

## **Rehman Medical College (RMC) - Mission**

RMC mission is to train students through a research-intensive, student-based curriculum that shall promote leadership, collaborative discoveries, and innovation. The mission of RMC will improve community health through their graduates who shall be cognizant of the needs of the community, hence acting as good role model.

## **Khyber Medical University (KMU) - Vision**

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

## GRADUATE LEARNING OUTCOMES – MBBS Programme

### Spiral I

#### (Knowledge, Skills & Behaviours)

1. Basic structure function and biochemistry of the human body
2. Applied aspect of the study of basic medical subjects
3. Levels of healthcare systems in Pakistan
4. Basic communication skills and orientation to hospital based care
5. Behaviours expected of doctors through simulated learning
6. Basic of human psychology and its role in Healthcare professions
7. Preventive healthcare and role of social sciences
8. Basic history taking skills and examination of body systems through simulation / observation
9. Infection control and patient safety
10. Family Practice in Pakistan
11. IT skills
12. Basics of Research medical education

### Spiral II

#### (Professional Knowledge, Skills & Behaviours)

1. Basics & applied aspects of Illness and diseases in Pakistani community
2. Prescription writing and drug side effects in medical profession
3. Interpersonal and communication skills
4. Applied psychology and social accountability of doctors
5. Basics and applied medico-legal aspects in healthcare profession
6. Professionalism, Ethics and Team working
7. Research, Health promotion and education
8. Communicable and non-communicable diseases in Pakistan
9. Family medicine and its scope in Pakistan
10. History taking, Examination, Diagnosis, Management and baseline treatment of patients in ENT and Ophthalmology
11. Clinical diagnosis, examinations in Hospital Placements

### Spiral III

#### (Professional Skills, Values, Behaviours and Knowledge)

1. History taking, examination, procedures, management plans in major and allied clinical specialties
2. Safeguarding patients with value for confidentiality, respect
3. Knowledge of prompt and timely communication in healthcare
4. Performing therapeutic procedures per PMC competency criteria for medical graduates in Pakistan
5. Applied psychological components related to healthcare professions
6. Teamwork, leadership & management in healthcare

## Structure of Outcomes

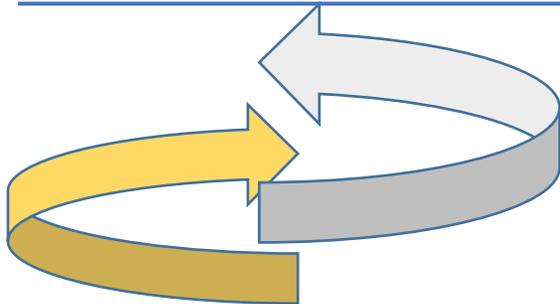
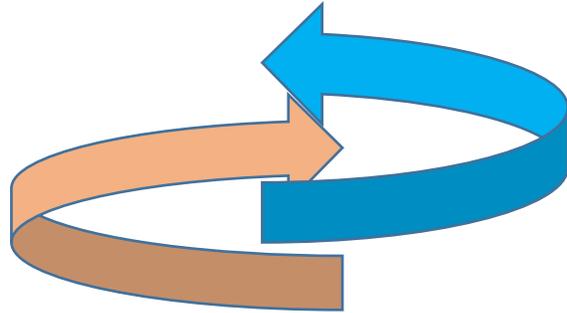
### Outcomes Spiral III

Professional Skills, Values, Behaviours and Knowledge

Clinical diagnosis, management, follow up.  
Patient assessment, therapeutics, procedural skills  
(Regulatory authority set)

Team works, social accountability, applied  
psychological aspects of patient care,  
interpersonal and communication skills.

Professionalism, ethics, patient confidentiality,  
respect for human values applicable in healthcare  
profession.



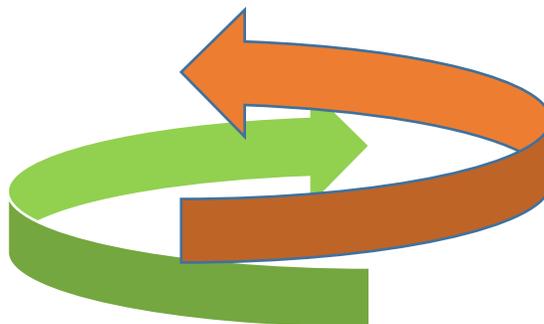
### Outcomes Spiral II

Professional knowledge, skills & Behaviours.  
Introduction to clinical practice in hospital  
and CSC, knowledge of basic and applied  
pharmacology, medico legal aspects of  
healthcare systems in Pakistan. Basics and  
applied pathology, diagnosis, management,  
prescription writing and therapeutics,  
assessment skills in ENT and Ophthalmology

### Outcomes Spiral I

Applied Knowledge, Skills and behaviours  
pertaining to basic sciences, basic clinical  
knowledge & skills relevant to modules of  
1<sup>st</sup> & 2<sup>nd</sup> Professionals. Basics of disease  
and its preventive measures, Healthcare  
systems of Pakistan

Behaviours – Ethics, professionalism,  
social accountability, Research and  
Family medicine



**Graduate Learning Outcomes – End of Spiral III, II & I  
(Professional Skills, Values, Behaviours and Knowledge)**

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The competencies achieved by the graduate at the end of 05 year MBBS course are as below.

Professional Skills, Knowledge & Patient centered care

**1. History taking, examination, procedures, management plans in major and allied clinical specialties. The newly qualified doctor must have**

- a. Achieved the cognitive, psychomotor and behavioural competencies required for patient-centered care.
- b. The ability to work collaboratively with patients, their relatives and colleague to diagnose and manage clinical presentations safely in hospitals (primary and secondary care) and in community.
- c. The ability to perform the core set of practical skills and procedures safely and effectively as per Competencies defined by regulatory authorities of Pakistan, and identify, according to their level of skill and experience, the procedures that need to be carried out under supervision to ensure patient safety.
- d. Be able to make clinical judgements and decisions based on a holistic assessment of the patient and their needs, priorities and concerns.
- e. Cognizance of the importance of the links between pathophysiological, psychological, spiritual, religious, social and cultural factors for each individual.

**2. They must be able to**

- a. Propose adequate patient assessment plans, integrating knowledge of basic structure & function, pathophysiology, psychological, social, religious and cultural factors under indirect supervision.
- b. Order appropriate investigations and care as per needs identified through collaboration with colleagues, patient and relatives.

