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**राष्ट्रीय आयुर्विज्ञान आयोग**  
**National Medical Commission**  
**(Undergraduate Medical Education Board)**

**No.U.14021-8-2023-UGMEB/**

**Dated the 12<sup>th</sup> June 2023**

**CIRCULAR**

**Subject : Guidelines under Graduate Medical Education Regulation 2023**

Consequent upon publication of Graduate Medical Education Regulations 2023 in Gazette of India vide Notification dated 2<sup>nd</sup> June 2023 and in suppression of Graduate Medical Education Regulations 1997(as amended), Under Graduate Medical Education Board(UGMEB) hereby issues following new Guidelines for the MBBS Course :

- (i) CBME Curriculum
  - (ii) Manpower Requirement for Research Facilities in a Medical College.
  - (iii) Family Adoption Program
  - (iv) Admission of students under "Disability Category" in MBBS Course.
  - (v) Format for submission of information regarding admission of in a medical college
2. All previously issued Notifications/circulars/clarifications shall now be void and superseded by these new guidelines.
  3. These new guidelines shall be applicable to all the admission made in MBBS Course in a medical college in the academic year 2023-24.
  4. This issues with the approval of the competent authority in UGMEB, National Medical Commission.

  
12/6/2023  
(Shambhu Sharan Kumar)  
Director, UGMEB

## **CBME CURRICULUM**

### **1. Preamble**

The new Graduate Medical Education Regulations attempts to stand on the shoulder of the contributions and the efforts of resource persons, teachers and students (past and present). It intends to take the learner to provide health care to the evolving needs of the nation and the world.

About 25 years have passed since the existing Regulations on Graduate Medical Education, 1997 were notified, necessitating a relook at all aspects of the various components in the existing regulations and adapt them to the changing demography, socio-economic context, perceptions, values, advancements in medical education and expectations of stakeholders. Emerging health care issues particularly in the context of emerging diseases, impact of advances in science and technology and shorter distances on diseases and their management also need consideration. The strong and forward-looking fundamentals enshrined in the Regulations on Graduate Medical Education, 1997 has made this job easier. A comparison between the 1997 Regulations and proposed Graduate Medical Education Regulations, 2019 will reveal that the 2019 Regulations have evolved from several key principles enshrined in the 1997 Regulations.

The thrust in the new regulations is continuation and evolution of thought in medical education making it more learner-centric, patient-centric, gender- sensitive, outcome -oriented and environment appropriate. The result is an outcome driven curriculum which conforms to global trends. Emphasis is made on alignment and integration of subjects both horizontally and vertically while respecting the strengths and necessity of subject-based instruction and assessment. This has necessitated a deviation from using “broad competencies”; instead, the reports have written end of phase subject (sub) competencies. These “sub-competencies” can be mapped to the global competencies in the Graduate Medical Education Regulations.

The importance of ethical values, responsiveness to the needs of the patient and acquisition of communication skills is underscored by providing dedicated curriculum time in the form of a longitudinal program based on Attitude, Ethics and Communication (AETCOM) competencies. Great emphasis has been placed on collaborative and inter-disciplinary teamwork, professionalism, altruism and respect in professional relationships with due sensitivity to differences in thought, social and economic position and gender.

### **2. Objectives of the Indian Graduate Medical Training Programme**

The undergraduate medical education program is designed with a goal to create an “Indian Medical Graduate” (IMG) possessing requisite knowledge, skills, attitudes, values and responsiveness, so that she or he may function appropriately and effectively as a Physician of first contact of the community while being globally relevant. To achieve this, the following national and institutional goals for the learner of the Indian Medical Graduate training program are hereby prescribed.





### 3. National Goals

At the end of undergraduate program, the Indian Medical Graduate should be able to:

- a. Recognize "health for all" as a national goal and health right of all citizens and by undergoing training for medical profession fulfill his social obligations towards realization of this goal.
- b. Learn key aspects of National policies on health and devote himself to its practical implementation.
- c. Achieve competence in practice of holistic medicine, encompassing promotive, preventive, curative and rehabilitative aspects of common diseases.
- d. Develop scientific temper, acquire educational experience for proficiency in profession and promote healthy living.
- e. Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

### 4. Institutional Goals

In consonance with the national goals, each medical institution should evolve institutional goals to define the kind of trained manpower (or professionals) they intend to produce. The Indian Medical Graduates coming out of a medical institute should:

- a. Be competent in diagnosis and management of common health problems of the individual and the community, commensurate with his/her position as a member of the health team at the primary, secondary or tertiary levels, using his/her clinical skills based on history, physical examination and relevant investigations.
- b. Be competent to practice preventive, promotive, curative, palliative and rehabilitative medicine in respect to the commonly encountered health problems.
- c. Appreciate rationale for different therapeutic modalities; be familiar with the administration of the "essential drugs" and their common side effects.
- d. Appreciate the socio-psychological, cultural, economic and environmental factors affecting health and develop humane attitude towards the patients in discharging one's professional responsibilities.
- e. Possess the attitude for continued self-learning and to seek further expertise or to pursue research in any chosen area of medicine, action research and documentation skills.



- f. Be familiar with the basic factors which are essential for the implementation of the National Health Programs including practical aspects of the following:
- i) Family Welfare and Maternal and Child Health (MCH);
  - ii) Sanitation and water supply;
  - iii) Prevention and control of communicable and non-communicable diseases;
  - iv) Immunization;
  - v) Health Education and advocacy;
  - vi) Indian Public Health Standards (IPHS) at various level of service delivery;
  - vii) Bio-medical waste disposal
  - viii) Organizational and or institutional arrangements.
- g. Acquire basic management skills in the area of human resources, materials and resource management related to health care delivery, general and hospital management, principal inventory skills and counseling.
- h. Be able to identify community health problems and learn to work to resolve these by designing, instituting corrective steps and evaluating outcome of such measures with maximum community participation.
- i. Be able to work as a leading partner in health care teams and acquire proficiency in communication skills.
- j. Be competent to work in a variety of health care settings.
- k. Have personal characteristics and attitudes required for professional life including personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

## 5. Goals for the Learner

In order to fulfill these goals, the Indian Medical Graduate must be able to function in the following roles appropriately and effectively:-

- a. Clinician who understands and provides preventive, promotive, curative, palliative and holistic care with compassion.
- b. Leader and member of the health care team and system with capabilities to collect, analyze, synthesize and communicate health data appropriately.
- c. Communicator with patients, families, colleagues and community.





- d. Lifelong learner committed to continuous improvement of skills and knowledge.
- e. Professional, who is committed to excellence, is ethical, responsive and accountable to patients, community and profession.
- f. Critical thinker who demonstrates problem solving skills in professional practice
- g. Researcher who generates and interprets evidence

## **6. Competency Based Training Programme of the Indian Medical Graduate**

Competency based learning would include designing and implementing medical education curriculum that focuses on the desired and observable ability in real life situations. In order to effectively fulfill the roles, the Indian Medical Graduate would have obtained the following set of competencies at the time of graduation:

### **Clinician, who understands and provides preventive, promotive, curative, palliative and holistic care with compassion**

- Demonstrate knowledge of normal human structure, function and development from a molecular, cellular, biologic, clinical, behavioral and social perspective.
- Demonstrate knowledge of abnormal human structure, function and development from a molecular, cellular, biological, clinical, behavioral and social perspective.
- Demonstrate knowledge of medico-legal, societal, ethical and humanitarian principles that influence healthcare.
- Demonstrate knowledge of national and regional health care policies including the National Health Mission that incorporates National Rural Health Mission (NRHM) and National Urban Health Mission (NUHM), frameworks, economics and systems that influence health promotion, health care delivery, disease prevention, effectiveness, responsiveness, quality and patient safety.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to elicit and record from the patient, and other relevant sources including relatives and caregivers, a history that is contextual to gender, age, vulnerability, social and economic status, patient preferences, beliefs and values.
- Demonstrate ability to perform a physical examination that is complete and relevant to disease identification, disease prevention and health promotion.
- Demonstrate ability to perform a physical examination that is contextual to gender, social and economic status, patient preferences and values.
- Demonstrate effective clinical problem solving, judgment and ability to interpret and integrate available data in order to address patient problems, generate differential diagnoses and develop individualized management plans that include preventive, promotive and therapeutic goals.
- Maintain accurate, clear and appropriate record of the patient in conformation with

legal and administrative frameworks.

- Demonstrate ability to choose the appropriate diagnostic tests and interpret these tests based on scientific validity, cost effectiveness and clinical context.
- Demonstrate ability to prescribe and safely administer appropriate therapies including nutritional interventions, pharmacotherapy and interventions based on the principles of rational drug therapy, scientific validity, evidence and cost that conform to established national and regional health programmers and policies for the following:
  - Disease prevention,
  - Health promotion and cure,
  - Pain and distress alleviation, and
  - Rehabilitation and palliation.
- Demonstrate ability to provide a continuum of care at the primary (including home care) and/or secondary level that addresses chronicity, mental and physical disability.
- Demonstrate ability to appropriately identify and refer patients who may require specialized or advanced tertiary care.
- Demonstrate familiarity with basic, clinical and translational research as it applies to the care of the patient.

#### **Leader and member of the health care team and system**

- Work effectively and appropriately with colleagues in an inter-professional health care team respecting diversity of roles, responsibilities and competencies of other professionals.
- Recognize and function effectively, responsibly and appropriately as a health care team leader in primary and secondary health care settings.
- Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the health care delivery potential of the team.
- Access and utilize components of the health care system and health delivery in a manner that is appropriate, cost effective, fair and in compliance with the national health care priorities and policies, as well as be able to collect, analyze and utilize health data.
- Participate appropriately and effectively in measures that will advance quality of health care and patient safety within the health care system.
- Recognize and advocate health promotion, disease prevention and health care quality improvement through prevention and early recognition: in a) life style diseases and b) cancer, in collaboration with other members of the health care team.

#### **Communicator with patients, families, colleagues and community**

- Demonstrate ability to communicate adequately, sensitively, effectively and respectfully with patients in a language that the patient understands and in a manner that will improve patient satisfaction and health care outcomes.
- Demonstrate ability to establish professional relationships with patients and families that are positive, understanding, humane, ethical, empathetic, and trustworthy.





- Demonstrate ability to communicate with patients in a manner respectful of patient's preferences, values, prior experience, beliefs, confidentiality and privacy.
- Demonstrate ability to communicate with patients, colleagues and families in a manner that encourages participation and shared decision- making.

**7. Lifelong learner committed to continuous improvement of skills and knowledge**

- Demonstrate ability to perform an objective self-assessment of knowledge and skills, continue learning, refine existing skills and acquire new skills.
- Demonstrate ability to apply newly gained knowledge or skills to the care of the patient.
- Demonstrate ability to introspect and utilize experiences, to enhance personal and professional growth and learning.
- Demonstrate ability to search (including through electronic means), and critically re-evaluate the medical literature and apply the information in the care of the patient.
- Be able to identify and select an appropriate career pathway that is professionally rewarding and personally fulfilling.

**Professional who is committed to excellence, is ethical, responsive and accountable to patients, community and the profession**

- Practice selflessness, integrity, responsibility, accountability and respect.
- Respect and maintain professional boundaries between patients, colleagues and society.
- Demonstrate ability to recognize and manage ethical and professional conflicts.
- Abide by prescribed ethical and legal codes of conduct and practice.
- Demonstrate a commitment to the growth of the medical profession as a whole.

**A. CURRICULUM**

➤ **1<sup>st</sup> Professional Year:**

**1. ANATOMY**

**a. Competencies:**

The undergraduate must demonstrate:

- Understanding of the gross and microscopic structure and development of human body,
- Comprehension of the normal regulation and integration of the functions of the organs and systems on basis of the structure and genetic pattern,
- Understanding of the clinical correlation of the organs and structures involved and interpret the anatomical basis of the disease presentations.



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**b. Broad subject specific objectives**

**Knowledge:** At the end of the course the student should be able to

- Comprehend the normal disposition, clinically relevant interrelationships, functional and cross -sectional Anatomy of the various organs and structures of the body.
- Identify the microscopic structure and correlate elementary ultra structure of various organs and tissues with the functions as a prerequisite for understanding the altered state in various disease processes.
- Comprehend the basic structure and connections of the central nervous system to analyze the integrative and regulative functions of the organs and systems. He should be able to locate the site of gross lesions according to the deficits encountered
- Demonstrate knowledge of the basic principles and sequential development of the organs and systems; recognize the critical stages of development and the effects of common teratogens, genetic mutations and environmental hazards. He should be able to explain the developmental basis of the major variations and abnormalities.

**c. Skills:**

At the end of the course the student should be able to --

- Identify and locate all the structures of the body and mark the topography of the Living Anatomy.
- Understand clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture and kidney biopsy etc.
- Identify the organs and tissues under the microscope.
- Understand the principles of karyotyping and identify the gross congenital anomalies.
- Understand principles of newer imaging techniques and interpretation of CT scan, sonogram, MRI & Angiography.

- d. Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems with clinical correlation that will provide a context for the learner to understand the relationship between structure and function and interpret the anatomical basis of various clinical conditions and procedures.

## **2. PHYSIOLOGY**

**a. Competencies:** The undergraduates must demonstrate:

- Understanding of the normal functioning of the organs and organ systems of the body,
- Comprehension of the normal structure and organization of the organs and systems on basis of the functions,
- Understanding of age-related physiological changes in the organ functions that reflect normal growth and development,

- Understand the physiological basis of diseases.

**b. Broad subject specific objectives**

**Knowledge :** At the end of the course, the student will be able to:

- Describe the normal functions of all the systems, the regulatory mechanisms and interactions of the various systems for well coordinated total body functions.
- Understanding the relative contribution of each organ system in the maintenance of the milieu interior (homeostasis)
- Explain the physiological aspects of the normal growth and development.
- Analyze the physiological responses and adaptation to environmental stress. Comprehend the physiological principles underlying pathogenesis and treatment of disease.
- Correlate knowledge of physiology of human reproductive system in relation to National Family welfare program.

**c. Skills :** At the end of the course the student shall be able to:

- Conduct experiments designed for study of physiological phenomenon.
- Interpret experimental /investigative data.
- Distinguish between normal and abnormal data derived as a result of clinical examination and tests, which he has performed and observed in the laboratory.
- Recognize and get familiar with newer computerized and advanced instruments like medspiror, semen quality analyzer, EMG and TMT

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems in order to provide a context in which normal function can be correlated both with structure and with the biological basis, its clinical features, diagnosis and therapy.

### 3. BIOCHEMISTRY

**a. Competencies:** The learner must demonstrate an understanding of:

- Biochemical and molecular processes involved in health and disease,
- Importance of nutrition in health and disease,
- Biochemical basis and rationale of clinical laboratory tests, and demonstrate ability to interpret these in the clinical context.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course, the student shall be able to

- Enlist and describe the cell organelles with their molecular and functional organization.
- Delineate structure, function and interrelationships of various biomolecules and consequences of deviation from the normal.
- Understand basic enzymology and emphasize on its clinical applications wherein regulation of enzymatic activity is disturbed.
- Describe digestion and assimilation of nutrients and consequences of malnutrition.
- Describe and integrate metabolic pathways of various biomolecules with their regulatory mechanisms.
- Explain the biochemical basis of inherited disorders with their associated sequelae.
- Describe mechanisms involved in maintenance of water, electrolyte and acid base balance and consequences of their imbalances.
- Outline the molecular mechanisms of gene expression and regulation, basic principles of biotechnology and their applications in medicine.

c. **Skills :** At the end of the course, the student shall be able to:

- Make use of conventional techniques / instruments to perform biochemical analysis relevant to clinical screening and diagnosis;
- Analyse and interpret investigative data;
- Demonstrate the skills of solving scientific and clinical problems and decision making.

d. **Integration:** The teaching/learning programme should be integrated horizontally and vertically, as much as possible, to enable learners to make clinical correlations and to acquire an understanding of the cellular and molecular basis of health and disease.

## 2<sup>nd</sup> Professional Year:

### 4. PATHOLOGY

a. **Competencies:** The undergraduate must demonstrate:

- Comprehension of the causes, evolution and mechanisms of diseases,
- Knowledge of alterations in gross and cellular morphology of organs in disease states,
- Ability to correlate the natural history, structural and functional changes with the clinical manifestations of diseases, their diagnosis and therapy.

b. **Broad subject specific objectives**

**Knowledge:** At the end of one and half years, the student shall be able to:

- Describe the structure and ultra structure of a sick cell, causes and mechanisms of cell injury, cell death and repair.
- Correlate structural and functional alterations in the sick cell.
- Explain the pathophysiological processes, which govern the maintenance of





homeostasis, mechanisms of their disturbance and the morphological and clinical manifestation associated with it.

- Describe the mechanisms and patterns of tissue response to injury so as to appreciate the path physiology of disease processes and their application to clinical science.
- Correlate the gross and microscopic alterations of different organ systems in common disease to the extent needed for understanding disease processes and their clinical significance.
- Develop an understanding of steps in neoplastic changes in the body and their effects in order to appreciate need for early diagnosis and further management of neoplasia.
- Understand mechanisms of common hematological disorders and develop a logical approach in their diagnosis and management.
- Develop understanding of the blood banking, blood donors & transfusion of blood & blood products, (components).
- Understand pathophysiology of infectious diseases in relation with tissue changes.
- Describe the various immunological reactions in understanding the disease process & tissue transplant.
- Develop an understanding for genetic disorders.
- Understand the vital organ function test of Kidney, liver & thyroid.

**c. Skills :** At the end of one and half years, the student shall be able to:

- Describe the rationale and principles of routine technical procedures of the diagnostic laboratory tests & perform it.
- Interpret routine diagnostic laboratory tests and correlate with clinical, hematological and morphological changes.
- Perform the simple bed-side tests on blood, urine and other biological fluid samples:
- Draw a rational scheme of investigations aimed at diagnosing and managing the cases of common disorders.
- Able to understand the microscopic and macroscopic features of common diseases.
- Develop different type of skills such as observation skills, communication skill and presentation skill.
- Understand biochemical/physiological disturbances that occur as a result of disease in collaboration with preclinical department.

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in organ systems recognizing deviations from normal structure and function and clinically correlated so as to provide an overall understanding of the etiology, mechanisms, laboratory diagnosis, and management of diseases.



## 5. MICROBIOLOGY

### a. Competencies: The undergraduate learner demonstrates:

- Understanding of role of microbial agents in health and disease,
- Understanding of the immunological mechanisms in health and disease,
- Ability to correlate the natural history, mechanisms and clinical manifestations of infectious diseases as they relate to the properties of microbial agents,
- Knowledge of the principles and application of infection control measures,
- An understanding of the basis of choice of laboratory diagnostic tests and their interpretation, antimicrobial therapy, control and prevention of infectious diseases.
- Knowledge of outbreak investigation and its control.

### b. Broad subject specific objectives : At the end of the course the student will be able to :

- Explain how the different microorganisms can cause human infection.
- Understand commercial, opportunistic and pathogenic organisms and describe host parasite relationship.
- Describe the characteristics (morphology, cultural characteristics, resistance, virulence factors, incubation period, mode of transmission etc.) of different microorganisms.
- Explain the various defense mechanisms of the host against the microorganisms which can cause human infection.
- Describe the laboratory diagnosis of microorganisms causing human infections and disease.
- Describe the prophylaxis for the particular infecting microorganisms

### c. Skills : At the end of the course the student shall be able to

- Plan the laboratory investigations for the diagnosis of infectious diseases.
- Perform laboratory procedures to arrive at the etiological diagnosis of infectious diseases caused by bacteria, fungi, viruses and parasites including the drug sensitivity profile.
- Perform and interpret immunological and serological tests.
- Operate routine and sophisticated instruments in the laboratory.
- Develop microteaching skills and Pedagogy
- Successfully implement the chosen research methodology

### d. Integration: The teaching should be aligned and integrated horizontally and vertically in organ systems with emphasis on host-microbe-environment interactions and their alterations in disease and clinical correlations so as to provide an overall understanding of the etiological agents, their laboratory diagnosis and prevention.





## 6. PHARMACOLOGY

**a. Competencies:** The undergraduate must demonstrate:

- Knowledge about essential and commonly used drugs and an understanding of the pharmacologic basis of therapeutics,
- Ability to select and prescribe medicines based on clinical condition and the pharmacologic properties, efficacy, safety, suitability and cost of medicines for common clinical conditions of national importance,
- Knowledge of pharmacovigilance, essential medicine concept and sources of drug information and industry-doctor relationship,
- Ability to counsel patients regarding appropriate use of prescribed drug and drug delivery systems.

**b. Broad subject specific objectives :**

**Knowledge:** At the end of the course, the student shall be able to

- Describe the Pharmacokinetics and Pharmacodynamics of essential and commonly used drugs.
- Enlist the indications, contraindications, interactions and adverse reactions of commonly used drugs.
- Tailor the use of appropriate drugs in disease with consideration of its cost, efficacy and safety for individual needs and Mass therapy, under National Health Programs.
- Integrate the list of drugs of addiction and recommend the management of drug addiction.
- Explain pharmacological basis of prescribing drugs in special medical situations such as pregnancy, lactation, infancy, old age, renal damage, hepatic damage and immuno-compromised patients.
- Explain the concept of rational drug therapy in clinical pharmacology.
- State the principles underlying the concept of 'Essential Drugs'.
- Evaluate the ethics and modalities involved in the development and introduction of new drugs.

**c. Skills :** At the end of the course, the student shall be able to

- Prescribe drugs for common ailments.
- Identify adverse reactions and drug interactions of commonly used drugs.
- Interpret the data obtained from the experiments designed for the study of effect of drugs in various experimental and clinical studies.
- Analyze the information regarding common pharmaceutical preparations and critically evaluate drug formulations.
- Appraise the Principles of Clinical Pharmacy and Dispense the Medications giving





proper instructions.

- d. **Integration:** Practical knowledge of use of drugs in Clinical Practice will be acquired through Integrated Teaching vertically with Preclinical and Clinical subjects and horizontally with other Para clinical subjects.

