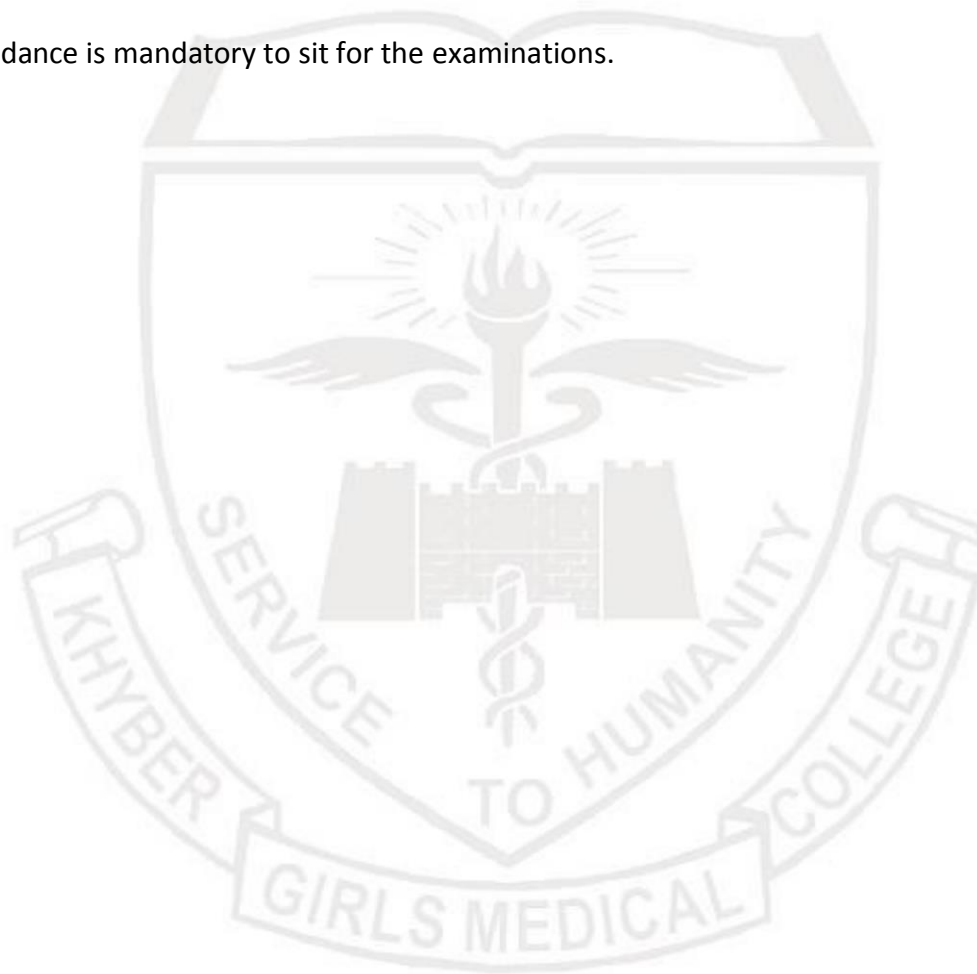
Internal evaluation is a process of quality review undertaken within an institution for its own ends. 10% marks of internal evaluation will be added to final marks. This 10% will be based on

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

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

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