**3. Must safely undertake the below under indirect supervision.**

- a. an appropriate physical examination (with a relative / chaperone present if appropriate)
- b. a mental and cognitive state examination, including establishing if the patient is a risk to themselves or others, seeking support and making referrals if necessary
- c. a developmental examination for children and young people.
- d. interpret findings from history, physical and mental state examinations
- e. propose a holistic clinical summary, including a prioritised differential diagnosis/diagnoses and problem list
- f. propose options for investigation, taking into account potential risks, benefits, cost effectiveness and possible side effects and agree in collaboration with colleagues if necessary, which investigations to select

- g. interpret the results of investigations and diagnostic procedures, in collaboration with colleagues if necessary
  - h. synthesise findings from the history, physical and mental state examinations and investigations, in collaboration with colleagues if necessary, and make proposals about underlying causes or pathology
  - i. understand the processes by which doctors make and test a differential diagnosis and be prepared to explain their clinical reasoning to others
  - j. make clinical judgements and decisions with a patient, based on the available evidence, in collaboration with colleagues and as appropriate for their level of training and experience, and understand that this may include situations of uncertainty
  - k. take account of patients' concerns, beliefs, choices and preferences, and respect the rights of patients to reach decisions with their doctor about their treatment and care and to refuse or limit treatment
  - l. seek informed consent for any recommended or preferred options for treatment and care
  - m. propose a plan of management including prevention, treatment, management and discharge or continuing community care, according to established principles and best evidence, in collaboration with other health professionals if necessary
  - n. support and motivate the patient's self-care by helping them to recognise the benefits of a healthy lifestyle and motivating behaviour change to improve health and include prevention in the patient's management plan
  - o. recognise the potential consequences of over-diagnosis and over-treatment
- 4. They must be able to (Direct Supervision)**
- a. assess and determine the severity of a clinical presentation and the need for immediate emergency care
  - b. diagnose and manage acute medical and psychiatric emergencies, escalating appropriately to colleagues for assistance and advice
  - c. provide immediate life support
  - d. provide cardiopulmonary resuscitation
- 5. They must be able to (Direct Supervision)**
- a. establish an accurate medication history, covering both prescribed medication and other drugs or supplements, and establish medication allergies and the types of medication interactions that patients experience.
  - b. calculate safe and appropriate medication doses and record the outcome accurately.
  - c. write a safe and legal prescription, tailored to the specific needs of individual patients.
  - d. communicate appropriate information to patients about what their medication is for, when and for how long to take it, what benefits to expect, any important adverse effects that may occur and what follow-up will be required.
  - e. detect and report adverse medication reactions and therapeutic interactions and react appropriately.

- f. recognise the importance of safe prescribing for patients with long term physical and mental conditions or multiple morbidities and medications, in pregnancy, at extremes of age and at the end of life
6. The newly qualified doctor must use information adequately and safely.
  7. They must maintain and know importance of accurate, legible, contemporaneous and comprehensive medical record keeping.
  8. They must comprehend their professional and legal responsibilities when accessing information sources in relation to patient care, health promotion, giving advice and information to patients, and research and education.
  9. Discuss the role of doctors in contributing to the collection and analysis of patient data at a population level to identify trends in wellbeing, disease and treatment, and to improve healthcare and healthcare system.
  10. Apply the principles of health informatics to medical practice.
2. Knowledge of prompt and timely communication in healthcare
    - a. The newly qualified doctors must be able to communicate effectively, openly and honestly with patients, their relatives, carers, and with colleagues, applying patient confidentiality appropriately.
    - b. Demonstrate empathy and compassion.
    - c. Demonstrate effective verbal and non-verbal communication skills.
    - d. Seek support from colleagues for assistance with communication if needed.
    - e. making adjustments to their communication approach if needed, for example for people who communicate differently due to a disability or who speak a different first language
    - f. Communicate by spoken, written and electronic methods (including in medical records) clearly, sensitively and effectively with patients, their relatives, carers or other advocates, and colleagues from medical and other professions. The communication should be particularly effective in below situation although is not limited to these;
      - i. During conflicts and disagreements
      - ii. Sharing news about death of patient or any other “breaking bad news” situation with relatives.
      - iii. Communication with children / young people
      - iv. Communication with patients / relatives with cognitive impairment and learning disabilities.
      - v. While communicating remotely through telecommunication / telemedicine
3. Teamwork, leadership & management in healthcare

The newly qualified doctors must be able to

1. Describe the principles of team working and team building in medical profession
2. Undertake various team roles including, where appropriate, demonstrating leadership and the ability to accept and support leadership by others.
3. Describe theoretical models of leadership and management that may be applied to practices
4. learn and work effectively within a multi-professional and multi-disciplinary team and across multiple care settings.
5. Safely pass on information using clear and appropriate spoken, written and electronic communication
6. Apply flexibility, adaptability and a problem-solving approach to shared decision making with colleagues
7. responding appropriately to requests from colleagues to attend patients.
8. recognise and show respect for the roles and expertise of other health and social care professionals and doctors from all specialties and care settings in the context of working and learning as a multi-professional team.

## **Ethics & Professional Values**

The newly qualified doctor must

- a. behave according to ethical and professional principles as laid down by regulatory authorities in Pakistan and in line with international standards as well.
- b. demonstrate the clinical responsibilities and role of the doctor as per regulatory authorities and college vision and mission.
- c. Show commitment to lifelong learning, through research and professional development
- d. act with integrity, be polite, considerate, trustworthy and honest
- e. take personal and professional responsibility for their actions
- f. recognise the potential impact of their attitudes, values, beliefs, perceptions and personal biases (which may be unconscious) on individuals and groups and identify personal strategies to address this.
- g. demonstrate the principles of patient-centered care.
- h. seek patient consent, or the consent of the person who has parental responsibility in the case of children and young people.
- i. raise and report through informal communication with colleagues and through formal clinical governance and monitoring systems 5 about:
  - a. patient safety and quality of care
  - b. bullying, harassment and undermining
- j. access and analyse reliable sources of current clinical evidence and guidance to make sure their practice is safe and up to date.
- k. demonstrate awareness of the importance of their personal physical and mental wellbeing
- l. manage the personal and emotional challenges of coping with work and workload.

- m. develop a range of coping strategies, such as reflection, debriefing, handing over to another colleague, peer support etc.