### 3<sup>rd</sup> PROFESSIONAL YEAR

#### 7. FORENSIC MEDICINE AND TOXICOLOGY

a. **Competencies :** The learner must demonstrate:

- Understanding of medico-legal responsibilities of Physicians in primary and secondary care settings,
- Understanding of the rational approach to the investigation of crime, based on scientific and legal principles,
- Ability to manage medical and legal issues in cases of poisoning /overdose,
- Understanding the medico-legal framework of medical practice and medical negligence,
- Understanding of codes of conduct and medical ethics.

b. **Broad subject specific objectives:**

**Knowledge:** At the end of the course, the student shall be able to

- Identify the basic Medico-legal aspects of hospital and general practice.
- Define the Medico-legal responsibilities of a general Physician while rendering community service either in a rural primary health centre or an urban health centre.
- Appreciate the Physician's responsibilities in criminal matters and respect for the codes of Medical ethics.
- Diagnose, manage and identify legal aspect of common acute and chronic poisonings.
- Describe the Medico-legal aspects and findings of post-mortem examination in cases of death due to common unnatural conditions and poisonings.
- Detect occupational and environmental poisoning, prevention and epidemiology of common poisoning and their legal aspects particularly pertaining to Workmen's Compensation Act.
- Describe the general principles of analytical toxicology.

c. **Skills :** At the end of the course, the student shall be able to :

- As recommended by Medical Council of India Regulation, 1997 desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate for Forensic Medicine and Toxicology.
- Make observations and draw logical inferences in order to initiate enquiries in criminal

- matters and Medico-legal problems and be able to -
  - Carry on proper Medico-legal examination and documentation/Reporting of Injury and Age.
  - Conduct examination for sexual offences and intoxication.
  - Preserve relevant ancillary materials for medico-legal examination.
  - Identify important post-mortem findings in common unnatural deaths.
  - Diagnose and treat common emergencies in poisoning and chronic toxicity.
  - Make observations and interpret findings at post-mortem examination.
  - Observe the principles of medical ethics in the practice of his profession.
- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically recognizing the importance of medico-legal, ethical and toxicological issues as they relate to the practice of medicine.

## 8. COMMUNITY MEDICINE

a. **Competencies:** The undergraduate must demonstrate :

- Understanding of the concept of health and disease,
- Understanding of demography, population dynamics and disease burden in National and global context,
- Comprehension of principles of health economics and hospital management,
- Understanding of interventions to promote health and prevent diseases as envisioned in National and State Health Programmes.
- Understanding of physical, social, psychological, economic and environmental determinants of health and disease,
- Ability to recognize and manage common health problems including physical, emotional and social aspects at individual family and community level in the context of National Health Programmes,
- Ability to Implement and monitor National Health Programmes in the primary care setting,
- Knowledge of maternal and child wellness as they apply to national health care priorities and programmes,
- Ability to recognize, investigate, report, plan and manage community health problems including malnutrition and emergencies.

b. **Broad subject specific objectives:**

**Knowledge:** At the end of the course the student shall be able

- Explain the principles of sociology including demographic population dynamics.
- Identify social factors related to health, disease and disability in the context of urban and rural societies.

- Appreciate the impact of urbanization on health and disease.
- Observe and interpret the dynamic of community behaviors.
- Describe the elements of normal psychology and social psychology.
- Observe the principles of practice of medicine in hospital and community settings.
- Describe the health care delivery systems including rehabilitation of the disabled in the country.
- Describe the National Health Programmes with particular emphasis on maternal and child health programmes, family welfare planning and population control.
- Describe the epidemiological methods and techniques.
- Outline the demographic pattern of the country and appreciate the roles of the individuals, family, community and socio-cultural milieu in health and disease.
- Describe the health information systems.
- Acquire, understand, integrate, apply and manage information in context to health care problems and health care delivery system in various communities, health care settings and hospitals.
- Describe the principles and components of primary health care, National Rural Health Mission and the national health policies to achieve the goal of "Health for all" with regards to identify the environmental, bio-waste and occupational hazards and their control.
- Describe the importance of water and sanitation in human health.
- Describe the principles of health economics, health administration, health education in relation to community.
- Critically analyze the problem (s) and apply his/her knowledge to solve the problem in holistic manner.
- Describe and apply principles of prevention, promotion and maintenance of health.

**c. Skills :** At the end of the course, the student shall be able to :

- Use the principles and practice of medicine in hospital and community settings and familiarization with elementary practices.
- Use the Art of communication with patients including history taking and medico social work.
- Use epidemiology as a scientific tool to make rational decisions relevant to community and individual patient intervention.
- Organize health care services for vulnerable and disadvantages groups.
- Organize health care services in case of calamities.
- Collect, analyze, interpret and present simple community and hospital base data.
- Diagnose and manage common health problems (including communicable and non-communicable diseases) and emergencies at the individual, family and community levels keeping in mind the existing health care resources and in the context of the prevailing socio-culture beliefs.
- Diagnose and manage common nutritional problems at the individual and community



level.

- Plan, implement and evaluate a health education Programme with skill to use simple audio-visual aids.
- Interact with other members of the health care team and participate in the organization of health care services, health advocacy and implementation of national health programmes.
- Perform Administrative functions at health centers
- Observe the principles of medical ethics in the practice of his profession.

**d. Integration:** Department shall adopt an integrated approach towards other clinical disciplines, public health services, NGOs, environmental sciences, social sciences, management, hospital administration, research, etc. to impart training to enable the graduate to work at all levels of health care. The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the impact of environment, society and national health priorities as they relate to the promotion of health and prevention and cure of disease.

## **9. GENERAL MEDICINE**

**a. Competencies:** The student must demonstrate ability to do the following in relation to common medical problems of the adult in the community:

- Demonstrate understanding of the pathophysiologic basis, epidemiological profile, signs and symptoms of disease and their investigation and management,
- Competently interview and examine an adult patient and make a clinical diagnosis,
- Appropriately order and interpret laboratory tests,
- Initiate appropriate cost-effective treatment based on an understanding of the rational drug prescriptions, medical interventions required and preventive measures,
- Follow up of patients with medical problems and refer whenever required,
- Communicate effectively, educate and counsel the patient and family,
- Manage common medical emergencies and refer when required,
- Independently perform common medical procedures safely and understand patient safety issues.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course, the student shall be able to:

- Diagnose common clinical disorders with special reference to infectious diseases, nutritional disorders, tropical and environmental diseases;



- Outline various modes of management including drug therapeutics especially dosage, side effects, toxicity, interactions, indications and contra-indications;
- Propose diagnostic and investigative procedures and ability to interpret them;
- Provide first level management of acute emergencies promptly and efficiently and decide the timing and level of referral, if required;
- Recognize geriatric disorders and their management.

**c. Skills :** At the end of the course, the student shall be able to :

- Develop clinical skills (history taking, clinical examination and other instruments of examination) to diagnose various common medical disorders and emergencies;
- Refer a patient to secondary and/or tertiary level of health care after having instituted primary care;
- Perform simple routine investigations like hemogram, stool, urine, sputum and biological fluid examinations;
- Assist the common bedside investigative procedure like pleural tap, Lumbar puncture, bone marrow aspiration/biopsy and liver biopsy.

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide sound biologic basis and incorporating the principles of general medicine into a holistic and comprehensive approach to the care of the patient. With other relevant academic inputs which provide scientific basis of clinical medicine e.g. anatomy, physiology, biochemistry, microbiology, pathology and pharmacology.

## 10. DERMATOLOGY

**a. Competencies:** The undergraduate student must demonstrate:

- Understanding of the principles of diagnosis of diseases of the skin, hair, nail and mucosa,
- Ability to recognize, diagnose, order appropriate investigations and treat common diseases of the skin including leprosy in the primary care setting and refer as appropriate,
- A syndromic approach to the recognition, diagnosis, prevention, counseling, testing and management of common sexually transmitted diseases including HIV based on national health priorities,
- Ability to recognize and treat emergencies including drug reactions and refer as appropriate.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course of Dermatology the student shall be able to :

- Demonstrate sound knowledge of common diseases, their clinical manifestations,



including emergent situations and of investigative procedures to confirm their diagnosis

- Demonstrate comprehensive knowledge of various modes of therapy used in treatment of cutaneous, sexually transmitted diseases and leprosy
- Describe the mode of action of commonly used drugs, their doses, side effects/toxicity, indications and contra-indications and interactions
- Describe commonly used modes of management including the medical and surgical procedures available for the treatment of various diseases and to offer a comprehensive plan of management for a given disorder

**c. Skills:** The student shall be able to :

- Interview the patient, elicit relevant and correct information and describe the history in a chronological order:
- Conduct clinical examination, elicit and interpret physical findings and diagnose common disorders and emergencies.
- Demonstrate simple, routine investigative and laboratory procedures required for making the bed-side diagnosis, especially the examination of scrapings for fungus, preparation of slit smears and staining for AFB for leprosy patients and for STD cases and take a skin biopsy for diagnostic purposes.
- Manage common diseases and recognizing the need for referral for specialized care, in case of inappropriateness of therapeutic response.

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to emphasize the biologic basis of diseases of the skin, sexually transmitted diseases and leprosy

## 11. PSYCHIATRY

**a. Competencies:** The student must demonstrate:

- Ability to promote mental health and mental hygiene,
- Knowledge of etiology (bio-psycho-social-environmental interactions), clinical features, diagnosis and management of common psychiatric disorders across all ages,
- Ability to recognize and manage common psychological and psychiatric disorders in a primary care setting, institute preliminary treatment in disorders difficult to manage, and refer appropriately,
- Ability to recognize alcohol/ substance abuse disorders and refer them to appropriate centers,
- Ability to assess risk for suicide and refer appropriately,
- Ability to recognize temperamental difficulties and personality disorders,
- Assess mental disability and rehabilitate appropriately,



- Understanding of National and State programmes that address mental health and welfare of patients and community.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course the student shall be able to:

- Understand the comprehensive nature & development of different aspects of normal human behavior like learning, memory, motivation, personality & intelligence
- Recognize differences between normal & abnormal behavior
- Classify psychiatric disorders
- Recognize clinical manifestations of the following common syndromes & plan their appropriate management of organic psychosis, functional psychosis, schizophrenia, affective disorders, neurotic disorders, personality disorders, psycho physiological disorders, drug & alcohol dependence, psychiatric disorders of childhood & adolescence
- Describe rational use of different mode of therapy in psychiatric disorders.

**c. Skills:** The student shall be able to:

- Interview the patient & understand different methods of communications in patient-doctor relationship
- Elicit detailed psychiatric case history & conduct clinical examination for assessment of mental status
- Define, elicit & interpret psychopathological symptoms & signs
- Diagnose & manage common psychiatric disorders
- Identify & manage common psychological reactions & psychiatric disorders in medical & surgical patients in clinical practice & in community setting

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand bio-psycho-social-environmental interactions that lead to diseases/ disorders for preventive, promotive, curative, rehabilitative services and medico-legal implications in the care of patients both in family and community.

## 12. RESPIRATORY MEDICINE

**a. Competencies:** The student must demonstrate:

- Knowledge of common chest diseases, their clinical manifestations, diagnosis and management,
- Ability to recognize, diagnose and manage pulmonary tuberculosis as contemplated in National Tuberculosis Elimination programme,



- Ability to manage common respiratory emergencies in primary care setting and refer appropriately.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course of Pulmonary Medicine, the student shall be able to:

- Demonstrate sound knowledge of common chest diseases, their manifestations, including emergency situations and of investigative procedures to confirm their diagnosis.
- Demonstrate comprehensive knowledge of various modes of therapy used in treatment of respiratory diseases.
- Describe the modes of action of commonly used drugs, their doses, side effects/toxicity, indications and contra indications and interactions.
- Describe commonly used modes of management including medical and surgical procedures available for treatment of various diseases and to offer a comprehensive plan of management inclusive of Revised National Tuberculosis Control programme.

**c. Skills :** The student shall be able to :

- Interview the patient, elicit relevant and correct information and describe the history in chronological order;
- Conduct clinical examination, elicit and interpret clinical findings and diagnose common respiratory disorders and emergencies;
- Perform simple, routine investigative and office procedures required for making the bed side diagnosis especially sputum collection and examination for etiologic organisms especially Acid fast Bacilli (AFB), interpretation of the chest x-rays and respiratory function tests;
- Interpret and manage various blood gases and PH abnormalities in various respiratory diseases;
- Manage common diseases recognizing need for referral for specialized care, in case of inappropriateness of therapeutic responses;
- Assist in the performance of common procedures. like laryngoscopic examination, pleural aspiration, respiratory physiotherapy, laryngeal intubation and pneumothoracic drainage/aspiration

- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to recognize diagnose and treat TB and other lung diseases in the context of the society, national health priorities, drug resistance and co-morbid conditions like HIV.



### 13. PEDIATRICS

**a. Competencies:** The student must demonstrate:

- Ability to assess and promote optimal growth, development and nutrition of children and adolescents and identify deviations from normal,
- Ability to recognize and provide emergency and routine ambulatory and First Level Referral Unit care for neonates, infants, children and adolescents and refer as may be appropriate,
- Ability to perform procedures as indicated for children of all ages in the primary care setting,
- Ability to recognize children with special needs and refer appropriately,
- Ability to promote health and prevent diseases in children,
- Ability to participate in National Programmes related to child health and in conformation with the Integrated Management of Neonatal and Childhood Illnesses (IMNCI) Strategy,
- Ability to communicate appropriately and effectively.

**b. Broad subject specific objectives:**

**Knowledge:-**At the end of the course, the students shall be able to:-

- Describe the normal Growth and Development during fetal life, Neonatal period, Childhood and Adolescence and the deviations thereof.
- Describe the common Pediatric disorders and emergencies in terms of Epidemiology, Etiopathogenesis, Clinical manifestations, Diagnosis and also describe the rational therapy and rehabilitation services.
- Workout age related requirements of calories, nutrients, fluids, dosages of drugs etc. in health and disease.
- Describe preventive strategies for common infectious disorders, Malnutrition, Genetic and Metabolic disorders, Poisonings, Accidents and Child abuse.
- Outline national programs related to child health including Immunization programs.

**c. Skills :** At the end of the course, the students shall be able to:-

- Take detailed Pediatric and Neonatal history and conduct an appropriate physical examination of children and neonates, make clinical diagnosis, conduct common bedside investigative procedures, interpret common laboratory investigations, plan and institute therapy.
- Take anthropometric measurements, resuscitate newborn, prepare oral rehydration solution, perform tuberculin test, administer vaccines available under current National programs, perform venesection, start intravenous fluids and provide nasogastric feeding.





- Conduct diagnostic procedures such as lumbar puncture, liver and kidney biopsy, bone marrow aspiration, pleural and ascitic tap.
  - Distinguish between normal Newborn babies and those requiring special care and institute early care to all newborn babies including care of preterm and low birth weight babies, provide correct guidance and counseling about breastfeeding and Complementary feeding.
  - Provide ambulatory care to all not so sick children, identify indications for specialized/ inpatient care and ensure timely referral to those who require hospitalization.
- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for neonates, infants, children and adolescents based on a sound knowledge of growth, development, disease and their clinical, social, emotional, psychological correlates in the context of national health priorities.

#### 14. GENERAL SURGERY

a. **Competencies:** The student must demonstrate:

- Understanding of the structural and functional basis, principles of diagnosis and management of common surgical problems in adults and children
- Ability to choose, calculate and administer appropriately intravenous fluids, electrolytes, blood and blood products based on the clinical condition
- Ability to apply the principles of asepsis, sterilization, disinfection, rational use of prophylaxis, therapeutic utilities of antibiotics and universal precautions in surgical practice
- Knowledge of common malignancies in India and their prevention, early detection and therapy
- Ability to perform common diagnostic and surgical procedures at the primary care level
- Ability to recognize, resuscitate, stabilize and provide Basic & Advanced Life Support to patients following trauma
- Ability to administer informed consent and counsel patient prior to surgical procedures,
- Commitment to advancement of quality and patient safety in surgical practice.

b. **Broad subject specific objectives.**

**Knowledge:** At the end of course, the student should be able to:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies in adult and children.
- Define indications and methods for fluid and electrolytes replacement therapy

including blood transfusion.

- Define asepsis, disinfection and sterilization and recommend judicious use of antibiotics.
- Describe common malignancies in the country and their management including prevention.
- Enumerate different types of anaesthetic agents, their indications, contraindications, mode of administration, and side effects.

**c. Skills :** At the end of the course, the student should be able to:

- Diagnose common surgical conditions both acute and chronic, in adults and children.
- Plan various laboratory tests for surgical conditions and interpret the results.
- Identify and manage patients of hemorrhagic, septicemia and other types of shock.
- Be able to maintain patent air-way and resuscitate.
- Monitor patient of head, chest, spinal and abdominal injuries, both in adults and children.
- Provide primary care for a patient of burns.
- Acquire principles of operative surgery including preoperative, operative and post operative care and monitoring.
- Treat open wound including preventive measures against tetanus and gas gangrene.
- Diagnose neonatal and pediatric surgical emergencies and provide sound primary care before referring the patient to secondary/tertiary centres.
- Identify congenital anomalies and refer them for appropriate management.

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide a sound biologic basis and a holistic approach to the care of the surgical patient.

- Apply knowledge of basic medical sciences and other relevant subjects to support understanding of various pathologies, facilitate examination of and intervention for the patients.
- To apply the principles of quality of health care, legal and ethical principles and regulations as recommended by Medical Council of India and WHO.

## **15. ORTHOPAEDICS (INCLUDING PHYSICAL MEDICINE & REHABILITATION)**

**a. Competencies:** The student must demonstrate:

- Ability to recognize and assess bone injuries, dislocation and poly-trauma and provide first contact care prior to appropriate referral,



- Knowledge of the medico-legal aspects of trauma,
- Ability to recognize and manage common infections of bone and joints in the primary care setting,
- Recognize common congenital, metabolic, neoplastic, degenerative and inflammatory bone diseases and refer appropriately,
- Ability to perform simple orthopedic techniques as applicable to a primary care setting,
- Ability to recommend rehabilitative services for common orthopaedic problems across all ages.

**b. Broad subject specific objectives**

**Knowledge:** The student shall be able to understand:

- The principles, diagnosis and primary management and be able to give appropriate referral for further definitive management of bones and joint injuries.
- Osteogenesis, manifestation and diagnosis, primary management and give their referral for appropriate correction or rehabilitation of common musculoskeletal disorders including infections of bones and joints; congenital skeletal anomalies, metabolic bone diseases and neoplasm affecting bones.

**c. Skills :** At the end of the course, the student shall be able to:

- Detect soft tissue injuries such as sprains and strains.
- Detect common fractures of extremities.
- Deliver first aid measures for common fractures and sprains.
- Deliver emergency measures to poly trauma patients.
- Manage uncomplicated fractures of clavicle, forearm, phalanges etc.
- Use techniques of splinting such as application of Thomas splint, plaster slab and casts, immobilization by skin tractions etc.
- Learn indications for closed reductions, open reductions, internal fixation and external fixations of fracture.
- Manage common bone infection; learn indications for sequestration, amputation and corrective measures for bone deformities.
- Advice and counsel patient for rehabilitation for post traumatic, poliomyelitis, cerebral palsy and amputation.
- Be able to perform certain orthopedic skills, provide sound advice of skeletal and related conditions at primary or secondary health care level.

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of orthopedic problems, their management and correlation with function, rehabilitation and quality of life.

## 16. ANAESTHESIOLOGY

**a. Competencies:** The student must demonstrate ability to:

- Describe and discuss the pre-operative evaluation, assessing fitness for surgery and the modifications in medications in relation to anesthesia /surgery,
- Describe and discuss the roles of Anesthesiologist as a peri-operative Physician including pre-medication, endotracheal intubation, general anesthesia and recovery (including variations in recovery from anesthesia and anaesthetic complications),
- Describe and discuss the management of acute and chronic pain, including labour analgesia,
- Demonstrate awareness about the maintenance of airway in children and adults in various situations,
- Demonstrate the awareness about the indications, selection of cases and execution of cardio- pulmonary
- Resuscitation in emergencies and in the intensive care and high dependency units,
- Choose cases for local / regional anesthesia and demonstrate the ability to administer the same,
- Discuss the implications and obtain informed consent for various procedures and to maintain the documents.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course, the student shall be able to :

- Know of simple nerve block and pain relief
- Awareness of the principles of administration of general, regional and local anesthesia.
- Know importance of hypoglycemia/hyperglycemia, hypotension/hypertension, IHD, Myocardial infarction.
- Know ventilators.

**c. Skills :** At the end of the training, the students should be able to:

- Perform cardio-pulmonary resuscitation with the available resources and transfer the patients to a bigger hospital for advanced life support.
- Set up intravenous infusion and manage fluid therapy
- Clear and maintain airway in unconscious patient.
- Administer oxygen correctly

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for patients undergoing various surgeries, in patients



with pain, in intensive care and in cardio respiratory emergencies. Integration with the preclinical department of Anatomy, para- clinical department of Pharmacology and horizontal integration with any/all surgical specialties is proposed.

## 17. RADIODIAGNOSIS

**a. Competencies:** The student must demonstrate:

- Understanding of indications for various radiological investigations in common clinical practice,
- Awareness of the ill effects of radiation and various radiation protective measures to be employed,
- Ability to identify abnormalities in common radiological investigations.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course, the student shall be able to :

- Enlist and describe the various diagnostic modalities
- Delineate normal and abnormal radiological findings
- Understand basic radiology and emphasize on its clinical applications
- Describe radiographic, ultra sonographic, CT, MRI features of common pathologies.
- Describe and integrate radiological findings in CNS, GIT, RS, CVS, MSK, GUT

**c. Skills** At the end of the course, the student shall be able to:

- Make use of Imaging findings to reach to a diagnosis;
- Analysis and interpret radiological data;
- Demonstrate the skills of solving clinical problems by illustrative evidences and decision making.

**d. Integration:** Horizontal and vertical integration to understand the fundamental principles of radiologic imaging, anatomic correlation and their application in diagnosis and therapy

## 18. OTO-RHINOLARYNGOLOGY (ENT)

**a. Competencies:** The learner must demonstrate :

- Knowledge of the common Otorhinolaryngological (ENT) emergencies and problems,
- Ability to recognize, diagnose and manage common ENT emergencies and problems in primary care setting,



- Ability to perform simple ENT procedures as applicable in a primary care setting,
- Ability to recognize hearing impairment and refer to the appropriate hearing impairment rehabilitation programme.

**b. Broad subject specific objectives:**

**Knowledge:** At the end of the course, the student shall be able to :

- Describe the basic pathophysiology of common Ear, Nose & Throat (ENT) diseases & emergencies.
- Adopt the rational use of commonly used drugs keeping in mind their adverse reactions.
- Suggest common investigative procedures & their interpretation.

**c. Skills:** At the end of the course the student shall be able to :

- Examination & Diagnose common ENT problems including pre-malignant & Malignant disorders of the Head & Neck.
- Manage ENT problems at first level of care & be able to refer whenever necessary.
- Assist / carry out minor ENT procedures like ear syringing, ear dressing, nasal packing.
- Assist in certain procedures such as tracheotomy, endoscopy & removal of foreign bodies.

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the learner to understand the structural basis of ENT problems, their management and correlation with function, rehabilitation and quality of life. The undergraduate training ENT will provide an integrated approach towards other disciplines especially, neurosciences, ophthalmology & general surgery.

## **19. OPHTHALMOLOGY**

**a. Competencies:** The student must demonstrate:

- Knowledge of common eye problems in the community
- Recognize, diagnose and manage common eye problems and identify indications for referral,
- Ability to recognize visual impairment and blindness in the community and implement national programmes as applicable in the primary care setting.

**b. Broad subject specific objectives**

**Knowledge:** At the end of the course, student shall have the knowledge of



- Common problems affecting the eye.
- Principles of management of major ophthalmic emergencies.
- Main systemic disease affecting the eye.
- Effects of local and systemic diseases on patient's vision and the necessary action required minimizing the sequelae of such diseases.
- Adverse drug reaction with special reference to ophthalmic manifestations.
- Magnitude of blindness in India and its main causes.
- National programme for control of blindness and its implementation at various levels.
- Eye care education for prevention of eye problems.
- Role of primary health center in organization of eye camps.
- Organization of primary health care and the functioning of the ophthalmic assistant.
- Integration of the national programme for control of blindness with the other national health programmes.
- Eye bank organization.

#### c. Skills

- Elicit a history pertinent to general health and ocular status.
- Assist in diagnostic procedures such as visual acuity testing, examination of eye, Schiotz tonometry, Staining of Corneal pathology, confrontation, perimetry, Subjective refraction including correction of Presbyopia and aphakia, direct ophthalmoscopy and conjunctival smear examination and Cover test.
- Diagnose and treat common problems affecting the eye.
- Interpret ophthalmic signs in relation to common systemic disorders.
- Assist/observe therapeutic procedures such as Subconjunctival injection, corneal conjunctival foreign body removal, carbolic cautery for corneal ulcers, Nasolacrimal duct syringing and tarsorrhaphy
- Provide first aid in major ophthalmic emergencies.
- Assist to organize community surveys for visual check-up.
- Assist to organize primary eye care service through primary health centers.
- Use effective means of communication with the public and individual to motivate for surgery in cataract and for eye donation.
- Establish rapport with his seniors, colleagues and paramedical workers, so as to effectively function as a member of the eye care team.

- d. **Integration:** The teaching should be aligned and integrated horizontally and vertically in order to allow the student to understand the structural basis of ophthalmologic problems, their management and correlation with function, rehabilitation and quality of life.

## 20. OBSTETRICS AND GYNAECOLOGY

**a. Competencies:** The student must demonstrate ability to:

- Provide peri-conceptional counseling and ante natal care,
- Identify high-risk pregnancies and refer appropriately,
- Conduct normal deliveries, using safe delivery practices in the primary and secondary care settings,
- Prescribe drugs safely and appropriately in pregnancy and lactation,
- Diagnose complications of labor, institute primary care and refer in a timely manner,
- Perform early neonatal resuscitation,
- Provide postnatal care, including education in breast-feeding,
- Counsel and support couples in the correct choice of contraception,
- Interpret test results of laboratory and radiological investigations as they apply to the care of the obstetric patient,
- Apply medico-legal principles as they apply to tubectomy, Medical Termination of Pregnancy (MTP), Pre-conception and Prenatal Diagnostic Techniques (PC PNDT Act) and other related Acts.
- Elicit a gynecologic history, perform appropriate physical and pelvic examinations and PAP smear in the primary care setting,
- Recognize, diagnose and manage common reproductive tract infections in the primary care setting,
- Recognize and diagnose common genital cancers and refer them appropriately.

**b. Broad subject specific objectives**

**Knowledge :** At the end of the course, the student shall be able to:

- Outline the anatomy, physiology and pathophysiology of the reproductive system and the common conditions affecting it.
- Diagnose normal pregnancy, labour, puerperium and manage the problems he is likely to encounter therein.
- List of leading causes of maternal and perinatal morbidity and mortality.
- Understand the principles of contraception and various techniques employed, methods of medical termination of pregnancy, sterilization and their complications.
- Identify the use, abuse and side effects of drugs in pregnancy, peri- menopausal and post-menopausal periods.
- Describe the national programme of maternal and child health and family welfare and their implementation at various levels.
- Identify common gynecological diseases and describe principles of their management.





- State the indications, techniques and complications of surgeries like Caesarian section, laparotomy, abdominal and vaginal hysterectomy, Fothergill's operation and vacuum
- Aspiration for Medical Termination of pregnancy (MTP) and minor surgeries like EB, D and C, Cervical Biopsy and Cervical encircelage.

**c. Skills :** At the end of the course, the student should be able to

- Take proper history and writing a good case sheet
- Writing a good discharge summary, proper referral letter
- Examination of patient and arrival at a diagnosis
- Planning for investigation and treatment
- Community orientation, participation in community health promoting and preventing programmes
- Examine a pregnant woman, recognize high- risk pregnancies and make appropriate referrals.
- Conduct a normal delivery, plot and inter pretepartogram
- Recognize complications and decision of referral, provide postnatal care,
- Resuscitate the newborn and recognize the congenital anomalies.
- Advise a couple on the use of various available contraceptive devices (student should see at least 5 Cu-Tinsertions and 5 cases of female sterilization operations.)
- Perform pelvic examination, diagnose and manage common. gynecological problems including early detection of genital malignancies.
- Make a vaginal cytological smear, perform a post coital test and wet vaginal smear examination for Trichomonas vaginalis, Moniliasis and gram stain for gonorrhea, catheterization of urinary bladder
- Interpretation of data of investigations like biochemical, histopathological, radiological ultrasound etc.

**d. Integration:** The teaching should be aligned and integrated horizontally and vertically in order to provide comprehensive care for women in their reproductive years and beyond, based on a sound knowledge of structure, functions and disease and their clinical, social, emotional, psychological correlates in the context of national health priorities. The student shall be able to integrate clinical skills with other disciplines and bring about coordination of family welfare programme for the national goal of population control.

## **B. PHASE WISE TRAINING AND TIME DISTRIBUTION FOR PROFESSIONAL DEVELOPMENT**

The Competency based Undergraduate Curriculum and Attitude, Ethics and Communication (AETCOM) course, as published by the Medical Council of India and also made available on the Council's website, shall be the curriculum for the batches admitted in MBBS from the academic year 2019-20 onwards.

In order to ensure that training is in alignment with the goals and competencies required for a medical graduate, there shall be a **Foundation Course** to orient medical learners to MBBS programme, and provide them with requisite knowledge, communication (including electronic), technical and language skills.

### **I. Training period and time distribution:**

Universities shall organize admission timing and admission process in such a way that teaching in the first Professional year commences with induction through the Foundation Course by the 1<sup>st</sup> of August of each year. There shall be no admission of students in respect of any academic session beyond 30<sup>th</sup> August under any circumstance. The Universities shall not register any student admitted beyond the said date.

The National Medical Commission may direct, that any student identified as having Obtained admission after the last date for closure of admission be discharged from the Course of study, or any medical qualification granted to such a student shall not be a recognized qualification by National Medical Commission.

The institution which grants admission to any student after the last date specified from the same shall also be liable to face such action as may be prescribed by National Medical Commission.

Every learner shall undergo a period of certified study extending over 4 ½ academic years, divided into four professional years from the date of commencement of course to the date of completion of examination which shall be followed by one year of compulsory rotating internship.

Each academic year will have at least 39 teaching weeks with a minimum of eight hours of working on each day including one hour as lunch break.

Didactic lectures shall not exceed one third of the schedule; two third of the schedule shall include interactive sessions, practicals, clinical or/and group discussions. The learning process should include clinical experiences, problem- oriented approach, case studies and community health care activities.



Teaching and learning shall be aligned and integrated across specialties both vertically and horizontally for better learner comprehension. Learner centered learning methods should include Early Clinical Exposure, problem-oriented learning, case studies, community- oriented learning, self- directed, experiential learning& Electives.

At the end of each professional year University examination will be conducted. If any student fails to clear University examination, he will appear in supplementary examination.

**Supplementary examinations and declaration of results shall be processed within 3-6 weeks from the date of declaration of the results of the main examination for every professional year, so that the candidates, who pass, can join the main batch for progression.**

**If the candidate fails in the supplementary examination of first MBBS, he shall join the batch of next academic /subsequent year. There shall be no supplementary batches. Partial attendance of examination in any subject shall be counted as an attempt.**

- A candidate, who fails in the First Professional examination, shall not be allowed to join the Second Professional.
- A candidate, who fails in the second Professional examination, shall be allowed to join the third Professional Part I training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.
- A candidate who fails in the third Professional (Part I) examination shall be allowed to join third Professional part II training, however he shall not be allowed to appear for the examination unless he has passed second professional examination.

## **II. The period of 4½ years is divided as follows:**

### **Phase I –Total 12 months**

#### **i) First Professional phase of 12 months including Foundation Course of one week and University exams.**

It shall consist of preclinical subjects – Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics & Communication (AETCOM) module, family adoption programme through village outreach, Pandemic module and early clinical exposure, ensuring alignment & all types of integration and simulation-based learning.



## **Phase II- Second Professional (12 months) including University exam.**

It will consist of Pathology, Pharmacology, Microbiology, family visit under Community Medicine, General Surgery, General Medicine & Obstetrics & Gynecology Professional development including AETCOM module, simulation-based learning and introduction to clinical subjects ensuring both alignment & all types of integration.

The clinical exposure to learners will be in the form of learner-doctor method of clinical training in all phases. The emphasis will be on primary, preventive and comprehensive health care. A part of training during clinical postings should take place at the *primary level* of health care. It is desirable to provide learning experiences in secondary health care, wherever possible. This will involve:

- Experience in recognizing and managing common problems seen in outpatient, inpatient and emergency settings,
- Involvement in patient care as a team member,
- Involvement in patient management and performance of basic procedures.

### **iii) Phase III - 30 months**

#### **a. Third Professional Part I (12 months, including University exams)**

Forensic Medicine and Toxicology, Community Medicine, Medicine & allied, Surgery & allied, Pediatrics and Obstetric & Gynecology including AETCOM, Pandemic module, Clinical teaching in General Medicine, General Surgery, Obstetrics & Gynecology, Pediatrics, Orthopedics, Dermatology, Community Medicine, Psychiatry, Respiratory Medicine, Radio-diagnosis (& Radiotherapy) and Anesthesiology & Professional development.

**b. Electives** (1 month) shall be included here. These will be in 2 blocks of 15 days each in Final first; 1<sup>st</sup> block after annual exam of III MBBS part 1 and 2<sup>nd</sup> block after the end of 1<sup>st</sup> elective.

#### **c. Third Professional Part II (18 months, including University exam)**

##### **Subjects include:**

- Medicine and allied specialties (General Medicine, Psychiatry, Dermatology (including Venereology and Leprosy, Respiratory Medicine (including Tuberculosis)
- Surgery and allied specialties (General Surgery, Otorhinolaryngology, Ophthalmology, Orthopedics, Dentistry, Physical Medicine and rehabilitation, Anesthesiology and Radiodiagnosis)
- Obstetrics and Gynecology (including Family Welfare)
- Pediatrics
- AETCOM module



### **III. Distribution of teaching hours phase wise**

#### **a. First, second and third Professional part-I, teaching hours:**

**Time allotted** : 12 months (approx. 52 weeks)  
**Time available** : Approx. **39 weeks** (excluding 13 weeks) (39 hours/ week)

Prelim / University Exam & Results: 9 weeks

Vacation: 2 weeks

Public Holidays: 2 weeks

**Time distribution in weeks: 39 weeks x 39 hours = 1521 available hours for Teaching- Learning**

#### **b. Final MBBS part-2, teaching hours:**

**Time allotted** : 18 months (approx. 78 weeks)  
**Time available** : Approx. **62 weeks** (excluding 16 weeks) (39 hours/ week)

Prelim / University Exam & Results: 10 weeks

Vacation: 3 weeks

Public Holidays: 3 weeks

**Time distribution in weeks: 62 x 39 hrs = 2418 hrs available hours for Teaching- Learning**

**(Clinical Postings: 15 hours/ week II MBBS onwards included in academic schedule)**

These are attached in sperate annexure with all relevant tables.

- ❖ Academic calendar shall be as per the Table 1.
- ❖ Distribution of subjects for Professional Phase – wise training is given in Table 2.
- ❖ Minimum teaching hours prescribed in various disciplines are given in Tables 3-7.
- ❖ Distribution and duration of clinical postings is given in Table 8.

Time allotted excludes time reserved for internal /University examinations, and vacation.

Second professional clinical postings shall commence before / after declaration of results of the first professional phase examinations, as decided by the institution/ University.

Third Professional parts I and part II clinical postings shall start no later than two weeks after the completion of the previous professional examination.





A total of 25% of allotted time of third Professional shall be utilized for integrated learning with phase I and II subjects. This will be included in the assessment of clinical subjects.

**Note :**

- The period of training is minimum suggested. Adjustments where required depending on availability of time may be made by the concerned college/ institution. This period of training does not include University examination period.
- An exposure to skills lab for at least two (02) weeks prior to clinical postings shall be made available to all student.

**C) New teaching /learning elements**

**1) Foundation Course**

**Goal:** The goal of the Foundation Course is to prepare a learner to study medicine effectively.

**Objectives:**

**(a)**

**Orient the learner to:**

- The medical profession and the Physician's role in society
- The MBBS programme
- Alternate health systems i.e. AYUSH in India and history of Medicine
- Medical ethics, attitudes and professionalism
- Health care system and its delivery
- National health programmes and policies
- Universal precautions and vaccinations
- Patient safety and biohazard safety
- Principles of primary care (general and community based care)
- The academic ambience

**(b) Enable the learner to acquire enhanced skills in:**

- Language
- Interpersonal relationships
- Communication
- Learning including self-directed learning
- Time management
- Stress management
- Use of information technology, and artificial intelligence

**(c) Train the learner to provide:**

- First-aid
- Basic life support



- In addition to the above, learners may be enrolled in one of the following programmes which will be run concurrently:
- Local language programme
- English language programme
- Computer skills

These may be done in the last two hours of the day. These sessions must be as interactive as possible.

Sports (to be used through the Foundation Course as protected 04 hours /week).

Leisure and extracurricular activity (to be used through the Foundation Course as projected 02 hours per week).

Institutions shall develop learning modules and identify the appropriate resource persons for their delivery.

The time committed for the Foundation Course may not be used for any other curricular activity.

The Foundation Course shall have a minimum of 75% attendance of all students mandatorily. This will be certified by the Dean of the college.

The Foundation Course shall be organized by the Coordinator appointed by the Dean of the college and shall be under supervision of the Heads of MBBS phase 1 departments.

Every college shall arrange for a meeting with parents/ wards of all students and records of the same shall be made available to UGMEB of NMC.

## 2) Early Clinical Exposure

**Objectives:** The objectives of early clinical exposure of the first-year medical learners are to enable the learner to:

- Recognize the relevance of basic sciences in diagnosis, patient care and management,
- Provide a context that will enhance basic science learning,
- Relate to experience of patients as a motivation to learn,
- Recognize attitude, ethics and professionalism as integral to doctor-Patient relationship,
- Understand the socio-cultural context of disease through the study of humanities.

- Elements
- Basic science correlation: i.e. apply and correlate principles of basic sciences as they relate to patient care (this shall be part of integrated modules).
- Clinical skills: to include basic skills in interviewing patients, doctor-patient communication, ethics and professionalism, critical thinking and analysis and self-learning (this training shall be imparted in the time allotted for early clinical exposure).
- Humanities: To introduce learners to a broader understanding of the socio-economic framework and cultural context within which health is delivered through the study of humanities and social sciences.

### 3) Electives

**Objectives:** To provide the learner with opportunities:

- For diverse learning experiences,
- It is mandatory for learners to do an elective. The elective time shall not be used to make up for missed clinical postings, shortage of attendance or other purposes.
- Institutions will pre-determine the number and nature of electives, names of the supervisors, and the number of learners in each elective based on the local conditions, available resources and faculty.
- 
- Electives on topics in areas such as Research methodology, Use of Artificial intelligence and computers in Health and Medical Education, Health Management, Health economics, Indian system of medicine, Medical photography /clinical photography, Global health, Evidence based medicine, Art and music in medicine, Literary activities, etc. may be provided by the college/ institution.
- It shall be preferable that elective choices are made available to the learners in the beginning of the academic year.
- The learner must submit a learning log book based on both blocks of the electives.
- 75% attendance in the electives and submission of log book maintained during electives is required for eligibility to appear in the final MBBS examination/ NEXT.
- Institutions may use part of this time for strengthening basic skill certification.





#### **4) Professional Development including Attitude, Ethics and Communication Module (AETCOM)**

**Objectives** of the programme : At the end of the programme, the learner must demonstrate ability to:

- Understand and apply principles of bioethics and law as they apply to medical practice and research, understand and apply the principles of clinical reasoning as they apply to the care of the patients,
- Understand and apply the principles of system-based care as they relate to the care of the patient,
- Understand and apply empathy and other human values to the care of the patient,
- Communicate effectively with patients, families, colleagues and other health care professionals,
- Understand the strengths and limitations of alternative systems of medicine,
- Respond to events and issues in a professional, considerate and humane fashion,
- Translate learning from the humanities in order to further his professional and personal growth.

#### **Learning experiences:**

- This will be a longitudinal programme spread across the continuum of the MBBS programme including internship,
- Learning experiences shall include small group discussions, patient care scenarios, workshops, seminars, role plays, lectures etc.
- Attitude, Ethics & Communication Module (AETCOM module) developed by the erstwhile Medical Council of India should be used longitudinally for purposes of instruction.
- 75% attendance in Professional Development Programme (AETCOM Module) shall be mandatory for eligibility to appear for final examination in each professional year.

#### **Internal Assessment shall include:**

- Written tests comprising of short notes and creative writing experiences,
- OSCE based clinical scenarios /viva voce.
- At least one question in each paper of each clinical specialty in the University examination shall test knowledge competencies acquired during the professional development programme.
- Skill competencies acquired during the Professional Development Programme must be tested during the clinical, practical and viva voce.



## **5) Learner-doctor method of clinical training (Clinical Clerkship)**

**a. Goal:** To provide learners with experience in:

- Longitudinal patient care,
- Being part of the health care team,
- Hands-on care of patients in outpatient and in-patient setting.

**b. Structure:**

- The first clinical posting in second professional shall orient learners to the patient, their roles and the specialty.
- The learner-doctor programme shall progress as outlined in Table 9.
- The learner shall function as a part of the health care team with the following responsibilities:
  - Be a part of the units' out-patient services on admission days,
  - Remain with the admission unit until at least 6 PM except during designated class hours,
  - Be assigned patients admitted during each admission day for whom he will undertake responsibility, under the supervision of a senior resident or faculty member,
  - Participate in the unit rounds on its admission day and will present the assigned patients to the supervising Physician,
- Follow the patient's progress throughout the hospital stay until discharge,
- Participate, under supervision, in procedures, surgeries, deliveries etc. of assigned patients,
- Participate in unit rounds on at least one other day of the week excluding the admission day,
- Discuss ethical and other humanitarian issues during unit rounds,
- Attend all scheduled classes and educational activities,
- Document his observations in a prescribed log book /case record.

No learner will be given independent charge of the patient in the capacity of primary Physician of the concerned patient.

The supervising Physician shall be responsible for all patient care decisions and guide the learner from time to time as required.

## **6) Assessment:**

- A designated faculty member in each unit will coordinate and facilitate the



activities of the learner, monitor progress, provide feedback and review the log book/ case record.

- The log book/ case record must include the written case record prepared by the learner including relevant investigations, treatment and its rationale, hospital course, family and patient discussions, discharge summary etc.
- The log book shall also include records of outpatients assigned. Submission of the log book/ case record to the department is required for eligibility to appear for the final examination of the subject.

## **I. Eligibility to appear for Professional examinations**

The performance in essential components of training are to be assessed, based on:

### **(a) Attendance**

- There shall be a minimum of 75% attendance in theory and 80% in practical /clinical for eligibility to appear for the examinations in that subject. In subjects that are taught in more than one phase – the learner must have 75% attendance in theory and 80% in practical in each phase of instruction in that subject. There shall be minimum of 80% attendance in family visits under Family adoption programme.
- If an examination comprises more than one subject (for e.g., General Surgery and allied branches), the candidate must have a minimum of 75% attendance in each subject including its allied branches, and 80% attendance in each clinical posting.
- Learners who do not have at least 75% attendance in the electives will not be eligible for the Third Professional - Part II examination/ NEXT.

**(b) Internal Assessment:** Internal assessment shall be based on day-to-day assessment. It shall relate to different ways in which learners participate in learning process including assignments, preparation for seminar, clinical case presentation, preparation of clinical case for discussion, clinical case study/ problem solving exercise, participation in project for health care in the community. Internal assessment shall not be added to summative assessment. However, internal assessment should be displayed under a separate column in detailed marks card.

**(c)** Learners must have completed the required certifiable competencies for that phase of training and completed the log book appropriate for that phase of training to be eligible for appearing at the final University examination of that subject.

**(d)** Regular periodic examinations shall be conducted throughout the course. There shall be no less than three internal assessment examinations in each subject of first and second professional year, and no less than two examinations in each subject of final professional





year. An end of posting clinical assessment shall be conducted for each clinical posting in each professional year.

- When subjects are taught in more than one phase, the internal assessment must be done in each phase and must contribute proportionately to final assessment. For example, General Medicine must be assessed in second Professional, third Professional Part I and third Professional Part II, independently.
- Day to day records and log book (including required skill certifications) should be given importance in internal assessment. Internal assessment should be based on competencies and skills.
- The final internal assessment in a broad clinical specialty (e.g., Surgery and allied specialties etc.) shall comprise of marks from all the constituent specialties. The proportion of the marks for each constituent specialty shall be determined by the time of instruction allotted to each.
- Learners must secure at least 50% marks of the total marks (combined in theory and practical / clinical; not less than 40% marks in theory and practical separately) for internal assessment in a particular subject in order to be eligible for appearing at the final University examination of that subject. Internal assessment marks will reflect as separate head of passing at the summative examination.
- The results of internal assessment should be displayed on the notice board within one week of the test.
- Universities shall guide the colleges regarding formulating policies for remedial measures for students who are either not able to score qualifying marks or have missed on some assessments due to any reason.