### **Legal responsibilities**

Demonstrate knowledge of the principles of the legal framework in which medicine is practised in the jurisdiction in which they are practicing, and have awareness of where further information on relevant legislation can be found.

## **Learning out 1<sup>st</sup> & 2<sup>nd</sup> Prof – (Generalised)**

### **Spiral I**

The 1<sup>st</sup> year & 2<sup>nd</sup> Year MBBS curriculum make this spiral. The subjects are Anatomy, Physiology, Biochemistry as main Basic Sciences, while all other basic Sciences Pathology, Pharmacology, Forensic Medicine, Community Medicine, Family Medicine, Behavioural Sciences, Clinical skills curriculum, Medicine & Allied, Surgery & Allied, Obs/Gyn, Paeds, ENT & Ophthalmology, Radiology and Laboratory are vertically integrated as per module and relevance to other subject matter.

The outcomes at the end of the Spiral I are as below;

**Broad Outcome:** *Students would have achieved the knowledge of basic human body structures, functions and clinical relevance of the same in medical profession. They would have skills relevant to research, laboratory workup related to subject matter of basic sciences part of the spiral's curriculum with an observatory element through integrated hospital placements and CSC sessions. They would have also attained knowledge of behaviours mandatory for doctors through CSC sessions, PRIME, BS, integrated hospital placements.*

### **Details of Intended Outcomes**

1. Describe the basic structures, functions and biochemistry of the systems as per prescribed curriculum of PMC and KMU for 1<sup>st</sup> & 2<sup>nd</sup> Professionals MBBS.
2. Explain the difficult concepts and theories involved in the function and biochemistry of the prescribed systems based curriculum for each academic year.
3. Relate the structure and function to the common pathologies associated with the body organs / systems.
4. Describe the pharmacokinetics & pharmacodynamics of pharmacological agents.
5. Comprehend the basics of primary healthcare in Pakistan.
6. Familiarize with the infrastructure, functioning and protocols of different sections of tertiary care hospital (OPD, Ward, OT, Lab, Radiology, Nursing etc).
7. Perform practical work in laboratories / museums as per prescribed curriculum while observing safety and hygiene protocols of basic science labs.
8. Perform basic clinical skills in clinical skill lab under supervision and demonstrate the desired competency as per prescribed curriculum.
9. Describe the common signs and symptoms of diseases common in Pakistani context relevant to the system / block-based modules.
10. Comprehend the basics of medical research in 1<sup>st</sup> year and develop a synopsis by the end of 2<sup>nd</sup> year.

11. Comprehend basics of behavioural science, leadership and management, communication skills and professionalism.
12. Develop knowledge of Family medicine and its concepts in national and international healthcare contexts.
13. Observe clinical facilitators during integrated modular hospital placements and develop understanding of doctor –patient relationship, history taking skills and basic examination by recording in provided logbooks / portfolios.

Show behaviours and attitudes as per prescribed objectives of PRIME, like professionalism, value and respect for self, colleagues, teachers and patients

### 1<sup>st</sup> & 2<sup>nd</sup> Prof Modules

S#	Module Name	Year
1	Foundation & Blood	1 <sup>st</sup> Prof MBBS
2	Muscular skeleton System-I	
3	Muscular skeleton System-II	
4	CVS	
5	Respiration	
6	Neuroscience-I	2 <sup>nd</sup> Prof MBBS
7	Neuroscience-II	
8	GIT	
9	Renal	
10	Endocrine	
11	Reproduction	

### Foundation & Blood Module Objectives

Knowledge

1. Familiarize with the MBBS system-based curriculum
2. Recognize the role of different disciplines in studying human body and its diseases.
3. Describe the structure, function and biochemical composition of cell.
4. Describe the cell division, its types and genetic material along with its clinical correlation.
5. Describe the basic organization of human body.
6. Explain the maintenance of homeostatic mechanism.
7. Describe the various stages of pre embryonic human development and correlate them with various malformations.
8. Describe the importance of buffer and PH system.
9. Describe various cellular adaptations during cell growth, differentiation and cell injury.

#### Blood Module Objectives

1. Identify & describe the various cellular and non-cellular components of blood in relation to its Anatomy, Physiology & Biochemistry
2. Describe structure, synthesis and degradation of Hemoglobin

3. Describe the regulatory mechanisms of normal hemostasis and coagulation
4. Describe the conditions associated with dysfunction of cellular and non-cellular components of blood
5. Describe the basic characteristics of immune system.
6. Discuss the structure, functions and biochemical aspects of the Lympho-reticular system.
7. Explain the principles and clinical significance of ABO/RH blood grouping system
8. Explain the pathophysiology of various bleeding disorders
9. Identify the role of pharmacology in anemia and bleeding disorders.

### **MSK-I – II Module Objectives**

#### Knowledge

1. Develop an understanding of the fundamental components of the musculoskeletal system.
2. Explain the structure & function of the musculoskeletal (MSK) components of limbs and back.
3. Describe how injury and disease alter the MSK structure & function.
4. Integrate concepts relating to various metabolic processes, their disorders and relevant lab investigations in the study of human MSK system.
5. Describe the role of the limbs (upper/lower) in musculoskeletal support, stability and movements.
6. Describe the development of the limbs & correlate it with organization and gross congenital anomalies of the limbs.
7. Identify the anatomical features of bones, muscles & neurovascular components of the limbs and correlate them with their functions, injuries and clinical problems.
8. Describe the types, formation, stability, function & clinical significance of joints of the upper and lower limb.
9. Describe the basic histology of muscle fibers including its molecular structure (Sarcomere).
10. Explain the mechanism of excitation and contraction of skeletal and smooth muscles.
11. Describe the basis for the use of therapeutic agents to modulate neuromuscular transmission.
12. Describe the general principles of MSK pain management.
13. Describe ergonomics and its principles. Prevention of different MSK disorders.
14. Interpret the mechanism of post-mortem rigidity. (spiral II)
15. Give an overview of pathology of bones, muscles and joints.
16. Explain the role of different minerals, hormones and specific metabolic products related to the musculoskeletal system and correlate them with their relevant clinical metabolic disorders.
17. Interpret the relevant laboratory investigations for diagnosis of common musculoskeletal disorders. (Spiral two)
18. To develop the critical thinking and analysis in the context of various case scenarios pertaining to locomotors system.

### **CVS Module Objectives**

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
16. Discuss normal ECG and common ECG abnormalities
17. Enlist the drugs used in ischemic heart disease and hyperlipidemias
18. Describe preventive strategies of cardiovascular diseases

### **Respiration Module Objectives**

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 the biochemical structure and functions of enzymes
14. Describe the mechanisms of O<sub>2</sub> and CO<sub>2</sub> transport in the blood
15. Classify anti-asthmatic and anti-tuberculous drugs
16. Describe the types and signs of asphyxia
17. Enlist the causes and signs of pneumonias, bronchial asthma, tuberculosis, Acute Respiratory Distress Syndrome (ARDS), and pulmonary edema
18. Describe the parameters of Pulmonary Function Tests (PFTs)

### **Neuroscience-I Objectives**

- 1) Explain the gross and microscopic structural and functional features of peripheral nerves, spinal cord and brain.
- 2) Describe the development of forebrain, midbrain and hindbrain
- 3) Describe the basic functions of synapses, neurotransmitters and mechanisms of electrical events during neuronal excitation
- 4) Explain the structure and functions of different receptors during neuronal excitation
- 5) Describe the mechanisms and pathways of sensory inputs in the nervous system

- 6) Explain the organization, structure, functions, and neurotransmitters of autonomic nervous system
- 7) Describe the blood supply and venous drainage of brain and spinal cord
- 8) Describe the organization, structure and functions of motor system of the brain and spinal cord
- 9) Explain the organization, structure and functions of cerebellum and basal ganglia
- 10) Explain the structure, formation and drainage of cerebrospinal fluid in the brain and spinal cord
- 11) Describe the functions of limbic system and reticular activating system
- 12) Describe the pathophysiology and prevention of common diseases like stroke, epilepsy, hydrocephalus and brain injuries
- 13) Identify the microscopic structure of spinal cord, cerebral and cerebellar cortex
- 14) Examine nervous system of a standardized patient (sensations, motor functions, and higher cortical functions and tendon reflexes)

### **Neuroscience-II Objectives**

- 1) Describe the structure of vertebrae, skull bones palate, pharynx, larynx, facial bones and base of the skull
- 2) Describe the contents walls and boundaries of anterior and posterior triangles of the neck
- 3) Describe the structure, relation, blood supply and venous drainage of thyroid
- 4) Describe the arteries, veins and nerves of the neck including cervical plexuses
- 5) Describe the nuclei, course, relations, and structures supplies by all cranial nerves
- 6) Describe the origin, course, relations and structures supplies by the arteries, veins and lymphatics of head and neck
- 7) Describe the anatomy of all the muscles of facial expression and head and neck
- 8) Describe the structure and functions of eye, ears, nose and paranasal sinuses
- 9) Describe the development of different structures of organs of the head and neck
- 10) Identify the microscopic structure of salivary glands and tongue
- 11) Examine a standardized patient`s cranial nerves
- 12) Demonstrate Perimetry and Audiometry

### **GIT Objective**

- 1) Describe the anatomy of oral cavity with respect to GI functions
- 2) Elaborate the structure and functions of salivary glands
- 3) Describe the structure and development of esophagus, stomach, small intestine and large intestine
- 4) Describe the anatomy of peritoneum and mesentery
- 5) Explain the movements, functions and regulations of gastrointestinal functions
- 6) Describe the structure, development and functions of hepatobiliary system and pancreas
- 7) Discuss the mechanisms of digestion and absorptions of carbohydrates, proteins, fats and other nutrients
- 8) Describe different physiological reflexes occurring upon stimulation of gastrointestinal organs
- 9) Discuss the chemistry and functions of gastrointestinal hormones
- 10) Describe common pathological conditions like peptic ulcers, viral hepatitis, obstructive jaundice, carcinoma of esophagus and colorectal cancers

- 11) Explain the metabolic processes related to carbohydrates, fats and protein metabolism
- 12) Describe the components of medical ethics
- 13) Explain research ethics, research misconduct and plagiarism
- 14) Explain the psychosocial aspects of common psychiatric and functional bowel disorders

### Endocrinology Objectives

- 1) Development, structure, hormones and regulation of pituitary gland, thyroid gland, parathyroid gland, endocrine pancreas, and adrenal glands
- 2) Describe the etiology, pathophysiology, relevant clinical features and common investigations of disorders of these glands
- 3) Describe the basic concepts and components of medical professionalism
- 4) Describe the steps of writing a research proposal

### Reproduction Objectives

1. Describe the development, structure and functions of bony pelvis, uterus, ovaries
2. and perineum
3. Describe the development, structure and functions of mammary glands
4. Explain the contents and mechanism of formation of milk
5. Describe the development, structure and functions of male genital organs
6. Explain the synthesis, mechanism of action, physiological effects and regulation of
7. sex hormones in males and females and hormones released from placenta
8. Describe the physiology of gestation and parturition
9. Describe basic statistical tests and their significance
10. Describe the concept of empathy as part of professionalism
11. Explain the steps of research evaluation, its validity and reliability

S#	Module Name	Year
1	Foundation-II	3 <sup>rd</sup> Prof MBBS
2	inflammation & Infection	
3	Multisystem	
4	Blood & Immunology	
5	MSK-II	
6	CVS-II	
7	Respiration	
8	Neuroscience-II	4 <sup>th</sup> Prof MBBS
9	GIT-II	
10	Endocrinology	
11	Renal	
12	Tertiary Patient Care	5 <sup>th</sup> Prof MBBS
13	Specialty Based Patient Care	
25	Generalized Based Patient Care	

## Spiral II (3<sup>rd</sup> Year & 4<sup>th</sup> Year MBBS)

### Broad Outcome

*Students would have achieved knowledge of diseases of different human body systems, their clinical presentations, prescription writing, research, professionalism & ethics, leadership and management, infection control, patient safety in healthcare profession. They would acquire skills of history taking and examination, and counselling relevant to all disciplines. They would display conduct and behaviours pre-requisite of doctors working in hospitals through hospital postings, CSC and community visits.*