## **II. University Examinations:**

University examinations are to be designed with a view to ascertain whether the candidate has acquired the necessary knowledge, minimal level of skills, ethical and professional values with clear concepts of the fundamentals which are necessary for him to function effectively and appropriately as a Physician of the first contact. Assessment shall be carried out on an objective basis to the extent possible.

- Nature of questions shall include different types such as structured assays (Long-Answer Questions -LAQ), Short-Answer Questions (SAQ) and objective type questions (e.g. Multiple Choice Questions - MCQ). Marks for each part shall be indicated separately. MCQs shall be accorded a weightage of not more than 20% of the total theory marks. In subjects that have two papers, the learner must secure minimum 50% of marks in aggregate (both papers together) to pass.
- Practical /clinical examinations shall be conducted in the laboratories and /or hospital wards. The objective will be to assess proficiency and skills to conduct experiments, interpret data and form logical conclusion. Clinical cases kept in the examination must be common conditions that the learner may encounter as a

Physician of first contact in the community. Selection of rare syndromes and disorders as examination cases is to be discouraged. Emphasis should be on candidate's capability to elicit history, demonstrate physical signs, write a case record, analyze the case and develop a management plan.

- Viva/oral examination should assess approach to patient management, emergencies, and attitudinal, ethical and professional values. Candidate's skill in interpretation of common investigative data, X-rays, identification of specimens, ECG, etc. is to be also assessed.

**University Examinations shall be held as under:**

**(a) First Professional**

The first Professional examination shall be held at the end of first Professional training (in the 12<sup>th</sup> month of that training), in the subjects of Anatomy, Physiology and Biochemistry.

**(b) Second Professional**

The second Professional examination shall be held at the end of second professional training (12<sup>th</sup> month of that training), in the subjects of Pathology, Microbiology, and Pharmacology.

**(c) Third Professional**

- Third Professional Part I examination shall be held at end of third Professional part I of training (12th month of that training) in the subjects of Community Medicine, and Forensic Medicine including Toxicology
- Third Professional Part II / National Exit Test (NExT) as per NExT regulations- (Final Professional) examination shall be at the end of 17th / 18th month of that training, in the subjects of General Medicine, General Surgery, Ophthalmology, Otorhinolaryngology, Obstetrics & Gynecology, and Pediatrics, and allied subjects as per NExT REGULATIONS.



**Note:**

- At least one question in each paper of each PHASE shall test the knowledge, and competencies acquired during the professional development programme (AETCOM module).
- Skills competencies acquired during the Professional Development Programme (AETCOM module) shall be tested during clinical, practical and viva.

**In subjects that have two papers, the learner must secure** minimum 50% of marks in aggregate (both papers together) to pass in the said subject

**Criteria for passing in a subject:** A candidate shall obtain 50% marks in University conducted examination separately in Theory and in Practical (practical includes: practical/ clinical and viva voce) in order to be declared as passed in that subject.

**Appointment of Examiners**

- Person appointed as an examiner in the particular subject must have at least four years of total teaching experience as Assistant Professor after obtaining postgraduate degree in the subject in a college affiliated to a recognized medical college (by UGMEB of NMC).
- For Practical /Clinical examinations, there shall be at least four examiners for every learner, out of whom not less than 50% must be external examiners. Of the four examiners, the senior-most internal examiner shall act as the Chairman and coordinator of the whole examination programme so that uniformity in the matter of assessment of candidates is maintained.
- A University having more than one college shall have separate sets of examiners for each college, with internal examiners from the concerned college. External examiner may be from outside the college/ University/ state/ union territory.
- There shall be a Chairman of the Board of paper-setters who shall be an internal examiner and shall moderate the questions.
- All eligible examiners with requisite qualifications and experience can be appointed internal examiners by rotation in their subjects.
- All theory paper assessment should be done as central assessment program (CAP) of the concerned University.
- Internal examiners shall be appointed from the same institution for unitary examination in the same institution. For pooled examinations at one centre, the approved internal examiners from same University may be appointed.
- There shall be no grace marks to be considered for passing in an examination.

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### AETCOM Competencies for First MBBS

Subject	Competency Number	Competency
Anatomy	Module 1.5	The cadaver as our first teacher Demonstrate respect and follow the correct procedure when handling cadavers and other biologic tissue
	Module 1.1	Identify, discuss Physician's role and responsibility to society and the community that he serves
Physiology	Module 1.2, Module 1.3	Demonstrate empathy in patient encounters
	Module 1.4	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner
Biochemistry	Module 1.1,	Enumerate and Describe the role of a Physician in health care system
	Module 1.1	Describe and discuss the commitment to lifelong learning as an important part of Physician growth



## AETCOM Competencies for Second MBBS

Subject	Competency Number	Competency
Pathology	2.6	Identify, discuss and define medico-legal, socio-cultural and ethical issues as they pertain to refusal of care including do not resuscitate and withdrawal of life support.
	2.4 A	Demonstrate ability to work in a team of peers and superiors.
	2.4 B	Demonstrate respect in relationship with patients, fellow team members, superiors and other health care workers.
	2.7	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures.
Microbiology	Module 2.2 A	Describe and discuss the role of non-maleficence as a guiding principle in patient care
	Module 2.2 B	Describe and discuss the role of autonomy and shared responsibility as a guiding principle in patient care
	Module 2.2 C	Describe and discuss the role of beneficence of a guiding principle inpatient care
	Module 2.2 D	Describe and discuss the role of a Physician in health care system
	Module 2.2 E	Describe and discuss the role of justice as a guiding principle in patient Care
	Module 2.3	Describe and discuss the role of justice as a guiding principle in patient care
	Module 2.5	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to patient autonomy, patient rights and shared responsibility in health care
Pharmacology	Module 2.1	Demonstrate ability to communicate to patients in a patient, respectful, non-threatening, non-judgmental and empathetic manner.
	Module 2.8	Demonstrate empathy in patient encounters.



### AETCOM Competencies for Third Year (Part I)

Subject	Competency Number	Competency
Ophthalmology	3.1	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.2	Demonstrate an understanding of the implications and the appropriate procedure and response to be followed in the event of medical error
(Oto-Rhino-Laryngology(ENT)	3.3 A	Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	3.3 B	Identify, discuss and defend, medico-legal, socio-cultural and ethical issues as they pertain to consent for surgical procedures
Forensic Medicine & Toxicology	3.3 C	Administer informed consent and appropriately address patient queries to a patient undergoing a surgical procedure in a simulated environment
	3.4	Identify, discuss and defend medico-legal, socio-cultural and ethical issues as it pertains to confidentiality in patient care
Community Medicine	3.5 A	Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues as it pertains to the physician - patient relationship (including fiduciary duty)
	3.5 B	Identify and discuss physician's role and responsibility to society and the community that she/ he serves





## AETCOM Competencies for Third Year (Part II)

Subject	Competency Number	Competency
Medicine and Allied Subjects	4.1 A	The student should be able to: Demonstrate ability to communicate to patients in a patient, respectful, nonthreatening, non-judgmental and empathetic manner
	4.1 B	The student should be able to: Communicate diagnostic and therapeutic options to patient and family in a simulated environment
	4.3	The student should be able to: Identify and discuss medico-legal, socio-economic and ethical issues as it pertains to organ donation
Surgery and Allied Subjects	4.4 A	The student should be able to: Demonstrate empathy in patient encounters
	4.4 B	The student should be able to: Communicate care options to patient and family with a terminal illness in a simulated environment
	4.5	The student should be able to: Identify and discuss and defend medico-legal, socio-cultural, professional and ethical issues in physician - industry relationships
	4.6	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
Obstetrics and Gynecology	4.2	The student should be able to: Identify, discuss and defend medico-legal, socioeconomic and ethical issues as it pertains to abortion / Medical Termination of Pregnancy and reproductive rights
	4.7	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts
	4.8 A	The student should be able to: Identify conflicts of interest in patient care and professional relationships and describe the correct response to these conflicts.
	4.8 B	The student should be able to: Demonstrate empathy to patient and family with a terminal illness in a simulated environment.
Pediatrics	4.9 A	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to medical negligence
	4.9 B	The student should be able to: Identify, discuss and defend medico-legal, socio-cultural, professional and ethical issues pertaining to malpractice



**Table1: Time distribution of MBBS Programme & Examination Schedule**

**Academic Calendar for CBME 2023-24 Batch**

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2023								1	2	3	4	5
2024	6	7	8	9	10	11	12-1 <sup>st</sup> Prof exam, result	13-2 <sup>nd</sup> MBBS	14	15	16	17
2025	18	19	20	21	22	23	24-2 <sup>nd</sup> Prof exam, result	25-Final 1 <sup>st</sup>	26	27	28	29
2026	30	31	32	33	34	35	36-Final 1 <sup>st</sup> exam, result	37-Final 2 <sup>nd</sup>	38	39	40	41
2027	42	43	44	45	46	47	48	49	50	51	52	53 Final Exam/NExT
2028	54 NExT	1-CRMI	2	3	4	5-2 <sup>nd</sup> NExT	6	7	8	9	10	11
2029	12 NExT											

**Legends:**

**AETCOM:** Attitude, Ethics and Communication skills

**FAP:** Family Adoption Programme (village outreach)

**SDL:** Self Directed Learning

**SGL:** Small Group Learning (tutorials/ Seminars/ Integrated Learning)

**Note :** NExT shall be as per NExT Regulations

**Table2: Distribution of subjects in each Professional Phase**

Phase & year of MBBS training	Subjects & Teaching Elements	Duration (months)	University Examination
First Professional MBBS	(i) Foundation course -1 week, remaining spread over 6 months at the discretion of college. (ii) Anatomy, Physiology & Biochemistry, Introduction to Community Medicine, Family adoption programme (FAP) through village outreach (iii) Medicine, Humanities. (iv) Early Clinical Exposure. (v) Attitude, Ethics, and communication Module (AETCOM)	12 months	1 <sup>st</sup> professional
Second Professional MBBS	(i) Pathology, Microbiology, Pharmacology (ii) Introduction to clinical subjects (iii) Clinical postings, Family visits for FAP (iv) AETCOM	12 months	2 <sup>nd</sup> professional
Third Professional part 1, MBBS, including Electives 1 month	(i) Community Medicine, Forensic Medicine and Toxicology, Medicine & allied, Surgery & allied, Pediatrics and Obstetrics & Gynecology. (ii) Family visits for FAP (iii) Clinical postings (iv) AETCOM (v) Electives- 1 month, 2 blocks, 15 days each	12 months	Final professional- Part 1
Third Professional part 2, MBBS	(i) General Medicine, Dermatology, Psychiatry, Respiratory medicine, Pediatrics, General Surgery, Orthopedics, Otorhinolaryngology, Ophthalmology, Radiodiagnosis, Anesthesiology, Obstetrics & Gynecology (ii) Clinical postings (iii) AETCOM	18 months	Final Professional- Part II





**Table 3: Foundation Course**

(one week + spread over 6 months at the discretion of college)

<b>Subjects/Contents</b>	<b>Teaching hours</b>
Orientation	30
Skills Module	34
Field visit to Community Health Center	08
Introduction to Professional Development & AETCOM module	40
Sports, Yoga and extra-curricular activities	16
Enhancement of language/computer skills	32
<b>Total</b>	<b>160</b>



**Table No. 4 - Distribution of Subject Wise Teaching Hours for 1<sup>st</sup> MBBS**

Subject	Lectures	SGL	SDL	Total
Foundation Course	-	-	-	39
Anatomy	210	400	10	620
Physiology*	130	300	10	440
Biochemistry	78	144	10	232
Early Clinical Exposure**	27	-	-	27
Community Medicine	20	20	-	40
FAP	-	-	27	27
(AETCOM)***	-	26	-	26
Sports and extra-curricular activities	-	-	-	10
Formative Assessment and Term examinations	-	-	-	60
<b>Total</b>	<b>464</b>	<b>918</b>	<b>30</b>	<b>1521 #</b>

- Including Molecular Biology

\*\* Early Clinical exposure hours to be divided equally in all three subjects.

\*\*\*AETCOM module shall be a longitudinal programme.

# Includes hours for Foundation course also



**Table No. 5 - Distribution of Subject Wise Teaching Hours for II MBBS**

<b>Subjects</b>	<b>Lectures</b>	<b>SGL</b>	<b>Clinical Postings*</b>	<b>SDL</b>	<b>Total</b>
Pathology	80	165	-	10	255
Pharmacology	80	165	-	10	255
Microbiology	70	135	-	10	215
Community Medicine	15	0	0	10	25
FAP	0	0	30	-	30
Forensic Medicine and Toxicology	12	22	-	08	42
Clinical Subjects	59	-	540	-	599
AETCOM	-	29	-	8	37
Sports and extra-curricular activities	-	-	-	20	35
Pandemic module				28	28
<b>Final total</b>	<b>316</b>	<b>516</b>	<b>585</b>	<b>104</b>	<b>1521</b>

*Note : Clinical postings shall be for 3 hours per day, Monday to Friday.*

*There will be 15 hours per week for all clinical postings.*





**Table No. 6 - Distribution of Subject Wise Teaching Hours for Final MBBS part 1**

<b>Subject</b>	<b>Lectures</b>	<b>SGL</b>	<b>SDL</b>	<b>Total</b>
Electives	0	156	0	156
Gen. Med.	30	50	10	90
Gen Surgery	30	50	10	90
Obs. & Gyn	30	50	10	90
Pediatrics	25	30	10	65
Ortho+ PMR	15	20	10	45
For. Med.& Tox.	40	70	20	130
Community Med	55	70	20	145
FAP (Visits +log book submission)	-	21	10	31
Otorhinolaryngology (ENT)	15	20	10	45
Ophthalmology	15	20	10	45
Clinical posting	-	-	540	540
AETCOM	0	19	12	31
Pandemic module	18	0	0	18
<b>Total</b>	<b>273</b>	<b>546</b>	<b>672</b>	<b>1521</b>



**Table 7: Distribution of Subject wise Teaching Hours for**  
**Third professional part-2/ Final MBBS**

<b>Subjects</b>	<b>Lectures</b>	<b>SGL</b>	<b>SDL</b>	<b>Total</b>
General Medicine	80	140	40	<b>260</b>
General Surgery	80	140	40	<b>260</b>
Obstetrics and Gynecology	80	140	40	<b>260</b>
Pediatrics	30	60	30	<b>120</b>
Orthopedics + Phys. Med. Rehab	25	35	25	<b>85</b>
AETCOM	30	0	22	<b>52</b>
Dermatology	15	10	15	<b>40</b>
Psychiatry	15	15	15	<b>45</b>
Respiratory Medicine	15	15	15	<b>45</b>
Otorhinolaryngology (ENT)	15	25	15	<b>55</b>
Ophthalmology	15	25	15	<b>55</b>
Radiodiagnosis +RT	8	15	15	<b>38</b>
Anesthesiology	8	15	15	<b>38</b>
Pandemic module	28	-	-	<b>28</b>
<b>TOTAL</b>	<b>444</b>	<b>610</b>	<b>302</b>	<b>1356</b>

**Extra time for SDL/preparation for NExT**

**Table No. 8: Clinical Posting Schedules in weeks**

Subjects	Period of training in weeks			Total Weeks
	II MBBS	III MBBS Part I	III MBBS Part II	
Electives	0	4	0	4
General Medicine	7	4	10	21
General Surgery	7	4	10	21
Obstetrics & Gynaecology	7	4	10	21
Pediatrics	4	4	5	13
Community Medicine	4	4	0	8
Orthopaedics, PMR, Trauma	2	2	4	8
Otorhinolaryngology	0	3	4	7
Ophthalmology	0	3	4	7
Respiratory Medicine	0	0	3	3
Psychiatry	0	2	4	6
Radio-diagnosis	0	0	2	2
Dermatology	2	2	2	6
Dentistry	1	0	0	1
Anaesthesiology	0	0	3	3
Emergency Medicine	2	0	1	3
<b>Total</b>	<b>36</b>	<b>36</b>	<b>62</b>	<b>134</b>





**Table 9: Learner- Doctor programme (Clinical Clerkship)**

<b>Year of Curriculum</b>	<b>Focus of Learner-Doctor programme</b>
Year 1	Introduction to hospital environment, early clinical exposure, understanding perspectives of illness, Family Adoption Program(FAP)
Year 2	History taking, physical examination, assessment of change in clinical status, communication and patient education, FAP
Year 3	All of the above and choice of investigations, basic procedures and continuity of care
Year 4	All of the above (except FAP) and decision making, management and outcomes



**Table 10 : Marks distribution for various subjects for University Annual Examinations**

Phase of Course	Theory	Practicals	Passing criteria
<b>1<sup>st</sup> MBBS</b>			
Anatomy- 2 papers	Paper 1- 100	100	Mandatory to get 50% marks separately in theory and in practicals.  For theory, papers 1 and 2 for the same subject, aggregate of 50% in both papers.
	Paper 2 -100		
Physiology- 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Biochemistry- 1 paper	Paper 1- 100	50	
<b>2<sup>nd</sup> MBBS</b>			
Pathology - 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Microbiology- 1 paper	Paper 1- 100	50	
Pharmacology- 2 papers	Paper 1 -100	100	
	Paper 2- 100		
<b>Final MBBS part 1</b>			
Forensic Med. Tox.- 1 paper	Paper 1 - 100	50	
Community Med- 2 papers	Paper 1 -100	100	
	Paper 2- 100		

**For NEXT, as per NEXT regulations.**

**GUIDELINES FOR MANPOWER REQUIREMENT FOR RESEARCH FACILITIES  
IN A MEDICAL COLLEGE**

Research labs can be under following categories:

1. Molecular lab
2. Stem cell research lab
3. Cytogenetics
4. HLA and tissue typing research lab

Applied Clinical research for organ perfusion, cancer research, in vitro fertilization, etc. can be under any of the above research facilities.

**MAN POWER:**

**(1) Lab Director** : **1(One) Post**

Minimum Qualifications required :

- (i) MD Path/MD Microbiology/MD Transfusion Medicine/MD Biochemistry.
- (ii) Faculty with PhD (Medical subject will be preferred)

Lab work : 10 years experience

Lab research related publications : Minimum 10 in last 10 years

**(2) Lab Supervisor** : **1(One) Post (per research facility)**

Minimum Qualifications required:

- (i) MD Path/ MD Microbiology/MD Transfusion Medicine/MD Biochemistry
- (ii) Faculty with Ph.D. ( Medical subject) will be preferred, or M.Sc. in life sciences with PhD from Medical college.

Lab work : 7 years experience

Lab research related publications : Minimum 5 in last 5 years

**(3) Senior Scientific Research Officer** : **1(One) Post or more (per research facility)**





- Minimum Qualifications required :
- (i) PhD with MD Path/MD Microbiology/MD Transfusion Medicine/MD Biochemistry/PhD in medical college or MSc in life sciences with PhD from medical college
- Lab work : 4 years experience
- Lab research related publications : Minimum 3 in last 3 years
- (4) **Junior Research Officer** : 1(One) or more (per research facility)
- Minimum Qualifications required :
- (i) MD Path/ MD Microbiology/ MD Transfusion Medicine/MD Biochemistry or Diploma in Clinical Pathology/ M.Sc. in Life Sciences, Ph.D. scholar/ Postdoc fellow
- (ii) Diploma holder in any branch may pursue PhD if experience / research inclinations proved for minimum of 1 year. They can be enrolled for integrated Master's PhD course.
- Lab work : 1 year experience
- Lab research related publications : preferably 1 in last 2 years
- (5) **Laboratory Technicians** : **Minimum 2(two) Posts**
- Minimum Qualifications required :
- (i) B.Sc./M.Sc. in Life Sciences including Biotechnology,
- (ii) DMLT
- (6) **Data entry operator/ Clerk** : Minimum 1(One)



- |                                                                   |   |                                             |
|-------------------------------------------------------------------|---|---------------------------------------------|
| Minimum Qualifications required                                   | : |                                             |
| Experience                                                        | : |                                             |
| <b>(7) Store keeper</b>                                           | : | <b>Minimum 1(One)</b>                       |
| Minimum Qualifications required                                   | : |                                             |
| Experience                                                        | : |                                             |
| <b>(8) Biostatistician</b>                                        | : | <b>Minimum 1(One)</b>                       |
| Minimum Qualifications required                                   | : |                                             |
| Experience                                                        | : |                                             |
| <b>(9) Lab attendant</b>                                          | : |                                             |
| <b>(10) Peon/ Multi-task worker</b>                               | : |                                             |
| <b>(11) Clinical Monitors</b>                                     | : |                                             |
|                                                                   |   | Any MBBS or above with research inclination |
| <b>(12) Social worker/ MSW with applied research inclinations</b> |   |                                             |



**NATIONAL MEDICAL COMMISSION (UNDERGRADUATE MEDICAL  
EDUCATION) GUIDELINES, 2023**

**CURRICULUM FOR FAMILY ADOPTION PROGRAMME**

**FAMILY ADOPTION PROGRAM:**

This is being introduced with the aim of village outreach program for MBBS students. Every college may arrange one diagnostic medical camp in the village wherein identification of:

- a) anaemia, malnutrition in children, hypertension, diabetes mellitus, ischemic heart diseases, kidney diseases, any other local problems may be addressed.
- b) If required, patients shall be admitted in the hospital for acute illness under care of student, charges may be waived off or provide concession or govt. schemes.
- c) For chronic illness, students shall be involved.
- d) Subsidized treatment charges may be provided under govt. schemes or welfare schemes.
- e) Medical student may be allocated about 5 families and introduced in the first visit.
- f) Camps may be arranged by Dean and Community Medicine/ P.S.M. department with active involvement of Associate/ Asst. Professors, social worker and supporting staff. Local population may be involved with village leaders.
- g) Visit by students be made to the visit as mentioned in table below. Annual follow up diagnostic camp can be continued by the PSM department.

**TARGETS TO BE ACHIEVED BY STUDENTS:**

**First Professional Year:**

- a) Learning communication skills and inspire confidence amongst families
- b) Understand the dynamics of rural set-up of that region
- c) Screening programs and education about ongoing government sponsored health related programs
- d) Learn to analyse the data collected from their families
- e) Identify diseases/ ill-health/ malnutrition of allotted families and try to improve the standards

**Second Professional Year**

- a) Inspire active participation of community through families allotted
- b) Continue active involvement to become the first doctor /reference point of the family by continued active interaction
- c) Start compiling the outcome targets achieved

**Third Professional Year**

Analysis of their involvement and impact on existing socio-politico-economic dynamics in addition to improvement in health conditions





**-Final visit to have last round of active interaction with families**

**-prepare a report to be submitted to department addressing:**

- 1) Improvement in general health
- 2) Immunization
- 3) Sanitation,
- 4) De-addiction
- 5) Whether healthy lifestyles like reading good books, sports/ yoga activities have been inculcated in the house-holds.
- 6) Improvement in anaemia, tuberculosis control
- 7) Sanitation awareness
- 8) Any other issues
- 9) Role of the student in supporting family during illness/ medical emergency
- 10) Social responsibility in the form of environment protection programme in form of plantation drive (medicinal plants/trees), cleanliness and sanitation drives with the initiative of the medical student

### Curriculum for Family Adoption Programme

Professional Year	Competency The student should be able to	Objectives	Suggested Teaching Learning methods	Suggested Assessment methods	Teaching Hours
1 <sup>st</sup> Professional	<ul style="list-style-type: none"> <li>Collect demographic profile of allotted families, take history and conduct clinical examination of all family members</li> </ul>	By the end of this visit, students should be able to compile the basic demographic profile of allocated family members	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	6 hrs
	<ul style="list-style-type: none"> <li>Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor</li> </ul>	By the end of this visit, students should be able to report the basic health profile and treatment history of allocated family members	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	9 hrs
	<ul style="list-style-type: none"> <li>Maintain communication &amp; follow up of remedial measures</li> </ul>	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment and	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community	Community case presentation, OSPE, logbook based of competency, journal of visit	6 hrs

	<ul style="list-style-type: none"> <li>Take part in environment protection and sustenance activities.</li> </ul>	<p>suggested remedial measures</p> <p>By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village</p>	<p>clinics,</p> <p>Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences</p>	<p>logbook certification based of competency, journal of visit</p>	<p>6hrs</p> <p>( Total 27 hrs, 9 visits)</p>
2 <sup>nd</sup> Professional	<ul style="list-style-type: none"> <li>Take history and conduct clinical examination of all family members</li> <li>Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor</li> </ul>	<p>By the end of this visit, students should be able to compile the updated medical history of family members and report their vitals and anthropometry</p> <p>By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine routine and blood sugar along with treatment history of allocated family members</p>	<p>Family survey, Community clinics</p> <p>Community clinics, Multispecialty camps</p>	<p>Community case presentation, OSPE, logbook, journal of visit</p> <p>Community case presentation, OSPE, logbook, journal of visit</p>	<p>6 hrs</p> <p>9 hrs</p>

	<ul style="list-style-type: none"> <li>Maintain communication &amp; follow up of remedial measures</li> </ul>	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	9 hrs
	<ul style="list-style-type: none"> <li>Take part in environment protection and sustenance activities.</li> </ul>	By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences	logbook based certification of competency, journal of visit	6 hrs
					( Total 30 hrs, 10 visits)
3 <sup>rd</sup> Professional	<ul style="list-style-type: none"> <li>Take history and conduct clinical examination of all family members</li> </ul>	By the end of this visit, students should be able to update the medical history of family members and their vitals and anthropometry	Family survey, Community clinics	Community case presentation, OSPE, logbook, journal of visit	3hrs
	<ul style="list-style-type: none"> <li>Organize health check-up and coordinate treatment of adopted family under overall guidance of mentor</li> </ul>	By the end of this visit, students should be able to report the details of clinical examination like Hb %, blood group, urine	Community clinics, Multispecialty camps	Community case presentation, OSPE, logbook, journal of visit	3hrs



		routine and blood sugar along with treatment history of allocated family members			
	<ul style="list-style-type: none"> <li>Maintain communication &amp; follow up of remedial measures</li> </ul>	By the end of this visit, students should be able to provide details of communication maintained with family members for follow-up of treatment, and suggested remedial measures along with details of vaccination drive	Reporting of follow up visits, PRA techniques (transact walk, group discussion) Community clinics,	Community case presentation, OSPE, logbook based certification of competency, journal of visit	3hrs
	<ul style="list-style-type: none"> <li>Take part in environment protection and sustenance activities.</li> <li>Council the family members of allotted families and analyze the health trajectory of adopted family under overall guidance of mentor</li> </ul>	<p>By the end of this visit, students should be able to report the activities undertaken for environment protection and sustenance like study of environment of families, tree plantation/ herbal plantation activities conducted in the village,</p> <p>By the end of this visit, students should be able to analyze and report the health trajectory of adopted family along with remedial measures adopted at individual, family and community level</p>	Participation in and Process documentation of activities (NSS activities) along with reporting of photographic evidences, Small group discussion (report of the health trajectory of adopted family)	logbook based certification of competency, journal of visit	3hrs
					( total 21 hrs, 7 visits)

## **LOG BOOK FOR FAMILY ADOPTION**

**COLLEGE NAME** :

**UNIVERSITY** :

**ADDRESS DETAILS** :

**NAME OF THE STUDENT** :

**ROLL NO.** :

**VILLAGE NAME** :

**TEHSIL/ DISTRICT** :

**STATE/ UNION TERRITORY** :

**NAME OF THE MENTOR** :

**MENTOR STATUS** :

Asst. Prof/ S.R. And Details  
(If changed, details of subsequent  
mentors)

**NAME OF ASHA WORKER** :

**ADDRESS OF ASHA WORKER** :

**EXPERIENCE** :

(SINCE HOW MANY YEARS IS HE/ SHE EMPLOYED)

(SEPARATE PAGE FOR EACH FAMILY BE MAINTAINED)

- Family name and address
- Approximate size of living space of house-hold
- Malaria/ flu/ etc pertinent to the region

- 1) If there is any illness or medical emergency required by the house-hold, the student should take initiative in being the primary contact for the family.
- 2) The student in turn should consult his/her mentor for further management of the patient.
- 3) The hospital to which the college is attached must provide treatment facilities to the patient.
- 4) Government schemes may be utilized for optimal management.
- 5) Follow-up records must be maintained by the student. These must be periodically evaluated by mentors with the help of senior residents.
- 6) The entire data sheet may be prepared by every student and submitted by the end of 6<sup>th</sup> semester for evaluation.
- 7) Progress notes must include every demographic point and history recorded.



# Appendix "H - I"

## Guidelines regarding admission of students with "Specified Disabilities" under the Rights of Persons with Disabilities Act, 2016 with respect to admission in MBBS Course.

- Note : 1. The "Certificate of Disability" shall be issued in accordance with the Rights of Persons with Disabilities Rules, 2017 notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 15th June 2017.
2. The extent of "specified disability" in a person shall be assessed in accordance with the "Guidelines for the purpose of assessing the extent of specified disability in a person included under the Rights of Persons with Disabilities Act, 2016 (49 of 2016)" notified in the Gazette of India by the Ministry of Social Justice and Empowerment [Department of Empowerment of Persons with Disabilities (*Divyangjan*)] on 4th January 2018.
3. The minimum degree of disability should be 40% (Benchmark Disability) in order to be eligible for availing reservation for persons with specified disability.
4. The term 'Persons with Disabilities' (PwD) is to be used instead of the term 'Physically Handicapped' (PH).

S. No.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
1.	Physical Disability	A. Locomotor Disability, including Specified Disabilities(a to f).	a. Leprosy cured person*	Less than 40% disability	40-80% disability Persons with more than 80% disability may also be allowed on case to case basis and their functional competency will be determined with the aid of assistive devices, if it is being used, to see if it is brought below 80% and whether they possess sufficient motor ability as required to pursue and complete the course satisfactorily.	More than 80%
			b. Cerebral Palsy**			
			c. Dwarfism			
			d. Muscular Dystrophy			
			e. Acid attack victims			
			f. Others*** such as Amputation, Poliomyelitis, etc.			
			<p>* Attention should be paid to loss of sensations in fingers and hands, amputation, as well as involvement of eyes and corresponding recommendations be looked at</p> <p>** Attention should be paid to impairment of vision, hearing, cognitive function etc. and corresponding recommendations be looked at.</p> <p>*** (i) Both hands intact, with intact sensations, sufficient strength and range of motion are essential to be considered eligible for medical course.</p> <p>(ii) Movement of the upper limb with respect to all the joints (shoulder, elbow, forearm, wrist and all fingers) to be considered – full power, intact, in the dominant upper limb is necessary.</p> <p>(iii) For non-dominant upper limb, power of 4/5 or above is recommended.</p>			
		B. Visual Impairment (*)	a. Blindness	Less than 40% disability	-	Equal to or More than 40% Disability
			b. Low vision			
		C. Hearing impairment@	a. Deaf	Less than 40% Disability	-	Equal to or more than 40% Disability
			b. Hard of hearing			
		<p>(*) Persons with Visual impairment / visual disability of equal to or more than 40% may be made eligible to pursue MBBS Course and may be given reservation, subject to the condition that the visual disability is brought to a level of less than the benchmark of 40% with advanced low vision aids such as telescopes / magnifier etc.</p> <p>@Person with hearing disability of more than 40% may be made eligible to pursue MBBS Course and may be given reservation subject to condition that the hearing disability is brought to a level of less than the bench mark of 40% with the aid of assistive devices/cochlear implants (CI).</p> <p>In addition to this, the individual should have speech discrimination score of more than 60%</p>				



	Type of Disabilities	Disability Range				
		Specified Disability	Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course	
	D. Speech & language disability\$	Organic/ neurological calcauses	Less than 40% Disability	-	Equal to or more than 40% Disability	
	\$ Persons with Speech Intelligibility Affected (SIA) shall be eligible to pursue MBBS Courses, provided Speech Intelligibility Affected (SIA) score shall not exceed 3 (three), which is 40% or below. Persons with Aphasia shall be eligible to pursue MBBS Courses, provided Aphasia Quotient (AQ) is 40% or below.					
2.	Intellectual disability	a. Specific learning disabilities (Perceptual disabilities, Dyslexia, Dyscalculia, Dyspraxia & Developmental aphasia)#	# currently there is no Quantification scale available to assess the severity of SpLD, therefore the cut-off of 40% is arbitrary and more evidence is needed.	Less than 40% Disability	Equal to or more than 40% disability and equal to or less than 80%. But selection will be based on the learning competency evaluated with the help of the remediation/assisted technology/aids/infrastructural changes by the Expert Panel.	More than 80% or severe nature or significant cognitive/intellectual disability.
		b. Autism spectrum disorders	Absence or Mild Disability, Asperger syndrome (disability of upto 60% as per ISAA) where the individual is fit for MBBS course by an expert panel.	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.	More than 60% disability or presence of cognitive/intellectual disability and/or if the person is unfit for pursuing MBBS course by an expert panel.	
3.	Mental behavior	Mental illness	Absence or mild Disability; less than 40% (under IDEAS)	Currently not recommended due to lack of objective method to establish presence and extent of mental illness. However, the benefit of reservation/quota may be considered in future after developing better methods of disability assessment.  According to the Notification dated 09.12.2020 by the Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice, a diagnosis of SLD using NIMHANS SLD Battery should be equated to more than 40% disability. Any person with SLD and more than 40% disability should be allowed to complete on par with other PwDs under the reservation quota for PwDs.	Equal to or more than 40% disability or if the person is unfit to perform his/her duties. Standards may be drafted for the definition of "fitness to practice medicine" as are used by several institutions of countries other than India.	

4.	Disability Type	Type of Disabilities	Specified Disability	Disability Range		
				Eligible for Medical Course, Not Eligible for PwD Quota	Eligible for Medical Course, Eligible for PwD Quota	Not Eligible for Medical Course
	Disability caused due to	a. Chronic Neurological Conditions	i. Multiple Sclerosis	Less than 40% Disability	40-80% disability	More than 80%
			ii. Parkinsonism			
		b. Blood Disorders	i. Haemophilia	Less than 40% Disability	40-80% disability	More than 80%
			ii. Thalassemia			
			iii. Sickle cell disease			
5.	Multiple disabilities including deaf		More than one of the abovespecified disabilities	Must consider all above while deciding in individual cases recommendations with respect to presence any of the above, namely, Visual, Hearing, Speech & Language disability, Intellectual Disability, and Mental Illness as a component of Multiple Disability. Combining Formula as notified by the related Gazette Notification issued by the Govt. of India $a + \frac{b(90-a)}{90}$ (where a= higher value of disability % and b=lower value of disability % as calculated for different disabilities) is recommended for computing the disability arising when more than one disabling condition is present in a given individual. This formula may be used in cases with multiple disabilities, and recommendations regarding admission and/or reservation made as per the specific disabilities present in a given individual		

(NMC Format)  
1<sup>st</sup> year MBBS Student admission in College for the Year...

Name of the Medical College:

1	S.NO.	
2	State	
3	College name	
4	Merit no.	
5	Name of Students	
6	Gender	
7	Physically Handicapped	
8	Date of Birth	
9	Category	
10	Sub-category	
11	Marks obtained/ maximum marks in 10+2 (PCB)	
12	PCB percentage	
13	Marks obtained /maximum marks in 10+2 (English)	
14	English Percentage	
15	Marks obtained/Maximum marks in NEET Entrance Exam	
16	NEET Entrance Exam Percentage	
17	Date of Admission	
18	NEET Roll No.	
19	Fees Charged	

*[Handwritten Signature]*



Faculty : MBBS Year/Phase-

# DEPARTMENT OF Anatomy/Physiology/Biochemistry

		Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
S.No.	Roll No.	1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Self Directed Learning		Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)
		100	100	200	15	15	30	15	15	10	500	%	Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination
1													
2													
3													

Note: Minimum 40% separately for theory and practical and 50% cumulative in 1A for eligibility in Summative examination

S/d  
Professor & Head  
Department of \_\_\_\_\_  
\*Medical College,  
Univ.  
State/ U.T.

Faculty : MBBS Year/Phase-

Department of Anatomy/Physiology/Biochemistry

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)								
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)					Journal (Record book/Portf	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other	FAP competencies	AETCOM competencies	SVL Lab activity					
			100	100	100	70	10	30	40	40	10	500	%	
1														
2														
3														

S/d  
Professor & Head  
Department of \_\_\_\_\_  
\*\*Medical College  
University, State/ U.T.

Faculty : MBBS Year/Phase-

## Department OF Patho/Pharmac/Microbiology

			Formative Assessment_Theory										Continuous Internal assessment_Theory										Cumulative percent of Theory & Practical			
S.No.	Roll No.	Name of Student	1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study		Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)											
									Self Directed Learning																	
			100	100	200	15	15	30	15	15	10	500	%													
1																										
2																										
3																										

S/d

Professor & Head

Department of \_\_\_\_\_

College,

Univ.,

State/U.T.



Faculty : MBBS

Year/Phase-

## Department of Patho/Pharmac/Microbiology

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)							
			1st PCT Practical/First Ward leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			FAP	Journal (Record book)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity					
			100	100	100	60	30	40	20	40	10	500	%
1													
2													
3													

S/d  
Prof. , HOD,  
College,  
Univ.,  
State/ U.T.



# DEPARTMENT OF FORENSIC MEDICINE AND TOXICOLOGY

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 375+500= 875 (Minimum cut off 50%)
1			100	100	100	10	10	25	10	10	10	375	%	
2														
3														

S/d  
Professor & Head  
Department of \_\_\_\_\_  
\* Medical College  
University  
State/  
U.T.



Faculty : MBBS

Year/Phase-

## DEPARTMENT OF FORENSIC MEDICINE AND TOXICOLOGY

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)						Total	Percentage Practical (Minimum cut off 40%)
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			Journal (Record book/ Portfolio)	Attendance (Practical)			
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity					
1			100	100	100	70	40	40	40	10		500	%
2													
3													

S/d

Professor &amp; Head

Department of \_\_\_\_\_

\* Medical College

University

State/ U.T.





# DEPARTMENT OF COMMUNITY MEDICINE

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+500= 1000 (Minimum cut off 50%)
														Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination
1			100	100	200	15	15	30	15	15	10	500	%	
2														
3														

S/d  
Professor & Head  
Department of \_\_\_\_\_  
\* Medical College  
University  
State/  
U.T.

Faculty : MBBS Year/Phase-

Department of Community Medicine

Date : dd/mm/yyyy

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (150)			Journal (Record book/ Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	Family Adoption Programme competencies in Comm. Med	AETCOM competencies				
1			100	100	100	60	30	30	40	10	500	%
2												
3												

S/d

Professor & Head

Department of

\* Medical College

University

State/ U.T.

# DEPARTMENT OF Medicine, Surgery, OBGY

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off 40%)	Theory+ Practical = 500+650= 1150 (Minimum cut off 50%)
			100	100	200	15	15	30	15	15	10	500	%	Note: Minimum 40% separately for theory and practical and 50% cumulative in IA for eligibility in Summative examination
1														
2														
3														

S/d

Professor & Head

Department of \_\_\_\_\_

\* Medical College, University

State/ U.T.





# DEPARTMENT OF Medicine, Surgery, OBGY

S.No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (200)			Journal (Record book/Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity				
1			100	100	200	100	50	50	40	10	650	%
2												
3												

S/d  
 Professor & Head  
 Department of \_\_\_\_\_  
 \*Medical College  
 University  
 State/ U.T.

DEPARTMENT OF PAEDIATRICS, OPHTHALMOLOGY, OTORHINOLARYNGOLOGY (ENT)

Faculty : MBBS Year/Phase-

DEPARTMENT OF Paediatrics/ Ophthalm/ ENT

S.No.	Roll No.	Name of Student	Formative Assessment_Theory			Continuous Internal assessment_Theory						Cumulative percent of Theory & Practical		
			1st PCT Theory	2nd PCT Theory	Prelims Theory (Paper I & II)	Home Assignment	Seminar	Continuous Class Test (LMS)	Museum study	Library assignments	Attendance Theory	Total	Percentage Theory (Minimum cut off %)	Theory+ Practical = 375+500= 875 (Minimum cut off 50%)
			100	100	100	10	10	25	10	10	10	375		
1														
2														
3														



**Department of Paediatrics/ Ophthalm/ ENT**

S. No.	Roll No.	Name of Student	Formative Assessment			Continuous Internal Assessment (Practical)						
			1st PCT Practical/First Ward Leaving Examination	2nd PCT Practical /Second Ward Leaving Examination	Prelims Practical	Log book (200)			Journal (Record book/Portfolio)	Attendance (Practical)	Total	Percentage Practical (Minimum cut off 40%)
						Certifiable skill based competencies (Through OSPE/OSCE/Spots/Exercise/Other)	AETCOM competencies	SVL Lab activity				
1			100	100	200	100	50	50	40	10	650	%
2												
3												

*[Signature]*

S/d  
**Professor & Head**  
 Department of \_\_\_\_\_  
 \*Medical College  
 University  
 State/ U.T.



## CHAPTER - I

# Regulations for Post Graduate Degree Courses in Medical Sciences

1. **Branches of Study :** Postgraduate Degree Courses The following courses of studies may be pursued.

### Pre-Clinical

1. Anatomy
2. Physiology
3. Biochemistry

and such other subjects which may be introduced in future from time to time and recognized by National Medical Commission.

### Para-Clinical

1. Pharmacology
2. Pathology
3. Microbiology
4. Forensic Medicine & Toxicology

and such other subject which may be introduced in future from time to time and recognized by National Medical Commission.

**Goal :** The goal of post-graduate medical education shall be to produce competent specialist and medical teachers recognised by the fraternity as the graduating scholars, building upon their undergraduate education and skills who shall –

- i. Recognise the health needs of the community and carry out professional obligations ethically keeping in view the objectives of the national health policy;
- ii. Have mastered most of the competencies, pertaining to the respective speciality, that is required to be practised at the secondary and the tertiary levels of the health care delivery system;
- iii. Be aware of the contemporary advancements and developments in the respective discipline concerned and shall progress accordingly

- iv. Have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology;
- v. Have acquired the basic skills in the teaching of medical and paramedical professionals;
- vi. Acquire basic management skills in human resources, materials and resource management related to health care delivery, general hospital management, principal inventory skills and counselling; vii. Develop personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals; viii. Become an exemplary citizen by observing the highest standards of professional ethics and working towards fulfilling social and professional obligations to respond to national aspirations.

#### **General Objectives**

At the end of the postgraduate training in the discipline concerned the student shall be able to:

- i) Recognize the importance of the concerned speciality in the context of the health need of the community and the national priorities in the health sector.
- ii) Practice the speciality concerned ethically and in step with the principles of primary health care.
- iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic rehabilitative, preventive and promotive measures/ strategies.
- v) Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- vi) Plan and advise measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
- vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
- viii) Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the social norms and expectations.
- ix) Play the assigned role in the implementation of national health programmes, effectively and responsibly.
- x) Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- xi) Develop skills as a self-directed learner, recognize continuing educational needs and use appropriate learning resources.
- xii) Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
- xiii) Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- xiv) Function as an effective leader of a health team engaged in health care, research or training.

### **Statement of the Competencies**

Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies, which shall be defined and spelt



out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

Components of the PG Curriculum The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical / clinical Skills
- Training in Thesis.
- Attitudes, including communication.
- Training in research methodology.

3. **Eligibility for Admission : ELIGIBILITY CRITERIA FOR SELECTION OF POSTGRADUATE STUDENTS**

- A. Students for postgraduate medical courses shall be selected strictly on the basis of their academic merit.
- B. For determining the academic merit, the university shall adopt the following procedures for degree courses:
- C. – Eligibility to pursue a post-graduate broad-speciality course in Medicine shall be as per “NMC, National Exit Test Regulations, 2023”.