### Details of Intended Outcomes

1. Describe basic and advanced concepts (absorption, distribution, metabolism, excretion, adherence, compliance, and concordance, drug reactions. legal & ethical aspects) of pharmacology & therapeutics.
2. Comprehend the importance of appropriate and rational prescription writing in healthcare provision.
3. Apply the learnt concepts of pharmacology & therapeutics to real life cases.
4. Compose reports or certificates in medico-legal cases/situations in accordance with the law of Pakistan.
5. Interpret autopsy findings and results of other relevant investigations to logically conclude about the cause, manner and time since death.
6. Apply medical ethics, etiquette, duties, rights, medical negligence and legal responsibilities of the physician toward patient, profession, society, state and humanity at large.
7. Apply relevant legal/ court procedures applicable to the medico-legal/ medical practice.
8. Collect preserve and dispatch specimens in medico-legal/ postmortem cases and other concerned materials to the appropriate Government agencies for necessary examination.
9. Diagnose, apply principles of therapy & understand medico-legal implications of common poisons.
10. Apply general principles of analytical, environmental, occupational and preventive aspects of toxicology.
11. Discuss relationships between pathology and basic sciences pathology and clinical sciences.
12. Discuss the effects of sample handling on laboratory results, including turnaround time, type of tube used for blood collection, timing of collection, transport, and storage.
13. Outline a classification of causes of disease, basic responses of the body to injury, and manifestations of disease; and classify common examples in each category.
14. Compare cell and tissue adaptation, reversible cell injury, and irreversible cell injury (cell death) on the basis of etiology, pathogenesis, and morphologic appearance (ultra-structural and histologic).
15. Relate pathological basis of disease to its clinical picture.
16. Counsel patients in different clinical settings through simulation in clinical skills.
17. Describe preventive, educational and promotional concepts in community health as per curriculum prescribed by PM&DC.

18. Develop research questionnaire.
19. Conduct field research.
20. Interpret and present data with publication of article.
21. Comprehend and perform basic life support skills.
22. Compose and present history of patients in different clinical disciplines in rotations.
23. Perform basic physical examination on Medical, surgical, Paediatric, Obstetric/Gynecological, ENT and Ophthalmology patients during hospital rotations.
24. Manage and submit their portfolios and logs in time to medical education.
25. Describe the basic concepts of system based disease mechanisms and processes.
26. Classify diseases of various body systems and their clinical and histopathological manifestations.
27. Devise probable diagnoses from clinical scenarios by recognition of congenital, hemodynamic, inflammatory, infectious, metabolic, environmental, and neoplastic diseases.
28. Apply pathological concepts in the diagnosis, staging, and management of disease.
29. Interpret pathological reports of real life cases to articulate differential diagnosis.
30. Appraise health status of a community to better understand the role of a general practitioner in the community.
31. Perform a community based research to understand the role of research in improving health status of communities.
32. Describe basic principles of epidemiology and biostatistics.
33. Describe major study designs in community based research.
34. Calculate sensitivity and specificity from a 2 X 2 table and application of statistical tests to data.
35. Conduct research by searching the medical literature, including electronic databases.
36. Locate and interpret up-to-date evidence to optimize patient care.
37. Relate the relevant concepts of clinical subject in relationship to pathological and community based topics as per integration of the same.
38. Value the protocol of interaction with patients by showing respect and discipline during clinical rotations.
39. Describe the basic concepts of clinical subjects as per prescribed curriculum by regulatory authorities.
40. Perform the skills relevant to clinical disciplines, such as, history taking, systemic examination, radiological and laboratory test interpretation.
41. Manage and submit their portfolios and logs in time to medical education.
42. Describe the basics and applied aspects of Otorhinolaryngology (ENT) and Ophthalmology.
43. Compose elaborate & focused history in ENT and ophthalmology.
44. Perform examination of ear, nose and throat under supervision and independently.
45. Perform examination of eye.
46. Compose a management plan for basic problem sin ENT and Ophthalmology.
47. Devise a prescription plan for common ENT and Eye related problems in Pakistani community.

### 3<sup>rd</sup> Prof MBBS

#### **M-1 Foundation 2 Module objectives**

- 1) Define pathology, its different branches and enumerate clinically important bacteria.
- 2) Describe the structure of bacterial cell and mechanisms by which they cause the disease.
- 3) Describe methods used to identify different microbes in laboratory and explain the interventions employed to prevent infections including vaccines.
- 4) Describe cell injury, its different mechanisms and sub cellular responses to cell injury.
- 5) Describe necrosis, apoptosis and adaptive changes seen in clinical settings and its identification in surgical specimens.
- 6) Define common terms related to Pharmacology.
- 7) Describe the basic principles of pharmacokinetics and pharmacodynamics and apply these principles to clinical practice as they relate to drug absorption, distribution, metabolism, excretion, mechanism of action, clinical action and toxicity.
- 8) Describe the cellular and biochemical sites where drugs bind to act.
- 9) Describe the general principles of drug interactions in relation to clinical practice.
- 10) Describe the process of new drug development.
- 11) Identify different dosage forms of drugs.
- 12) Demonstrate searching accurate information quickly in a formulary.
- 13) Demonstrate administration of a drug through intramuscular and intravenous routes.
- 14) Write down the basic format of drug prescription and describe the general principles of prescribing drugs.
- 15) Write correctly medical abbreviations used in clinical practice.
- 16) Identify commonly used equipments in Pharmacy.
- 17) Describe Forensic medicine, its different branches and importance.
- 18) Describe law and its various components.
- 19) Describe autopsy, its protocols and related hazards.
- 20) Describe different refractive errors and its management.
- 21) Explain causes of watery eyes in both infants and elders and its management.
- 22) Describe the basic concept of health, disease and primary health care.
- 23) Demonstrate different pathological laboratory procedures and identify gross and microscopic features in the given specimens.
- 24) Demonstrate professionalism, respect, honesty and compassion by behaving in a courteous manner with colleagues and teachers during course activities like long lectures, SGDs and Practicals.
- 25) Describe the PMDC code of Ethics
- 26) Describe the steps of process of developing a research protocol

- 27) Perform interviewing and physical examination on simulations and patients.
- 28) Demonstrate administration of a drug through intramuscular, intravenous and subcutaneous routes on manikins

### **M-2 Infection & Inflammation Module**

- 1) Describe the process of acute & chronic inflammation with their outcomes
- 2) Relate different aspects of healing and repair
- 3) Differentiate common pathogenic bacteria based on morphology, pathogenesis & lab diagnosis.
- 4) Relate bacterial pathogenic factors to clinical manifestations of common infectious diseases.
- 5) Describe the pharmacological details of anti-inflammatory drugs
- 6) Apply/relate the pharmacokinetics & pharmacodynamics of chemotherapeutic agents to their use in infectious diseases
- 7) Construct/write prescriptions for various infectious diseases
- 8) Describe medico legal aspects of HIV patient
- 9) Describe mechanism of wound causation
- 10) Describe medico legal aspects of poisoning in general
- 11) Describe medico legal aspects of parameters used for personal identification in real life situation
- 12) Apply parameters of a person's identification in a simulated environment
- 13) Explain the incidence, prevalence and determinants of common infectious diseases.
- 14) Discuss the preventive and control measures for infectious diseases.
- 15) Perform interviewing and physical examination on simulations and patients.