Provided that until the first batch based on National Exit Test (NExT) becomes eligible for admission in broad-speciality courses, the existing system of admission through National Eligibility-cum-Entrance Test-Postgraduate (NEET-PG) as per Post-Graduate Medical Education Regulation, 2000 (PGMER-2000) shall Continue

The candidate has to make an application to the KAHER with the following documents along with the prescribed fee :

- 1 MBBS pass / degree certificate issued by the KAHER. Recognized Universities approved by NMC.
- 2 Marks cards of all the examinations passed during MBBS course.
- 3 Attempt Certificate issued by the Principal.
- 4 Certificate regarding the recognition of the medical college by the National Medical Commission.
- 5 Completion of internship certificate.
- 6 In case internship was done in a non-teaching hospital, a certificate from the National Medical Commission that the hospital has been recognized for internship.
- 7 Registration by any State Medical Council.

Candidates should obtain the Eligibility Certificate before the last date for admission as notified by the KAHER.

A candidate who has been admitted to postgraduate course should register his / her name in the KAHER within a month of admission after paying the registration fees.

4. **Intake of Students**

The intake of students to each course shall be in accordance with the NMC approval.

5. **Course of the Study**

**Duration :**

a) **M.D./M.S. Degree Courses**

The course of study shall be for a period of 3 years

**Training Programme:**

- (i) Post-graduate training shall consist of training of the students through lectures, seminars, journal clubs, group discussions, participation in laboratory and experimental work, involvement in research, clinical meetings, grand rounds, clinico-pathological conferences, practical training in the diagnosis and medical and surgical treatment, training in the basic medical sciences as well as in allied clinical specialties, etc. as per the requirement of Speciality training.
- (ii) All post-graduate students will work as full-time resident doctors. They will work for reasonable working hours and will be provided reasonable time for rest in a day.
- (iii) All broad-speciality will do thesis related research and will write thesis.
- (iv) Every institution undertaking post-graduate training programme shall set up an Academic Cell, under the Chairmanship of a senior faculty member, who shall monitor the implementation of training programmes in each speciality and ensure its quality as mandated by the PGMEB.
- (v) The training programmes shall be updated as and when required while keeping in mind the curriculum requirements and other relevant requirements prescribed by PGMEB from time to time. The structured training programme shall be written and strictly followed, to enable the examiners to determine the training undergone by the candidates.
- (vi) Post-graduate students of broad and super Speciality degree courses shall maintain a dynamic e-log book which needs to be updated on a weekly basis about the work being carried out by them and the training programme undergone during the period of training. Provided that M.S. /M.Ch students shall mandatorily enter details of surgical procedures assisted or done



independently.

- (vii) It shall be the duty of the Post-graduate guide imparting the training to assess and authenticate monthly the record (e-Log) books.
- (viii) The post-graduate students shall essentially be required to participate in the teaching and training programme of undergraduate students and interns.
- (ix) During the training for award of Degree/Diploma, there shall be proper training in basic medical sciences related to the disciplines concerned. During the training programmes emphasis has to be laid on preventive and social aspects. All post-graduate medical college/institution shall have facilities for teaching the basic science subjects as per guidelines

**(x) Course in Research Methodology –**

- a. All post-graduate students shall complete an online course NPTEL in Research Methodology.
- b. The students shall have to register on the Swayam portal.
- c. The students are expected to complete the course in the first year.
- d. The online NPTEL certificate generated on successful completion of the course and examination thereafter, will be acceptable evidence of having completed this course.
- e. The above certification shall be a mandatory requirement to be eligible to appear for the final examination of the respective post-graduate course.
- f. This requirement shall be applicable for all post-graduate students.

**(xi) Course in Ethics -**

- a. All post-graduate students shall complete course in ethics including Good Clinical Practices and Good Laboratory Practices, whichever is relevant to them, to be conducted by institutions/Universities.
- b. The students are expected to complete the course in the first year.
- c. No post-graduate student shall be permitted to appear in the examination without the above certification.

**(xii) Course in Cardiac Life Support Skills -**

a. All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institution.

b. The students are expected to complete the course in the first year.

c. No post-graduate student shall be permitted to appear in the examination without the above certification.

**6. Attendance, Progress and Conduct**

a) A candidate pursuing degree course should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course.

b) Each year shall be taken as a unit for the purpose of calculating attendance.

C) Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not be absent himself / herself from work without valid reasons.

D ) Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year

- e) Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the KAHER Examinations.

#### 7) Leave Rules for Post-graduate Students –

The following leave rules will be followed:

- a. Every post-graduate student will be given minimum 20 days of paid leave (casual leave) per year, 5 days academic leave per year. Thus a student is entitled to 52 weekly offs and 20 paid casual leaves per year.
- b. Subject to exigencies of work, post-graduate students will be allowed one weekly holiday.
- c. Female post-graduate students shall be allowed maternity leave as per existing Government rules and regulations.
- d. Male post-graduate students shall be allowed paternity leave as per existing Government rules and regulations.

- e. In addition to 20 days' paid leave, the candidates will be allowed.

f. If candidate avails leave in excess of the permitted number of days, his/her term of course shall be extended by the same number of days to complete the training period. However, one shall be able to appear in the examination if one has 80% (eighty per cent) of the attendance.

A student shall require 80% attendance on working days i.e. 751 days for appearing for exams.

- 8) **Work diary / E- Log Book**-Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. E Log book will be maintained digitally. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution and presented in the university practical/clinical examination. The log book

is thus a record of various activities by the student like: Overall participation & performance, attendance, participation in sessions, record of completion of pre-determined activities, and acquisition of selected competencies.

- a) Periodic tests: In case of degree courses of three years duration, the concerned departments should conduct three internal assessments, two of them be annual at the end of first and second year. The third internal assessment will be preliminary examination which will be held three months before the final examination conducted by the college similar to final University Examination. The tests may include written papers, practical's /clinicals (Direct Observation of Procedural skills)/ OSCE/Case Based discussion/ Mini Cex and viva voce. Records and marks obtained in such tests will be maintained by the Department and sent to the concerned authority.
- b) Records: Records and marks obtained in tests will be maintained by the head of the



Department and will be made available to the University or NMC.

**9. Dissertation**

- A) Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
- B) The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
- C) Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation

work within six months from the date of commencement of the course on or before the dates notified by the KAHER. The synopsis shall be sent through the proper channel.

- D) Synopsis will be reviewed and the dissertation topic will be registered by the KAHER. No change in the dissertation topic or guide shall be made without prior approval of the KAHER.
- E) The dissertation should be written under the following headings:
  - i. Introduction
  - ii. Aims or Objectives of study
  - iii. Review of Literature
  - iv. Material and Methods
  - v. Results
  - vi. Discussion
  - vii. Conclusion
  - viii. Summary
  - ix. References
  - x. Tables
  - xi. Annexures
- F) The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the Guide, Head of the department and Head of the Institution.
- G) Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the Institute.

- H) The dissertation shall be valued by 2 EXTERNAL examiners appointed by the KAHER and assessed for 20 marks.
- I) Guide: The academic qualification and teaching experience required for recognition by KAHER as a guide for dissertation work is as per Medical Council of India, Minimum Qualifications for Teachers in Medical Institutions Regulations, 2000. -Teachers in a medical college/institution having a total of eight yearsteaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognized as post graduate teachers.
- J) A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching/training by KAHER /National Medical Commission of India. The co- guide shall be a recognized post graduate teacher of KAHER.
- K) Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the KAHER.

## 9) DISTRICT RESIDENCY PROGRAMME (DRP) –

### **Preamble:**

Doctors have to be trained in diverse settings including those which are close to the community. Hence, they should be trained in the District Health System / the District Hospitals. Provided that in respect of M.D./M.S. students admitted with effect from academic session 2021, the training imparted as part of the District Residency Programme, shall be considered as training imparted in a medical institution.

**Objectives:** The main objectives of the District Residency Programme (DRP) would be:

- a. To expose the post-graduate student to the District Health System/ District Hospital and involve them in health care services being provided by District Health System /District Hospital for learning while serving;
- b. To acquaint them with the planning, implementation, monitoring, and assessment of outcomes of the National Health programmes at the district level.

- c. To orient them to promotive, preventive, curative and rehabilitative services being provided by various categories of healthcare professionals under the umbrella of the National Health Mission. In doing so, the post-graduate medical students would also be contributing towards strengthening of services of the District Health System as Speciality resident doctors working as members of the district teams.

**d. District Residency Programme:**

All post-graduate students pursuing M.D./M.S. in broad specialties in all medical colleges/institutions under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the postgraduate programme. This rotation shall be termed as 'District Residency Programme' (DRP) and the post-graduate medical student undergoing training shall be termed as a 'District Resident'.

**e) Training and Responsibilities of District Residents:**

The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC). During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/ sections/services at the District Health System/ District Hospital. The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Speciality and encompass night duties. Post-graduate students of specialties where direct patient care is not involved will be trained by District Health System/ District Hospital teams within the available avenues in coordination with the District Health Officer/Chief Medical Officer. They would be trained in and contribute to the diagnostic/laboratory services, pharmacy services, forensic services, general clinical duties, managerial roles, public health programmes etc., as applicable.

They may also be posted in research units / facilities, laboratories and field sites of the Indian Council of Medical Research and other national research organizations.

**f) Stipend and Leave for District Residents:**

The District Residents shall continue to draw full stipend from their respective medical colleges for the duration of the rotation subject to the attendance record submitted by the appropriate district authorities to the parent medical college/institution, based on methods and system as prescribed. Subject to exigencies of work, the District Resident will be allowed one weekly holiday by rotation. They shall also be entitled to leave benefits as per the rules/ guidelines of the parent college/university.



**g) Training during DRP and Certification thereof:**

- a. Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. Such monitoring systems shall also be accessible to the State/Union Territory Steering Committee and the National Coordination Cell.
- b. The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.
- c. Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective post-graduate course.
- d. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to be decided by the PGMEB to the concerned medical college and the Govt. of the State/UT.

**11) Scheme of Examination-**

M.D./M.S. Degree shall consist of

Both Formative Assessment (examination) and Summative Assessment (examination) consisting of Theory, Clinical/Practical and Viva Voce.

Both Formative Assessment (examination) and Summative Assessment (examination). shall consist of Theory, Clinical/Practical and Viva Voce.

The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 8 months between the two examinations.

#### **Formative Assessment:**

Formative assessment should be continual and should assess medical knowledge, procedural and academic skills, interpersonal skills, professionalism, self- directed and ability to practice in the system.

#### **General Principles-**

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

### **SUMMATIVE ASSESSMENT**

Essential pre-requisites for appearing for examination include:

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS 2023. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

#### **Methodology**

Broad Specialties: Doctor of Medicine (M.D.)/Master of Surgery (M.S.): M.D./M.S. examinations, in any subject shall consist of theory papers, and clinical/practical and viva voce examinations and Dissertation..

##### **a. Theory:**

The theory examination (both formative and summative) may be of descriptive answer of a question type. Theory examination for summative examination shall be of four theory papers. The first and the fourth paper shall be on basic medical science and recent advances, respectively. The theory examination shall be held well in advance before the clinical and practical examination.

##### **b. Practical and viva voce**

i. Clinical examination for the subjects in clinical sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a consultant/specialist/teacher, for which candidates shall be examined for one long case and two short cases.

ii. Practical examination for other subjects shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/ laboratory studies and his ability to perform such studies as are relevant to his subject.

iii. The viva voce examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the Speciality.

iv. Practical examination shall include Objective Structured Practical Examination (OSPE)

- c) **Dissertation :** Every candidate shall carry out work and submit a dissertation Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

#### **Examiners:**

a. The examiner (both internal and external) for the post-graduate examination in Broad and Super Specialties shall have three years' experience as recognised Post-graduate Guide in the concerned subject.

b. The minimum number of examiners for post-graduate examination shall be four. Out of which, at least two shall be external examiners and least one of them shall be from different university outside the state.

c. An examiner shall not be appointed for more than two consecutive regular examinations for the same institution.

#### **Valuation:**

- a. All the teachers of the other colleges of the concerned University or other Universities, who are eligible to be post-graduate examiners, can perform the valuation of the answer scripts.
- b. All the answer scripts shall be subjected for two valuations by the concerned University. The average of the total marks awarded by the two valuers for the paper, which is rounded off to the nearest integer (whole number), shall be considered for computation of the results. All the answer scripts, where the difference between two valuations is 15% and more of the total marks prescribed for the paper, shall be subjected to third valuation. The average of the best two total marks, awarded by the three evaluators for the paper, rounded off to the nearest integer (whole number), shall be considered for final computation of the results.
- c. c. After the computation and declaration of the results, under no circumstances, revaluation is permitted.

- d. d. All the Health Universities/Institutions imparting post-graduate courses shall implement digital valuation.



**L) Revised Eligibility requirements for PG Students in Broad Speciality and Super Speciality for appearing in University examination:**

- Have minimum one Poster presentation or Podium presentation at a National / Zonal / State Conference of his / her specialty.
- Have minimum one Research paper published in journal of his / her specialty as first author.
- Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
- Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
- Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
- Thesis acceptance by all evaluators before the conduct of University Examination.

**Written Examination (Theory):** A written examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances shall be covered in 4th paper. In basic medical subjects and para-clinical subjects, questions on applied clinical aspects should also be asked.

<b>Paper</b>	<b>No. of Questions</b>	<b>Marks for each Question</b>	<b>Total Marks</b>
Paper-I	10	10	100
Paper-II	10	10	100
Paper-III	10	10	100
Paper-IV	10	10	100
		<b>GRAND TOTAL</b>	<b>400</b>

**Practical/Clinical Examination :**

a) In case of practical examination, it should be aimed at assessing competence and skills, Techniques of procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her-subject.

b) In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

c) The total marks for practical/clinical examination shall be **300**.

**Viva Voce:** Viva Voce Examination shall aim at assessing depth of knowledge, logical reasoning and oral communication skills. The total marks shall be 100.

Criteria for declaring as pass in KAHER Examination: A candidate shall secure not less than 50% marks in each head of passing which shall include

- (1) Theory,
- (2) Practical including clinical and viva voce examination separately.

**Pre/Para-Clinical:**

<b>Description</b>	<b>M.D/M.S.</b>
<b>THEORY</b>	
• No. of Theory papers	04
• Marks for each Theory paper	100
<b>Total marks for Theory papers</b>	<b>400</b>
Passing minimum for Theory	200/400 (40% minimum in each paper)
<b>PRACTICALS</b>	300

• Dissertation	20
• OSPE	25 (5 stations x 5 marks)
• Subject specific assessment	255
<b>VIVA</b>	100
• Criteria for passing	A candidate in a subject has to score theory and practical + viva separately with a minimum of 50% marks.
• Criteria for passing	A candidate in a subject has to score theory and practical + viva separately with a minimum of 50% marks.

**Passing criteria :**

“Obtaining a minimum of 50% marks in theory as well as Practical separately shall be mandatory for passing the whole Examination. (Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the 4 papers shall be mandatory. Obtaining a minimum of 50% marks (clinical and Viva-voce together) in Practical is mandatory)”.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Controller of Examinations.



1. Declaration of distinction : A successful candidate passing the KAHER examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.
2. Number of Candidates per day : The maximum number of candidates for practical/clinical and viva-voce examination for degree course shall be up to 8 per day.



## **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN ANATOMY**

### **Preamble:**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

These guidelines would help to achieve a uniform level of training of MD Anatomy to post graduate students throughout the country. The student, after undergoing the training, should be able to deal effectively with the needs of the medical community and should be competent to handle all problems related to the specialty of Anatomy and recent advances in the subject. The post graduate student should also acquire skills in teaching anatomy to medical and para-medical students and be able to integrate teaching of Anatomy with other relevant subjects, while being aware of her/his limitations.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### **Goal :**

The **Goal** of MD Anatomy is to train a doctor to become a competent teacher and researcher in Anatomy who:

1. Is aware of *contemporary advances and developments* in the field of Anatomy.
2. Has *acquired the competencies* pertaining to the subject of Anatomy that are required to be practiced at all levels of health system.
3. Is oriented to the *principles of research methodology*.
4. Has acquired *skills in educating* medical and paramedical professionals.
5. Has acquired *skills in effectively communicating* with the students and colleagues from various medical and paramedical fields.
6. Has acquired skills of integrating anatomy with other disciplines as and when needed.
7. Has acquired qualities of a good teacher capable of innovations in teaching methodology.
8. Has been able to demonstrate adequate management skills to function as an effective leader of the team engaged in teaching and research.

## **Competencies**

After completing the three-year course in MD Anatomy, the student should have achieved Competence in the following:

### **1. Knowledge of Anatomy**

- 1.1. Acquire competencies in gross and surface anatomy, neuroanatomy, embryology, genetics, Histology, radiological anatomy, applied aspects and recent advances of the above mentioned branches of anatomy to clinical practice.

### **2. Practical and Procedural skills**

- 2.1 Acquire mastery in dissection skills, embalming, tissue preparation, staining and museum preparation.

### **3. Training skill in Research Methodology**

- 3.1 Acquire skills in teaching, research methodology, epidemiology & basic information technology.
- 3.2 Acquire knowledge in the basic aspects of Biostatistics and research methodology.
- 3.3 Has knowledge to plan the protocol of a thesis, carry out review of literature, execution of research project and preparation of report.
- 3.4 Has ability to use computer applications Microsoft office (Microsoft word, excel, power point), Internet, Searching scientific databases (e.g. PubMed, Medline, Cochrane reviews).
- 3.5 Acquire skills in paper & poster preparation, writing research papers and Thesis.

### **4. Professionalism, attitude and communication skills:**

- 4.1 Develop honest work ethics and empathetic behavior with students and colleagues.
- 4.2 Acquire capacity of not letting his/her personal beliefs, prejudices, and limitations come in the way of duty.
- 4.3 Acquire attitude and communication skills to interact with colleagues, teachers ,students , body donors and their families.

### **5. Teaching Anatomy**

- 5.1 Practicing different methods of teaching-learning.
- 5.2 Making presentations of the subject topics and research outputs.

### **6. Problem Solving**



- 6.1 Demonstrate the ability to identify applied implications of the knowledge of anatomy and discuss information relevant to the problem, using consultation, texts, archival literature and electronic media.
- 6.2 Demonstrate the ability to correlate the clinical conditions to the anatomical/embryological/hereditary factors.
- 6.3 Demonstrate the ability to evaluate scientific/clinical information and critically analyze conflicting data and hypothesis.

### ***SUBJECT SPECIFIC COMPETENCIES***

**At the end of the course, the student should have acquired following competencies:**

#### **A. Cognitive domain**

1. Describe gross anatomy of entire body including upper limb, lower limb, thorax, abdomen, pelvis, perineum, head and neck, brain and spinal cord.
2. Explain the normal disposition of gross structure, and their interrelationship in the human body. She/He should be able to analyze the integrated functions of organs systems and locate the site of gross lesions according to deficits encountered.
3. Describe the process of gametogenesis, fertilization, implantation and placenta formation in early human embryonic development along with its variation and applied anatomy.
4. Describe the sequential development of organs and systems along with its clinical anatomy, recognize critical stages of development and effects of common teratogens, genetic mutations and environmental hazards. She/He should be able to explain developmental basis of variations and congenital anomalies.
5. Explain the principles of light, transmission and scanning, compound, electron, fluorescent and virtual microscopy.
6. Describe the microscopic structure of various tissues & organs and correlate structure with functions as a prerequisite for understanding the altered state in various disease processes.
7. Describe the structure of cell and its components, cell cycle, cellular differentiation and proliferation.
8. Describe structure, number, classification, abnormalities and syndromes related to human chromosomes.
9. Describe important procedures in cytogenetics and molecular genetics with its application.
10. Describe about single gene pattern inheritance, intermediate pattern and multiple alleles, mutations, non-mendelian inheritance, mitochondrial inheritance, genome imprinting and parental disomy.
11. Describe multifactorial pattern of inheritance, teratology, structure gene, molecular screening, cancer genetics and pharmacogenetics.
12. Describe about reproduction genetics, assisted reproduction, prenatal diagnosis, genetic counseling and ethics in genetics.
13. Explain principles of gene therapy and its applied knowledge.
14. Describe immune system and cell types involved in defense mechanisms of the body. Also explain gross features, cytoarchitecture, functions, development and histogenesis of various

primary and secondary lymphoid organs in the body.

15. Describe about common techniques employed in cellular immunology and histocompatibility testing.
16. Describe structure & development of tissue-organ system to comprehend deviations from normal.
17. Demonstrate knowledge about recent advances in medical sciences which facilitate comprehension of structure function correlations and applications in clinical problem solving.
18. Explain collection, maintenance and application of stem cells, cryo-banking and principles of organ donation from recently dead bodies.
19. Demonstrate knowledge about surface marking of all regions of the body.
20. Able to interpret various radiographs of the body, normal CT-Scan, ultrasound and MRI.
21. Describe the different anthropological traits and use of related instruments.
22. Describe the outline of comparative anatomy of whole body and basic human evolution
23. Demonstrate knowledge about identification of human bones, determination of sex, age, and height for medico legal application of anatomy

#### **B. Affective domain**

1. Demonstrate self-awareness and personal development in routine conduct. (*Self-awareness*)
2. Communicate effectively with peers, students and teachers in various teaching learning activities. (*Communication*)
3. Demonstrate
  - a. Due respect in handling human body parts & cadavers during dissection. (*Ethics & Professionalism*)
  - b. Humane touch while demonstrating living surface marking in subject/patient. (*Ethics & Professionalism*)
4. Acquire capacity of not letting his/her personal beliefs, prejudices and limitations come in the way of duty.
5. Appreciate the issues of equity and social accountability while exposing students to early clinical exposure. (*Equity and social accountability*)
6. Ability to communicate with the registered body donors and family of donors.

#### **C. Psychomotor domain**

At the end of the course the student should be able to:

1. Identify, locate and demonstrate surface marking of clinically important structures in the cadaver and correlate it with living anatomy.
2. Acquire mastery in dissection skills, embalming, tissue preparation, staining and museum preparation.
3. Locate and identify clinically relevant structures in dissected cadavers.
4. Locate and identify cells & tissues under the microscope.
5. Identify important structures visualized by imaging techniques, specifically radiographs,

- computerized tomography (CT) scans, MRI and ultrasonography.
6. Demonstrate various movements at the important joints and actions of various groups of muscles in the human body.
  7. Demonstrate anatomical basis of common clinical procedures expected to be performed by a basic medical doctor.
  8. Demonstrate different methods of teaching-learning and make presentations of the subject topics and research outputs.

### **Specific practice-based competencies:**

#### **Name/Description of practice-based competencies**

##### **1. Gross anatomy:**

- 1.1 Procurement, Embalming and Preservation of human cadavers
- 1.2 Preparation of chemicals for preserving bodies in tanks.
- 1.3 Dissection of cadaver
- 1.4 Window dissection of important regions
- 1.5 Preparation of specimens for museum with display
  - a) soft parts
  - b) models
  - c) charts
- 1.6 Preparation and preservation of human bones / skeleton as assigned by the faculty
- 1.7 Gross anatomy file in which labelled diagrams of important structures of upper limb, lower limb, thorax, abdomen, head & neck and brain should be drawn.

##### **2. Histology**

- 2.1 Preparation of common fixatives like 10% formalin, Bouin's fluid etc
- 2.2 Making paraffin blocks and section cutting and mounting
- 2.3 Preparation of staining set for H and E staining and staining paraffin sections with the stain.
- 2.4 Making celloidin, araldite, gelatin blocks and their section cutting
- 2.5 Processing hard tissues, decalcification of bones, block making and sectioning, preparation of ground sections of calcified bones.
- 2.6 Frozen section cutting on freezing microtome and cryostat
- 2.7 Honing and Stropping of microtome knives, including sharpening by automatic knife

sharpeners

2.8 Histology record book in which Light Microscopic pictures of all the organs and tissues of the body should be drawn and a small description of salient features written

### **3. Histochemical Methods**

3.1 Practical classes for staining of glycogen, mucopolysaccharides, alkaline phosphatase, acid phosphatase, and calcium

### **4. Cytogenetics**

4.1 Preparation of media, different solutions, stains etc.

4.2 Preparation of buccal smear for sex chromatin

Human chromosome preparation from peripheral blood and karyotyping.

4.3 Banding techniques ( G and C)

4.4 Making of Pedigree charts for study of patterns of inheritance.

4.5 Chromosomal Analysis.

### **5. Neuroanatomy:**

5.1 Dissection of brain and spinal cord for teaching and learning purpose

5.2 Preparation of brain and spinal cord macroscopic and microscopic sections and identification of different parts in them.

5.3 Discussions on clinical problems related to neurological disorders and anatomical explanation for the same.

### **Syllabus:**

A post graduate student, after three years of training in M.D. (Anatomy) should have acquired knowledge in the following aspects of anatomy:

#### **A: Cognitive domain:**

##### **Section – I**

##### **Gross anatomy**

Gross Anatomy of entire body including upper limb, lower limb, thorax, abdomen, pelvis, perineum, head and neck, brain and spinal cord

##### **Section – 2**

##### **Developmental anatomy/embryology**



- General embryology: gametogenesis, fertilization, implantation and placenta, early human embryonic development.
- Systemic embryology: development of organ systems and associated common congenital abnormalities with teratogenesis.
- Anatomical basis of congenital anomalies.

### **Section – 3**

#### **Histology and histochemistry**

##### **Cell Biology:**

- Cytoplasm - cytoplasmic matrix, cell membrane, cell organelles, cytoskeleton, cell inclusions, cilia and flagella.
- Nucleus - nuclear envelope, nuclear matrix, DNA and other components of chromatin, protein synthesis, nucleolus, nuclear changes indicating cell death.
- Cell cycle - mitosis, meiosis, cell renewal.
- Cellular differentiation and proliferation.
- **Microscopic structure of the body:**
- Principles of light, transmission and scanning, electron, fluorescent, confocal and virtual microscopy.
- The systems/organs of body - Cellular organization, light and electron microscopic features, structure - function correlations, and cellular organization.
- Various histo-techniques and museum preparation techniques.

### **Section – 4**

##### **Neuroanatomy:**

- Brain and its environment, Development of the nervous system, Neuron and Neuroglia, Somatic sensory system, Olfactory and optic pathways, Cochleovestibular and gustatory pathways, Motor pathways, Central autonomic pathways, Hypothalamo-hypophyseal system, Limbic system, Basal ganglia, Reticular system, Ventricular system of Brain, Cross Sectional anatomy of brain and spinal cord & its applied anatomy.
- Detailed structure of the central nervous system and its applied aspect.

### **Section – 5**

##### **Genetics**

- Human Chromosomes - Structure, number and classification, methods of chromosome preparation banding patterns. Chromosome abnormalities, Autosomal and Sex chromosomal abnormalities syndromes, Molecular and Cytogenetics.
- Single gene pattern inheritance: Autosomal and Sex chromosomal pattern of

inheritance, Intermediate pattern and multiple alleles, Mutations, Non-Mendelian inheritance, Mitochondrial inheritance, Genome imprinting, parental disomy.

- Multifactorial pattern of inheritance: Criteria for multifactorial inheritance, Teratology, Structure gene, Molecular Screening, Cancer Genetics - Haematological malignancies, Pharmacogenetics.
- Reproduction Genetics - Male and Female Infertility, Abortuses, Assisted reproduction, Preimplantation genetics, Prenatal diagnosis, Genetic Counseling and Ethics of Genetics.
- Principles of Gene therapy and its applied knowledge.

## **Section – 6**

### **Immunology**

- Immune system and the cell types involved in defense mechanisms of the body. Gross features, cytoarchitecture, functions, development and histogenesis of various primary and secondary lymphoid organs in the body.
- Biological and clinical significance of the major histocompatibility complex of man including its role in transplantation, disease susceptibility/resistance and genetic control of the immune response.
- Common techniques employed in cellular immunology and histocompatibility testing.
- Molecular hybridization and PCR technology in immunology research particularly mechanism of antigen presentation, structural and functional relevance of the T cell receptor, genetic control of the immune response, Molecular basis of susceptibility to disease.

## **Section – 7**

### **Applied anatomy and recent advances**

- Clinical correlations of structure and functions of human body. Anatomical basis and explanations for clinical problems.
- Applications of knowledge of development, structural (microscopy), neuro anatomy to comprehend deviations from normal.
- Recent advances in medical sciences which facilitate comprehension of structure function correlations and applications in clinical problem solving.
- Collection, maintenance and application of stem cells, cryobanking and principles of organ donation from recently dead bodies.

## **Section – 8**

- **Surface Marking and Radiology**

Surface marking of all regions of the body. Interpretation of normal radiographs of the body including special contrast procedures like barium studies, cholecystography, pyelography, salphingography. Normal CT Scan, MRI and Ultrasound.

## Section – 9

### Anthropology and Comparative Anatomy

- ☐ Different anthropological traits, Identification and use of Anthropological instruments.
- ☐ Outline of comparative anatomy of the whole body and basic human evolution.

## Section – 10

- **Forensic Medicine:**

Identification of human bones from their remains and determination of sex, age, and height. for medico legal application of Anatomy.

### B - PSYCHOMOTOR DOMAIN:

Demonstrate following predominant Psychomotor domain competencies		
Sr. No	Competency	Perform under supervision / perform Independently/ Observation only
1.	Identify, locate and demonstrate surface marking of clinically important structures in the cadaver and correlate it with living anatomy	Independently
2.	Acquire mastery in dissection skills including window dissection of important regions	Independently
3.	Acquire mastery in embalming the human body	Independently
4.	Prepare tanks for preserving bodies	Observation
5.	Tissue preparation for histology and staining techniques	Independently
6.	Honing and Stropping of microtome knives, including sharpening by automatic knife sharpener	Independently
7.	Preparation of common fixatives embalming fluid 10% formalin, Bouin's fluid etc.	Independently
8.	Demonstrate the mounting of specimen in the museum	Independently
9.	Locate and identify clinically relevant structures in dissected cadavers.	Independently
10.	Locate, identify and demonstrate cells & tissues under the microscope.	Independently

11.	Identify the anatomical structures visualized by imaging techniques, specifically radiographs, computerized tomography (CT) scans, MRI and ultrasonography in normal individuals	Independently
12.	Demonstrate various movements at the important joints and actions of various groups of muscles in the human body.	Independently
13.	Demonstrate anatomical basis of common clinical procedures expected to be performed by a basic medical doctor.	Under supervision
14.	Demonstrate different methods of teaching-learning and assessments. Independently	Independently
15.	Make presentations of the subject topics for teaching and research outputs. independently	Independently
16.	Prepare buccal smear for sex chromatin. independently	Independently
17.	Prepare Human chromosome from peripheral blood and karyotyping. Under supervision	Under supervision
18.	Demonstrate Banding techniques (G and C) and Chromosomal Analysis Under supervision	Under supervision
19.	Demonstrate use of different anthropological instruments	Under supervision

### **Departmental Resources:**

It is mandatory for the Department of Anatomy to develop at least three of the following laboratories, in addition to the other facilities. The laboratory should be involved in active research in at least one well defined field.

1. Histology
2. Immunology
3. Electron microscopy / Fluorescence microscopy / confocal and other forms of microscopy laboratories
4. Developmental anatomy
5. Anthropometry
6. Neuroanatomy
7. Cytogenetics
8. Imaging technique for Radiological Anatomy

### **TEACHING AND LEARNING METHODS:**

#### **General principles**

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and



emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

### **Teaching-Learning methods**

This should include a judicious mix of demonstrations of dissections, symposia, journal clubs, seminars, small group discussion, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject should also be used. The suggested examples of teaching-learning methods are given below but are not limited to these.

**A. Lectures:** Didactic lectures should be used sparingly. A minimum of 10 lectures per year is suggested. All postgraduate trainees will be required to attend these lectures. Some examples of topics which can be covered in lecture are:

1. Topics in gross, surface and cross sectional anatomy, microanatomy, embryology, neuroanatomy, histochemistry, and genetics.
2. Recent advances in microanatomy, embryology, neuroanatomy, histochemistry, and genetics.
3. Research methodology and biostatistics.
4. Salient features of Undergraduate/Postgraduate medical curriculum.
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.

**B. Journal club:** Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

**C. Student Seminar:** Minimum of once every 1-2 weeks is suggested.

Important topics should be selected and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

**D. Student Symposium: Minimum of once every 3 months.**

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

**E. Laboratory work:** Minimum - once every 1-2 weeks.

Laboratory work/ Skills lab teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions. Hands-on experience on various techniques and procedures in microanatomy, histochemistry, genetics, embalming & preparation of museum specimens should be acquired.

#### **F. Interdepartmental colloquium**

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest.

#### **G. a) Rotational clinical / community / institutional postings**

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines. **The postings schedule with duration is given below:**

- |                           |                                                                      |
|---------------------------|----------------------------------------------------------------------|
| ● Surgery                 | -1 weeks                                                             |
| ● Radiology               | -1 weeks                                                             |
| ● Pathology               | -2 weeks                                                             |
| ● ENT                     | -1 week                                                              |
| ● Ophthalmology           | -1 week                                                              |
| ● Obstetrics & Gynecology | -1 week                                                              |
| ● Pediatrics              |                                                                      |
| ● Medical Education Unit  | -1 week (Optional & can be done in common with other department PGs) |

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction

with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

**G. b) Posting under “District Residency Programme” (DRP):**

- **Preamble:** Doctors have to be trained in diverse settings including those which are close to the community. Hence, they should be trained in the District Health System / the District Hospitals.

Provided that in respect of M.D./M.S. students admitted with effect from academic session 2021, the training imparted as part of the District Residency Programme, shall be considered as training imparted in a medical institution.

- **Objectives:** The main objectives of the District Residency Programme (DRP) would be:

To expose the post-graduate student to the District Health System/ District Hospital and involve them in health care services being provided by District Health System /District Hospital for learning while serving;

To acquaint them with the planning, implementation, monitoring, and assessment of outcomes of the National Health programmes at the district level.

To orient them to promotive, preventive, curative and rehabilitative services being provided by various categories of healthcare professionals under the umbrella of the National Health Mission.

In doing so, the post-graduate medical students would also be contributing towards strengthening of services of the District Health System as Speciality resident doctors working as members of the district teams.

- **Definition of District Hospital:** For the purpose of this programme, a District Hospital shall be a functional public sector/government-funded hospital of not less than 50 beds with facilities/staff for the designated specialties at that level/facility. Any post-graduate medical institution or a super-speciality hospital will not be considered as district hospital.
- **Definition of District Health System:** For the purpose of this programme, the District Health System shall include all public sector/government-funded hospitals and facilities (including community health centres, primary health centres, sub-health centres, urban health centres, etc.), as well as community outreach system in a district. This would also include district system engaged in running respective public health services including the implementation of national and state public health programmes.
- **District Residency Programme:** All post-graduate students pursuing M.D./M.S. in broad specialties in all medical colleges/institutions under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course

curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduate programme. In the case of those students who have taken admission after completion of the Diploma in the relevant Speciality, the District Residency Programme shall take place in the third semester only. Similarly, the post-graduate diploma students shall undergo the District Residency Programme in the third semester. This rotation shall be termed as 'District Residency Programme' (DRP) and the post-graduate medical student undergoing training shall be termed as a 'District Resident'.

- **Training and Responsibilities of District Residents:** The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC). During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/sections/services at the District Health System/ District Hospital. The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Speciality and encompass night duties. Post-graduate students of specialities where direct patient care is not involved will be trained by District Health System/ District Hospital teams within the available avenues in coordination with the District Health Officer/Chief Medical Officer. They would be trained in and contribute to the diagnostic/laboratory services, pharmacy services, forensic services, general clinical duties, managerial roles, public health programmes etc., as applicable. They may also be posted in research units / facilities, laboratories and field sites of the Indian Council of Medical Research and other national research organizations.
- **Stipend and Leave for District Residents:** The District Residents shall continue to draw full stipend from their respective medical colleges for the duration of the rotation subject to the attendance record submitted by the appropriate district authorities to the parent medical college/institution, based on methods and system as prescribed. Subject to exigencies of work, the District Resident will be allowed one weekly holiday by rotation. They shall also be entitled to leave benefits as per the rules/guidelines of the parent college/university.
- **Training during DRP and Certification thereof:**

Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. Such monitoring systems shall also be accessible to the State/Union Territory Steering Committee and the National Coordination Cell.

The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.



Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective post-graduate course.

The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to be decided by the PGMEB to the concerned medical college and the Govt. of the State/UT.

#### **H. Teaching research skills**

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis (if so mandated) under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

#### **I. Training in teaching skills**

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

#### **Others**

The students shall undergo training in other courses such as on Telemedicine, how to write a manuscript and make effective presentations, use of Pubmed and other resources etc. as required – The student shall attend a one-day Medical Education Technology (MET) training workshop conducted by the Institution.

#### **J. E-Log book**

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in labs, dissection hall, skill labs and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a

record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the Log Book is to:

- a) help maintain a record of the work done during training,
- b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
- c) provide feedback and assess the progress of learning with experience gained periodically.

The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination.

It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the NMC Logbook Guidelines uploaded on the Website.

#### **K. Course in Research Methodology:**

- All postgraduate students shall complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated in successful completion of the course and examination.
- Complete a certificate course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.

**Other aspects:**

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students attending in the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) atleast once a year.
- Have minimum one Poster presentation or Podium presentation at National / Zonal / State conference of his / her specialty.
- Have minimum one Research paper published in journal of his / her specialty as first author.
- Department shall encourage e-learning activities.
- Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institutions.
- The Postgraduate trainees must undergo training in information technology and use of computers.

**ASSESSMENT****Examination**

Examination shall consist of dissertation, written paper (theory), practical and viva voce. The Examination shall be organized based on marking system to evaluate and to certify post graduate's students level knowledge, skill and competence at the end of the training.

**Criteria for Passing**

Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degrees' examination shall be mandatory. Obtaining if 50% marks in Practical Examination shall be mandatory of passing the practical examination. Hence a candidate shall secure not less than 50% marks in each head of examination which shall include Theory, Practical and Viva voce examination. No grace mark is permitted in Postgraduate Examination either for Theory or for Practical.

**FORMATIVE ASSESSMENT**

**Formative assessment should be continual and should assess medical knowledge, patientcare, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.**

During the three-year training period,

- A record of all theoretical, practical and experimental work done by the post graduate student and its assessment will be kept and shall be available for examiners at the time of the final practical and viva voce examination.
- There will be periodical examinations during the course of training. The pre-final theory and practical examination will be conducted by the faculty of the concerned college.

### **General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

- ❖ Quarterly assessment during the MD training should be based on:
  - Dissection presentation : once a week
  - Laboratory performance : twice a week
  - Journal club : once a week
  - Seminar : once a fortnight
  - Case discussions : once a fortnight/month
  - Interdepartmental case or seminar : once a month
- **Note:** These sessions may be organized and recorded as an institutional activity for all postgraduates
- ❖ The PG student will have to take formative assessment exam both theory & practical at the end of every Academic year

**The student to be assessed periodically as per categories listed in the preclinical postgraduate student appraisal form (Annexure I).**



## SUMMATIVE ASSESSMENT

**Essential pre-requisites for appearing for examination include:**

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted
2. Have minimum one Poster presentation or Podium presentation at National / Zonal / State conference of his / her specialty. One research paper should be published / accepted in an indexed journal. **(It is suggested that the local or University Review committee assess the work sent for publication).**
3. Have minimum one Research paper published in journal of his/ her specialty as first author.
4. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
5. Complete a certification course in ethics including Good Clinical Practices and Good Laboratory practices (whichever is relevant to them) in the first year of the course conducted by institutions.
6. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institutions.

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS 2023. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

The postgraduate examination shall be in three parts:

### **1. Thesis**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical

examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the Thesis acceptance by all evaluators before the conduct of University Examination.

## **2. Theory examination**

The examinations shall be organized on the basis of 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS 2023. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ M.S shall be held at the end of 3<sup>rd</sup> academic year.

There shall be four theory papers (as per PG Regulations 2023).

### **Paper I: 100 Marks**

**Gross Anatomy, Embryology, Microscopic Anatomy, Radiological  
Anatomy of human body Above the diaphragm & Body Preservation**

- a) Gross Anatomy of human body above the diaphragm i.e. upper limb, thorax, head and neck.
- b) Embryology & Microscopic anatomy of tissues and organs above the diaphragm.
- c) Methods of preservation of human body and its parts, radiological anatomy, sectional anatomy

### **Paper II: 100 Marks**

**Gross Anatomy, Embryology, Microscopic Anatomy, Radiological  
Anatomy of human body Below the diaphragm , General Anatomy,  
General Embryology and General Histology**

- a) Gross Anatomy of human body below the diaphragm i.e. lower limb, abdomen, pelvis.
- b) Embryology & Microscopic anatomy of tissues and organs below the diaphragm.
- c) General Histology, General Embryology
- d) Principles of light, transmission and scanning electron microscopy,

confocal, virtual microscopy.

**Paper III: 100 Marks**

**Neuroanatomy & Genetics**

- a) Neuroanatomy - gross and applied aspects.
- b) General principles of genetics, cytogenetics as applicable to medicine and different genetic disorders, gene therapy.

**Paper IV: 100 Marks**

**Recent advances and applied Anatomy in medical sciences**

- a) Comparative and evolutionary anatomy
- b) Clinical and applied aspect of Anatomy
- c) Recent advances in the application of knowledge of anatomy on human body
- d) Basics of principles of Body donation and Organ donation from recently dead bodies / brain dead patients and ethics involved in them.

**3. Practical/clinical and Oral / viva voce**

**examination Practical examination**

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

- **First Day Practical:** To submit the duly signed gross anatomy file, histology file & the log book and thesis

- a) **Gross Anatomy**

- Dissection and related viva voce, Major and minor dissections to be included.

- b) **Histology**

- Spotting (10 spots) and viva voce

- Techniques of tissue processing, paraffin block making,

- section cutting and staining (H and E stain) with related viva

- **Second Day Practical:**

- a) Microteaching of a short topic to assess teaching skills
  - b) A short synopsis of the thesis work should be presented by the postgraduate student
  - c) Grand viva including Gross anatomy, cross sectional anatomy, radiological Anatomy, Surface Anatomy, Embryology.

**Oral/Viva voce examination** on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

**Practical Examination to be organized as per details given below:**

- Dissection on cadaver
- Histology spotting
- Histological techniques
- Surface Marking
- Radiology
- Teaching ability
- Thesis presentation

**Oral / Viva-voce Examination**

**Grand viva**

On dissected parts of the whole human body including nervous system, and Embryology models, teratology, skeletal system including short bones, embalming techniques and genetics, radiographs, MRI, CT & ultrasonography.

Day 1	<b>GROSS ANATOMY</b>	
	1. 3 hours Window <b>dissection</b> of the allotted gross anatomy topic on human cadaver	60 Marks
	2. Display and discussion of the allotted dissection exercise on a human cadaver	50 Marks
	3. Surface anatomy ( <b>Objective Structured Practical Examination- OSPE</b> )	10 marks ( 2 x 5= 10)
	4 <b>DISCUSSION ON DISSERTATION TOPIC</b> submitted for the examination	20 Marks
	<b>TOTAL</b>	<b>140Marks</b>
	<b>HISTOLOGY</b>	
	1. Identification and discussion of 10 stained slides (general histology, systemic histology, neuroanatomy) including Human Genetics charts	100 Marks 10 marks per slide X 10 number]
	2. <b>Tissue preparation and staining</b>	
	I Preparation of a paraffin block	10 Marks
	ii. Taking serial sections from blocks provided	10 Marks



	iii. Staining of given section with H & E and discussion (OSPE)	15 Marks
	iv. Discussion on histological techniques	05 Marks
	<b>TOTAL</b>	<b>140 marks</b>

	<b>PEDAGOGY:</b> Demonstration of teaching skill / techniques	<b>20 Marks</b>
Day 2	<b>VIVA VOCE</b> <ul style="list-style-type: none"> <li>All the components of the syllabus along with specimens,</li> <li>Embryology models</li> <li>Osteology</li> <li>Radiographs, MRI, CT &amp; ultrasonography</li> </ul>	100 Marks
	<b>TOTAL</b>	<b>100 Marks</b>

#### Commended reading:

Max marks for M.D Anatomy	Theory	Practical's	Viva-voce	Marks
	<b>400</b>	<b>300</b>	<b>100</b>	<b>800</b>

#### Scheme of Examination

SL No	Description	MD Anatomy
1	<b>THEORY</b>	
	No of Theory Paper	4
	Marks for each Theory Paper	100
	Total marks for Theory Paper	400
	Passing Minimum for Theory	200/400 (40% minimum in each paper)
2	<b>PRACTICAL</b>	300
	• Dissertation	20 marks
	• OSPE	25
	• Subject specific assessment	255
3	<b>VIVA VOCE</b>	100
	Passing minimum for Practical including Viva voce	200/400
	<p>The candidate shall secure not less than 50% marks in each head of passing which shall include</p> <p>(1) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)</p> <p>(2) Practical/Clinical and Viva voce - aggregate 50%</p> <p>(3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.</p> <p>(4) 5 per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination</p>	

	marks. External examiner outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce. (5) No grace mark is permitted in post-graduate examination either for theory or for practical
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- The University shall conduct not more than two examinations in a year for a subject, with an interval of not less than four and not more than eight months (8) between the examinations.