### **M-3 Multisystem Module objectives**

- 13 Explain the functional organization of Autonomic Nervous system (ANS)
- 14 Describe the basic and clinical pharmacology of drugs acting on the ANS
- 15 Describe anticancer drugs
- 16 Describe the basic and clinical pharmacology of Eicosanoids.
- 17 Describe the basic and clinical pharmacology of drugs used for common skin
- 18 Describe the clinical uses of some popular herbal medications.
- 19 Describe single Gene Disorders, cytogenetic disorders and different mutations
- 20 Describe the molecular Genetics Diagnosis
- 21 Define neoplasia and nomenclature of tumors
- 22 Describe characteristics of benign and malignant tumors
- 23 Describe epidemiology of cancer
- 24 Describe carcinogens, their types and clinical aspects of neoplasia

- 25 Describe diagnosis of cancer, grading and staging of tumors Describe pathways for tumor spread and tumor immunity
- 26 Describe the protocols and procedures of autopsy.
- 27 Describe Thanatology and its medicolegal implications.
- 28 Describe general principles of Toxicology and their role in medicolegal sciences.
- 29 Describe the fundamentals of Research Ethics

#### **M-4 Blood & Immunology Module Objectives**

1. Describe the pathophysiology and diagnosis of different types of anemia.
2. Explain the pathogenesis of different hematological malignancies.
3. Discuss the diagnostic approach to malignant hematological disorders.
4. Discuss the pathophysiology and diagnosis of bleeding disorders.
5. Explain the immune system of the body and its components.]
6. Describe the mechanism of defense from infection.
7. Explain hypersensitivity and allergy.
8. Discuss the rationale for immunomodulation and its impact on improving the therapeutic dynamics of autoimmune Disorders and malignancies.
9. Describe the drugs for treating various types of anemia.
10. Write prescription for the prevention and treatment of iron-deficiency anemia.
11. Describe the application of blood groups in Forensic work
12. Describe the examination of blood stains
13. Describe the medico legal importance of blood as trace evidence
14. Describe the EPI schedule of Pakistan and the basic principles of Immunization.
15. Describe the most prevalent anemia's that affect the population of Pakistan, and the risk factors for vulnerable population.
16. Describe the most prevalent blood borne infections that affect the population of Pakistan, and the appropriate preventive Strategies including safe blood practice.

#### **M-5 MSK II Module Objectives**

Knowledge

Reinforcement

- Explain important anatomical and physiological characteristics of musculoskeletal system

**Pathology**

- Explain essential pathological concepts of diseases involving
  - Joints
  - Bones
  - Muscles

- Cartilages
- Soft tissues
- Skin

### **Pharmacology**

- Describe the clinical applications of NSAIDs in the treatment of musculoskeletal disorders
- Describe the basic and clinical pharmacology of drugs affecting bone and Mineral Homeostasis
- Describe the basic and clinical pharmacology of drugs used to treat Gout and Rheumatoid Arthritis
- Describe the basic and clinical pharmacology of skeletal muscles relaxants
- Describe the drugs used for dermatological disorders.

### **Community medicine**

- Classify accidents and injuries, burden of RTAs, prevention and control strategies of RTAs
- Define poliomyelitis and discuss the epidemiology, prevention, and control of poliomyelitis
- Define Ergonomics, Principles of Ergonomics, Epidemiology of MSK disorders and their prevention
- Discuss burden and prevention of Osteoporosis, Osteomalacia and Rickets

### **Forensic medicine**

- Define and classify wounds
- Describe types of hurt according to Qisas and Diyat Act
- Describe firearm and explosives injuries
- Describe RTAs, Railway and Aircraft injuries
- Describe the Medico legal aspects of wounds

### **Medicine**

- Describe Osteoporosis and Osteomalacia and develop its management plan
- Discuss Rheumatoid Arthritis and Ankylosing Spondylitis
- Discuss Myopathies

### **Orthopedic**

- Describe types of fracture and explain the open fractures
- Explain the emergency treatment of an injured limb.
- Identify and describe common benign and malignant bone tumours.
- Describe common ligamentous, tendon injuries and common spinal fractures

### **Dermatology**

- Describe the pathological lesions of skin and their clinical presentation with differential Diagnosis.

### **Radiology**

- Interpret normal X-Rays and X-Rays showing structural deformities

### **Paeds**

- Explain bone pains and aches in children
- Discuss Congenital/Hereditary Myopathies

## **Eye**

- Describe the basic Anatomy of Eye

## **ENT**

- Discuss anatomy of Ear, Nose, Para nasal Sinuses and Oral Cavity

## **Prime:**

Communication Skills

- Dealing with patients

## **Behavioral Sciences / Professionalism**

- Attributes of Professionalism

## **Research**

- Study Designs
- Research question

## **Skills:**

### **Special Pathology**

- Identify morphological features of Basal cell carcinoma and Squamous cell carcinoma
- Identify morphological features of Tuberculous osteomyelitis

### **Pharmacology**

- Writing a prescription for a patient with Rheumatoid arthritis
- Writing a prescription for a patient with Gout

### **Forensic Medicine**

- Identify types of mechanical wound
- Identify the causative weapon
- Identify the manner of wound causation
- Issue a medico legal certificate for the given wound

### **Orthopedic/Medicine**

- Acquire a thorough history in relevance to MSK and take focused general examination of

### **Musculoskeletal system.**

- Identify, evaluate and interpret the X-ray to diagnose fractures/musculoskeletal conditions
- Discuss the radiological characteristics of fractures and radiological characteristics of Dislocations

## **Attitude:**

- While not necessarily taught explicitly, students are expected to develop following attitudes
- throughout the course:
  - Demonstrate teamwork, leadership, punctuality and good manners
  - Demonstrate humbleness and use socially acceptable language during academic and social
- Interactions with colleagues and teachers.
  - Make ethically competent decisions when confronted with an ethical, social or moral
- problem related to MSK in professional or personal life

- Discuss ethical issues, social and preventive aspect of health care in the context of MSK system.

### **M-7 Respiratory Module Objectives**

- 1) Explain various lower respiratory tract infections
- 2) Explain obstructive respiratory diseases.
- 3) Describe various Granulomatous lung diseases
- 4) Describe basic and clinical Pharmacology of the drugs affecting respiratory system.
- 5) Prescribe medication according to standard guidelines for common respiratory disorders.
- 6) Describe medico legal aspect of asphyxial death.
- 7) Describe respiratory tract diseases of public health importance with emphasis on their epidemiology and prevention.
- 8) Describe management of common respiratory problems.

## **4<sup>th</sup> Prof MBBS**

### **General learning outcomes**

At the end of this module, the year 4 students will be able to:

- 1) Describe anxiety disorders and their pharmacological management
- 2) Explain the concepts of Mood disorders and their pharmacological management
- 3) Explain psychotic disorders and their pharmacological management
- 4) Describe the pathophysiology and management of Dementias
- 5) Elaborate the pathophysiology, clinical features, management, and prevention of cerebrovascular diseases
- 6) Classify epilepsy and describe the pharmacological management of epilepsy in children and adults
- 7) Describe the types and protocols of anaesthesia and explain the drugs used as anaesthetics
- 8) Explain the pathology and clinical features of cerebellar diseases
- 9) Elaborate the clinical features and pharmacological management of Parkinson`s disease
- 10) Explain the clinical features and management of Motor neuron disease and Friedrich`s ataxia
- 11) Describe the pathology and management of head injury
- 12) Describe the pathogenesis, clinical features, and management of common CNS infections
- 13) Classify brain, spinal cord and peripheral nerves tumors, and describe their clinical features and management
- 14) Explain the pathophysiology, clinical features, investigations and management of Multiple sclerosis, transverse myelitis and Guillain Barre syndrome

- 15) Classify peripheral neuropathies and elaborate their etiologies and clinical presentations
- 16) Explain the clinical features and forensic approach to a patient with neurotoxic poisons.
- 17) Explain the forensic aspects of insanity and head injury.
- 18) Describe the pathology, clinical features, investigations and treatment of Hyper and hypopituitarism
- 19) Describe the pathology, clinical features, investigations and treatment of Hyper and hypothyroidism, and hyper and hypoparathyroidism
- 20) Describe the classification, pathogenesis, clinical features, investigations and treatment of Diabetes mellitus
- 21) Explain the pathology, clinical features, investigations and treatment of Hyper and hypoadrenalism
- 22) Explain the causes of male and female infertility and its management
- 23) Explain the classification, pathology and management of testicular tumors
- 24) Explain benign and malignant breast disease
- 25) Discuss the etiology, risk factors, clinical features, investigations and treatment of carcinoma of breast
- 26) Describe the pharmacokinetics and pharmacodynamics of pituitary, gonadal, pancreatic, thyroid and adrenocortical hormones, their synthetic analogues and antagonists, and their role in the management of relevant disease conditions
- 27) Formulate prescriptions for patients with Graves' disease and Diabetes mellitus
- 28) Discuss the laws related to sexual offenses, and management of a rape victim in forensic aspects
- 29) Explain the pathophysiology and surgical management of benign prostatic hyperplasia and carcinoma of the prostate
- 30) Describe the anatomy and physiology of Ear, Nose, Throat & Neck.
- 31) Obtain appropriate history, examine Ear, Nose, oral cavity, pharynx, larynx and Neck including mirror examinations and functional examinations of these areas.
- 32) Describe benign and malignant tumors involving the ENT and Head & Neck.
- 33) Assist in diagnostic procedures and take swab for culture and sensitivity from ear, Nose & throat under supervision.
- 34) Prescribe hematological investigations, x-ray paranasal sinuses, CT/MRI scan of paranasal sinuses, temporal bone and Head & Neck & interpret it.
- 35) Perform clinical tests of hearing, tuning fork tests and balance independently and Interpret pure tone audiogram & tympanogram.
- 36) Describe the ABC protocol for resuscitation of traumatic patients.
- 37) Discuss differential diagnosis of membrane on the tonsils and describe diphtheria.
- 38) Describe sialadenitis, sialolithiasis and enumerate the benign and malignant salivary tumors.
- 39) Discuss a treatment plan for the patients with various common diseases of the ENT and Head and Neck region.
- 40) Describe dysphagia and its causes, Plummer-Vinson Syndrome and malignant tumors of hypopharynx that could lead to dysphagia and hoarseness along with their management.

- 41) Describe the management of corrosive ingestion and foreign body in the esophagus.
- 42) Describe various congenital and acquired disorders of the ENT and Head & Neck region.
- 43) Describe the significance of hoarseness and stridor & enumerate their causes and clinical features of respiratory obstruction.
- 44) Differentiate clinically between various types of stridor and possible site of obstruction.
- 45) Describe tracheostomy and indications for this procedure.
- 46) Describe squamous cell carcinoma of the larynx and the impact of stage of disease on management and survival of patient.
- 47) Explain the mutual association of hearing and balance disorders & the various conditions that give rise to these disorders.
- 48) Describe the clinical features and course of otosclerosis, Meniere's disease, vestibular neuronitis & BPPV.
- 49) Diagnose suppurative otitis media & describe its intracranial and extra cranial complications.
- 50) Describe the 'rehabilitation of deaf and mute child' and the impact of hearing impairment in children.
- 51) Describe rhino-sinusitis, its various types of rhino-sinusitis and its complications.
- 52) Describe the diseases of the nasal septum & define DNS and enumerate its various types.
- 53) Describe the pathophysiology, types and management of Sino nasal polyposis.
- 54) Enumerate various conditions resulting in nasal obstruction & discharge.
- 55) Describe various types of allergic & non-allergic rhino-sinusitis.
- 56) Enumerate fungal and other granulomatous diseases of the nose & paranasal sinuses and describe their management.
- 57) Categorize various conditions benign & malignant neoplasms of the nose & paranasal sinuses.
- 58) Classify various types of neck swellings and describe clinical differentiating features of benign & malignant neck masses.
- 59) Describe a classification of various lymph nodes levels in the neck and describe the lymphatic drainage of the head and neck.
- 60) Obtain informed consent from patient and communicate with the patients, their families and community regarding diseases & its relevant issues.
- 61) Describe the anatomy and physiology of salivary glands
- 62) Describe benign & malignant diseases of the salivary glands
- 63) Describe the visual standards.
- 64) Define and classify blindness.
- 65) Describe the anatomy and physiology of visual pathway and different visual field defects.
- 66) Describe the basics and usage of optical coherence tomography (OCT), visual fields and ultrasonography in common eye disorders.
- 67) Differentiate different types of lid bumps and propose a management plan for it.

- 68) Discuss ptosis, ectropion and entropion and describe the treatment options.
- 69) Examine bulgy eyes and investigate different causes of it.
- 70) Describe the differential diagnosis of red eye.
- 71) Explain the pathophysiology, and management of different conjunctival inflammations.
- 72) Explain the pathophysiology, and management of different corneal inflammations.
- 73) Discuss the pathophysiology, and management of uveal inflammations.
- 74) Describe the aqueous humor dynamics and its role in glaucoma.
- 75) Enumerate different causes of gradual visual loss and propose their management plan.
- 76) Enumerate different causes of sudden visual loss (painful/painless) and propose their management plan.
- 77) Describe squint, its presentation and principles of management.
- 78) Enumerate different causes of double vision and propose their management plan.
- 79) Enumerate different causes of childhood blindness and propose their management plan.
- 80) Discuss the clinical importance of white pupil in children.
- 81) Define amblyopia, describe its causes and management.
- 82) Differentiate between different terms used in ocular trauma.
- 83) Propose the management plan of ocular injuries.
- 84) Describe the etiology, pathogenesis, morphology, clinical features, laboratory diagnosis, medical and surgical management of diseases of GIT & hepatobiliary system.
- 85) Interpret the liver function tests in different hepatic diseases.
- 86) Describe the basic and clinical pharmacology of drugs used in GIT & hepatobiliary diseases.
- 87) Write prescriptions for common GIT & hepatobiliary disorders.
- 88) Describe medico legal aspects of abdominal trauma.
- 89) Describe medico legal aspects of vegetable acid, corrosive and irritants poisoning
- 90) Describe the epidemiology and prevention of malnutrition and viral hepatitis.
- 91) Analyze demographic processes in context of public health care.
- 92) Describe applied anatomy of Urinary System with video demonstration
- 93) Discuss briefly physiology of the renal system
- 94) Revisit/Describe briefly the different Acid-base Disorders and the Mechanism for maintaining Acid-base Balance (Biochemistry)
- 95) Classify the diseases involving glomeruli, tubules, interstitium, renal blood vessels, Chronic nephron loss, Cystic, urine out flow obstruction, congenital-developmental and neoplastic diseases of renal system
- 96) Describe the etiology, pathogenesis, clinical manifestations, diagnosis and prognosis of the renal system diseases.
- 97) Perform various practicals used in laboratory diagnosis of renal diseases.
- 98) Describe the Pharmacology of drugs used in the treatment of Renal System Diseases
- 99) Describe ethics of Organ Transplantation
- 100) Describe prevalence of renal diseases
- 101) Describe the clinical features of renal diseases.

- 102) Diagnose & manage Acute & Chronic Kidney Disease, Nephrotic, Nephritic Syndromes, Urinary Tract Infections
- 103) Management of Urinary Tract Infections, Chronic Kidney Diseases & Renal Transplant patients during Pregnancy
- 104) Enumerate/Describe various renal diseases primarily effecting pediatrics age group
- 105) Describe pathogenesis and management of renal stones
- 106) Describe pathogenesis and management of bladder outlet obstruction (BOO)

### **Spiral III (5<sup>th</sup> Professional)**

#### **Outcomes**

The Graduate learning outcomes (GLOs RMC given above on pages 1-6 ). Some specific objectives are mentioned below.

#### **Details of Intended Outcomes**

##### **Knowledge Based**

By the time of graduation, the student shall be able to;

1. Explain the basics of medical, surgical, paediatric and, obstetric & gynecological diseases and relevant clinical presentations as per prescribed curriculum.
2. Differentiate between the basic clinical signs and symptoms relevant to individual contexts of the disciplines as per regulatory body guidelines.
3. Explain the principles of examinations, general & systemic, as per prescribed curriculum.
4. Interpret laboratory & radiological reports and compose differential diagnosis.
5. Assess patients in different discipline based placements, and formulate a management plan.
6. Differentiate between routine and emergency cases and understand the protocol for management.
7. Relate the presentation of cases to underlying pathological problems and arrive upon a diagnosis.
8. Exhibit critical thinking and clinical reasoning via differential diagnosis.
9. Construct and carry out a clinical based research project by the end of 5<sup>th</sup> prof.
10. Relate signs and symptoms to underlying disease and identify the best pharmacological agents for prescription writing.

##### **Skill based**

1. Perform systemic examination in varying contexts of major clinical and allied disciplines.
2. Demonstrate respect for patient confidentiality, autonomy and preferences.
3. Demonstrate competence in performing skills as per prescribed competencies by regulatory authorities and relevant to the disciplines.

4. Demonstrate competence in developing a management plan for diseases at the level of general practitioner.
5. Demonstrate competence in relating laboratory and radiological tests to disease diagnosis.
6. Demonstrate coherence of knowledge and skill in management of patient.
7. Execute management plans with precision according to instruction under supervision.
8. Perform procedures as per prescribed curriculum, and highlighted in graduate learning outcome, in ward and in clinical skills center.
9. Manage basic life threatening emergencies, MI, Hypertension, Asthma etc in A&E.
10. Interpret changes related to major cardiac diseases in ECG.
11. Demonstrate leadership and management skills and take ownership of learning.
12. Demonstrate good communication and interpersonal skills.
13. Demonstrate counselling skills for variety of patients in medical field.

**Affect based**

By the end of 5<sup>th</sup> Prof the student shall be able to;

1. Acknowledge the concept of equity and equality in healthcare.
2. Conform to the prescribed guidelines and protocols mandatory for health professionals.
3. Respect the confidentiality, autonomy and personal preferences in treatment of patients.
4. Respect ethnic & cultural diversity in healthcare provision and understands the individual requirements.
5. Show professionalism and abide by ethical and legal norms of the country.
6. Question own practices and modify accordingly.
7. Display discipline in personal, professional and social interactions.
8. Reflects on practice and display effects of experience on practice through reflective writing.
9. Display enthusiasm in enacting the lifelong processes mandatory for medical professionals.