Books (latest Edition)

### **Gross Anatomy:**

- Susan Strandring: Gray's Anatomy: The anatomical basis of clinical practice, Churchill Livingstone Elsevier.
- Keith and Moore Clinically Oriented Anatomy. Lippincott Williams and Wilkins.
- R.J. Last. Anatomy Regional and Applied. Churchill Livingstone.
- Frank H. Netter. Atlas of Human Anatomy. Saunders Elsevier.
- ML Ajmani. Embalming: Principles and Legal Aspects. Jaypee Brothers.

### **Histology**

- Young B. and Heath J. Wheater's Functional Histology. Churchill Livingstone.
- M.H. E Ross. Histology: A textbook and atlas. Williams and Wilkins.
- Harold A Davenport. Histological and Histochemical Techniques. W.B Saunders Company.

### **Genetics**

- J.S Thompson and Thompson. Genetics in medicine. W.B. Saunders and Co. Philadelphia, London.

### **Embryology**

- TW Sadler. Langman's Medical Embryology. Lippincotts, Williams and Wilkins
- Keith L Moore and T.V.N. Persaud. The Developing Human. Saunders.

### **Neuroanatomy**

- Richard S. Snell. Clinical Neuroanatomy for Medical Students. Williams and Wilkins.

### **Statistics**

- David E. Matthews and Vernon T. Farewell. Using and Understanding Medical Statistics. Karger.

## Radiology

- J.B. Walter et.al. Basic Atlas of Sectional Anatomy with correlated imaging. SaundersElsevier.

## Surface anatomy

- SP John, Lumley editors. Surface Anatomy, The Anatomical basis of clinical examination. London: Churchill Livingstone.

## Journals

03-05 international Journals and 02 national (all indexed) journals  
Annexure 1

Student appraisal form for MD in Anatomy											
	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic aptitude and learning</b>										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work-based assessments										
1.6	Self-directed Learning										
<b>2</b>	<b>Work related to training</b>										

2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of training										

<b>3</b>	<b>Professional attributes</b>										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
<b>4</b>	<b>Space for additional comments</b>										
<b>5</b>	<b>Disposition</b>										
	Has this assessment pattern been	Y es	N o								

	discussed with the trainee?										
	If not explain.										
	Name and Signature of the assessee										
	Name and Signature of the assessor										
	Date										



**COMPETENCY BASED  
POSTGRADUATE TRAINING PROGRAMME FOR  
MD IN PHYSIOLOGY**

## Preamble

The purpose of postgraduate medical education in Physiology is to produce experts with necessary knowledge, skills and attitude to function as competent physiologists who actively contribute towards growth of the subject through research and intellectual contribution, participate in the training of budding health professionals, participate meaningfully in-patient care and lifestyle disorders, stay abreast with the advancements in the field and serve the community at large. Physiology being the basis of entire practice of Medicine, a postgraduate in Physiology needs to acquire all necessary competencies that would enable him or her to function efficiently in domains of preclinical, para- clinical and clinical sciences.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes. The Expert group of the National Medical Commission has endeavored to render uniformity without compromise to purpose and content of this document. The revision within the document are mainly aimed to introduce competencies that ensure application of Physiology beyond preclinical boundaries and thereby improve health outcomes, embrace research and pedagogy as a vital part of training and reduce redundancy of contents. This document envisions a competent Physiologist who performs the roles of a Medical Teacher, Researcher, Member of Health Care Team (Clinical Physiologist), Administrator and Life Long learner with equal zeal and efficiency.

## SUBJECT SPECIFIC LEARNING OBJECTIVE

### Focus and Goal

The goal is to have uniform standards in the teaching of Physiology at the postgraduate level throughout the country. The guidelines will help in achieving such standards which will ensure availability of competent physiologists equipped with required skills for teaching, patient care (diagnostic, therapeutic and rehabilitative) and applied research.

The focus and goal of post-graduate medical education shall be to produce competent specialist and medical teachers recognized by the fraternity as the graduating scholars, building upon their undergraduate education and skills who shall –

- i. Recognize the health needs of the community and carry out professional obligations ethically keeping in view the objectives of the national health policy;
- ii. Have mastered most of the competencies, pertaining to the respective specialty, that is required to be practiced at the secondary and the tertiary levels of the health care delivery system;
- iii. Be aware of the contemporary advancements and developments in the respective discipline concerned and shall progress accordingly;
- iv. Have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology;
- v. Have acquired the basic skills in the teaching of medical and paramedical professionals;
- vi. Acquire basic management skills in human resources, materials and resource management related to health care delivery, general hospital management, principal inventory skills and counselling;
- vii. Develop personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals;
- viii. Become an exemplary citizen by observing the highest standards of professional ethics and working towards fulfilling social and professional obligations to respond to national aspirations.

The institutions imparting post-graduate medical education shall continually work to synchronize the institutional goals with the national goals to produce the kind of trained manpower with high knowledge, appropriate skills and impeccable ethical standards required.

### **Learning Objectives**

A postgraduate student having qualified for the MD (Physiology) examination should be able to:

1. Achieve comprehensive knowledge of general, systemic and applied Physiology.
2. Teach effectively the basic physiological mechanisms of human body in the context of pathophysiological basis of evolution, clinical presentation and management of disease states to undergraduate and postgraduate medical, dental and paramedical courses.
3. Acquire in-depth knowledge of physiology while catering to the learning needs of specific courses such as sports physiology, speech pathology etc.

4. Understand general principles of medical education (use of appropriate teaching techniques and resources) and apply theoretical frameworks in pedagogy.
5. Interpret and evaluate research publications critically.
6. Conduct research in core physiology, applied physiology and Education which may have significant application towards improving health, patient care and student learning.
7. Generate credible evidence towards advancement of Physiology and its application in basic and applied significance.
8. Acquire skills in conducting collaborative research in the field of physiology with allied sciences, clinical sciences and biomedical engineering.
9. Explain how the knowledge of physiology can be effectively applied in diagnostic and therapeutic clinical settings.
10. Integrate physiology with Diagnostic, Therapeutic, Preventive and Rehabilitative Medicine.
11. Interact with the allied departments and render services in advanced laboratory investigations.
12. Interact effectively with other paraclinical, clinical and allied health sciences departments to develop integrated modules in basic sciences and teach competencies related to the same.
13. Acquire administrative skills to set up concerned department / laboratories and initiate purchase procedures and procure necessary items for running such laboratories.
14. Be an efficient Leader and member of academic, research and health care team.
15. Participate actively in various workshops/seminars/journal clubs of allied subjects to acquire various skills for collaborative research.

### **SUBJECT SPECIFIC COMPETENCIES**

**At the end of the course, the postgraduate student should be able to learn:**

#### A. Predominant in Cognitive Domain

1. Demonstrate in-depth understanding of basic physiological concepts, their clinical applications and physiological demands in special circumstances such as sports, environmental changes, yoga, meditation etc.
2. Demonstrate comprehensive knowledge of physiology of specific organ systems to cater to the learning needs of specialized courses such as speech pathology, kinesiology, aerospace physiology etc.
3. Impart knowledge about the basic physiological mechanisms of human body with reference to their implications in the pathophysiology of disease and the physiologic basis of their management to undergraduate medical and paramedical students.
4. Demonstrate knowledge of integrated study of basic sciences as per the needs of current CBME.
5. Demonstrate higher order thinking and problem-solving skills to exhibit interactive teaching techniques and facilitate contextual study of physiology in various teaching learning sessions.
6. Demonstrate knowledge and ability to participate in the present student centric TL strategies of CBME such as ECE, SDL, AETCOM and AITo (Aligned and Integrated Topic).
7. Demonstrate knowledge of the current assessment practices in undergraduate CBME such as DOAP.
8. Demonstrate knowledge of research methodologies and statistics.
9. Conduct such clinical and experimental research, as would have a significant bearing on human health and patient care.
10. Incubate ideas and contribute towards generation of patents and copyrights related to the subject.
11. Interact with other departments by rendering services in advanced laboratory investigations and relevant expert opinion.
12. Participate actively in various workshops/seminars/journal clubs/demonstration



in the allied departments, to acquire various skills for collaborative research.

13. Contribute to society by imparting physiological understanding of health problems. Disseminate knowledge of human physiology, the clinical applications and research as per the needs or specific demands of the society at large.
14. Outline the components of a basic physiology curriculum, demonstrate ability to develop or implement the same in future academic career.
15. Serve as interface with society at large.

### **B Predominant in Affective Domain**

**At the end of the course, the postgraduate student should be able to:**

1. Demonstrate responsibility, professionalism and ethical conduct in all professional undertakings.
2. Demonstrate ethical conduct in biomedical or animal research.
3. Follow ethical guidelines with regards to research and publications.
4. Demonstrate appropriate behavior of not letting his/her personal beliefs, prejudices and limitations come in the way of duty.
5. Display principles of integrity and social accountability as a teacher.
6. Appreciate the issues of equity and social accountability while exposing students to early clinical exposure (Equity and social accountability).
7. Mentor/ counsel students to facilitate their holistic development.
8. Communicate effectively with peers, students and teachers in various curricular [teaching-learning, research] activities.
9. Function effectively as a member of the department, professional bodies and maintain professional conduct in interactions with students, peers, patient and staff.
10. Demonstrate the ability to give effective student feedback to undergraduate students.
11. Demonstrate the ability to receive feedback from teachers and peers.
12. Develop the capacity to reflect on own academic progress, develop self- directed learning skills and assess own learning needs.

### **C. Predominant in Psychomotor Domain**

**The postgraduate student should acquire practical competencies in the following tasks:**

At the end of the course the postgraduate student should be able to

1. Demonstrate physiological concepts of various organ systems by performing amphibian experiments using simulated models
2. Demonstrate physiological concepts of specific organ systems by performing mammalian experiments using simulated models.
3. Perform and interpret a complete hematological profile
4. Perform clinical examination of various organ systems
5. Perform human experiments pertaining to specific organ systems and interpret results of the same
6. Perform human experiments related to physiological challenges such as exercise, yoga and meditation
7. Perform studies in stimulated environment - microgravity; high altitude; hot and cold environment.

### **Syllabus**

#### **Course contents:**

#### **A: Cognitive domain**

*Paper-I: General and Cellular Physiology including Genetic Basis and Historical perspectives:*

1. Physiology of cell, various cellular mechanisms and genetic control mechanisms.
2. Various principles of Physics and Physical Chemistry involved in physiological phenomenon e.g. hemodynamics, bio-electrical potentials, body fluids, methods of measurements.
3. History of Physiology, Nobel laureates and discoveries.
4. Biostatistics, Biophysics, Biochemistry, Micro-anatomy.
5. Growth and Development including aging.

6. Excretion, pH, water and electrolyte balance.
7. Comparative Animal Physiology

*Paper-II: Systemic Physiology (system providing transport, nutrition and energy) including comparative Physiology.*

1. Blood and Immunity.
2. Cardiovascular System.
3. Respiratory System.
4. Gastro- Intestinal Tract (GIT) and dietary requirements.

*Paper-III: Systemic Physiology (system concerned with procreation, regulation and neural control)*

1. Nerve-Muscle Physiology including muscle mechanics
2. Endocrine Physiology
3. Nervous System (Central, peripheral and autonomic)
4. Special Senses
5. Reproduction & family planning/fetal & neonatal Physiology

*Paper-IV: Applied Physiology including recent advances*

1. Recent advances relevant to Physiology
2. Patho-physiology pertaining to systemic Physiology
3. Physiological basis of various clinical investigation tests
4. Interaction of human body in ambient environment- high altitude, space and deep sea
5. Exercise & Sports physiology
6. Transgender Physiology
7. Integrated Physiology
8. Yoga and Meditation

9. Social responsibilities of physiologists
10. Application of Artificial Intelligence in Physiology

**B: Psychomotor domain:**

**A. The postgraduate student during the training period must PERFORM independently the following procedures:**

**i. Hematological profile**

1. Estimation of hemoglobin
2. Determination of Total Erythrocyte (RBC) Count and RBC Indices (Blood Standards)
3. Determination of Total Leucocytes (WBC) Count: TLC
4. Preparation of a peripheral Blood Smear and Determination of Differential Leucocyte Count: DLC
5. Determination of Arneth Count
6. Determination of Bleeding Time (BT) and Clotting Time (CT)
7. Determination of Blood groups (A, B, O and Rh system)
8. Determination of Erythrocyte Sedimentation Rate (ESR) and Packed cell volume (PCV)
9. Determination of Osmotic Fragility of Red Blood Cells
10. Determination of Platelet Count
11. Determination of Reticulocyte Count

**ii. Human Physiology**

**a. Clinical Physiology**

1. Detailed clinical examination of various systems.

**b. Nerve muscle physiology**

1. Ergography and hand-grip spring dynamography and study of human fatigue.
2. Recording of electromyography (EMG) and its application.

3. Recording of nerve conduction.

**c. Cardiovascular system (CVS)**

1. Clinical examination of CVS
2. Examination of arterial & venous pulses
3. Measurements of arterial blood pressure and effect of head-up/head-down tilt
4. Recording of 12 lead Electrocardiography (ECG) and its interpretation
5. Measurement of blood flow
6. Heart rate variability
7. Ambulatory Blood pressure monitoring

**d. Respiratory system**

1. Clinical examination of respiratory system.
2. Stethography – study of respiratory movements and effect of various factors.
3. Assessment of respiratory functions (spirometry, vitalography, and gas analysis).
4. Measurement of BMR.
5. Cardio pulmonary resuscitation (CPR) and Artificial respiration.

**e. Gastrointestinal system:**

1. Clinical examination of abdomen.

**f. Integrative Physiology / Excretory system**

1. Recording of body temperature/effect of exposure to cold and hot environment

**g. Reproductive system**

1. Determination of ovulation time by basal body temperature chart and pregnancy diagnostic test - Immunological Tests.
2. Semen analysis: sperm count, motility and sperm morphology.

**h. Nervous System including Special senses**

1. Clinical examination of the nervous system and its physiological basis.
2. Examination of higher mental functions.
3. Examination of cranial nerves.
4. Examination of sensory system.



5. Examination of motor system including reflexes.
6. Clinical examination of special senses:
  - (i) Smell and Taste
  - (ii) Test for hearing to differentiate deafness
  - (iii) Physiology of eye:
    - (a) Clinical examination of the eye and pupillary reflex
    - (b) Visual acuity
    - (c) Perimetry – mapping out of visual field and blind spot
    - (d) Accommodation
    - (e) Fundoscopy
    - (f) Colour vision and colour blindness
7. Reaction (visual and auditory) and reflex time.
8. Electroencephalography (EEG) and Polysomnography
9. Autonomic Nervous System (ANS) Testing.
10. **Neuro-electrodiagnostic techniques:** Nerve conduction study, Visual evoked potential (VEP), Brainstem auditory evoked potential (B.A.E.P), Somato-sensory evoked potential (SEP), Motor evoked potential (MEP).
11. Use of various test batteries for psychological evaluation of subject.

#### i. Sports Physiology

**Tests for physical fitness:** Cardio – respiratory responses to steady state exercise using:

- (i) Body Composition
- (ii) Conducting the Clinical Exercise Test
- (iii) Harvard step test
- (iv) Bicycle Ergometry
- (v) Treadmill test for determination of VO<sub>2</sub> max

#### j. Yoga and Meditation Physiology

- i. Physical, Mental and Emotional well being
- ii. Effect of yoga and pranayama on physiological parameters

- iii. Mindfulness
- iv. Concentration, anxiety and stress
- v. Counseling in health and diseases

#### **k. Others**

1. Construction of dietary chart for growing children, pregnant woman, elderly individuals, hypertensive patients, & diabetes mellitus patients.
2. Basic Life Support and Cardiac Life Support
3. Effective Digital presentation, medical photography, Good Clinical Practice, Humanities and Bioethics.

#### **iii. Amphibian (Frog) Experiments**

All animal experiments must be compliant with Government of India Regulations, notified from time to time). Experiments in Amphibian/Dog/Cat should be conducted by computer assisted simulation models/ facilities. Other experiments should be performed as permissible by CPCSEA guidelines.

Effect of temperature on simple muscle twitch.

1. Effect of two successive stimuli (of same strength) on skeletal muscle.
2. Effect of increasing strength of stimuli on skeletal muscle.
3. Effect of increasing frequency of stimuli on skeletal muscle (genesis of tetanus).
4. Effect of free load and after load on skeletal muscle.
5. Effect of repeated stimuli on skeletal muscle (study of phenomenon of Fatigue).
6. Study of isometric contraction in skeletal muscle.
7. Determination of conduction velocity of sciatic nerve and effect of variables on it.
8. Properties of cardiac muscle – Refractory period, All-or-None Law, extra-systole and compensatory pause, beneficial effect.
9. Regulation of Heart, Vagus dissection and effect of Vagal and WCL

stimulation.

10. Effect of physiological and pharmacological variables on intact frog's heart.

11. Perfusion of isolated frog's heart-role of sodium, potassium, calcium ions and drugs.

**B. The postgraduate student during the training period must ASSIST in the following procedures:**

### **Human Physiology**

#### **i. Cardiovascular system (CVS)**

- Cardiac TMT Holter Monitoring
- Collection and Assessment of Arterial blood gas

#### **ii. Nervous System including Special senses**

- Intra operative neuro monitoring (IONM)

**C. The postgraduate student during the training period must OBSERVE the following procedures:**

#### **i. Hematological profile**

- Determination of Absolute Eosinophil Count
- Study of Haemopoietic Cells present in the Bone Marrow
- Other high-end hematological investigations (specify): Flow cytometry, Platelet functions, D Dimers, coagulation profile etc.

#### **ii. Human Physiology**

##### **➤Cardiovascular system (CVS)**

- Echocardiography
- Central venous line insertion, CVP monitoring

##### **➤Respiratory system**

- Introduction to working of continuous positive airway pressure and Bilevel positive airway pressure (CPAP & BiPAP) Therapy
  - o Ventilator setting

➤ **Gastrointestinal system:**

- GI Manometry

➤ **Reproductive system**

- Ovulation study by using ultrasonography

➤ **Integrative Physiology / Excretory system**

- Pressure and PH studies in esophagus, stomach, intestine and rectum

➤ **Others**

- Genetic testing and introduction to procedural skills for clinical genetics/ prenatal diagnosis/ adult genetics - birth defects, genetic hematology, dysmorphology, skeletal dysplasia, neurological and muscular disorders, primary immunodeficiency diseases, autoimmune and multi-factorial disorders, biology and genetics of cancer.
- Interaction of human body in ambient environment - high altitude, space and deep sea
- Exercise & Sports physiology
- Integrated Physiology
- Yoga and Meditation
- Social responsibilities of physiologists
- Application of Artificial Intelligence in Physiology

**iii. Mammalian Experiments (Dog/Rabbit/Guinea pig/Rat/Mice)**

- General management of mammalian experiments.
- Recording of heart rate, blood pressure and respiration and study the effects of various factors; drugs; asphyxia; occlusion of common carotid artery.
- Effect of stimulation of central and peripheral end of vagus on arterial blood pressure and respiration after vagotomy.
- Effect of stimulation and distension of carotid sinus on blood pressure and respiration.
- Effect of stimulation of splanchnic nerve.
- Effect of stimulation of peripheral somatic nerve (sciatic nerve).

- Study of hypovolemic shock and its reversal.
- Perfusion of isolated mammalian heart and study the effects of drugs and ions.
- Recording of Isolated Intestinal movement and tone and studying the effect of drugs and ions.
- Study of various stages of menstrual cycle, cervical smear and vaginal smear.

### Departmental resources

#### 1. Clinical Neurophysiology Laboratory

The department should generate liaison with clinical department and provide routine services for health monitoring and diagnostics (disease).

- (i) Electroencephalography
- (ii) Evoked potential recording
- (iii) Electromyography
- (iv) Nerve conduction studies
- (v) Autonomic nervous system (ANS) testing
- (vi) Any other newer technology like Functional Near infrared spectroscopy (fNIRS), Intra operative neuro monitoring (IONM), polysomnography
- (vii) Diabetic neuropathy assessment kit
- (viii) Reaction time apparatus
- (ix) Electroretinography

#### 2. Cardio-Respiratory Laboratory

The department should generate liaison with clinical department and provide routine services for health monitoring and diagnostics (disease).

- (i) Electrocardiography
- (ii) Blood-gas Analysis
- (iii) Computerized multifunctional spirometry
- (iv) Laboratory for measuring pulmonary diffusion capacity and functional



residual capacity (FRC)

- (v) Whole-body plethysmography
- (vi) Laboratory for Blood flow measurements (Impedance plethysmograph/Laser flow meter/ Doppler flow meter)
- (vii) Ankle brachial pressure index/ Vascular Doppler

### **3. Exercise Physiology Laboratory**

The department should generate liaison with sports authorities and clinical departments to provide services for testing and grading exercise and physical efficiency for health monitoring and diagnostics (disease). This should be done by using the following techniques:

- (i) Two step test exerciser
- (ii) Bicycle Ergometry
- (iii) Tread mill
- (iv) Respiratory gas analysis and measurement of basal metabolic rate (BMR)

### **4. Metabolic/Endocrinology/Reproductive Bio-medicine laboratory**

This laboratory should perform various tests pertaining to gastrointestinal, renal, metabolic, endocrinal and reproductive bio-medicine. The department should generate liaison with clinical departments and provide routine services for health monitoring and diagnostics (disease).

1. Body Fat Analysis
2. Spectrophotometer
3. pH meter
4. Elisa Reader/Washer
5. Luminometer
6. Semi-autoanalyzer
7. Artificial reproductive techniques/ semen laboratory/ infertility laboratory

Post graduate students should be posted in the above laboratories and extend the required services on routine basis.

## TEACHING AND LEARNING METHODS

### General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skills oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

### Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used.

**A. Lectures:** Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. Salient features of Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

(Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institute.)

**B. Journal club:** Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the e-logbook.

**C. Student Seminar:** Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in- depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

**D. Student Symposium: Minimum of once every 3 months.**

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

**E. Laboratory work / Bedside clinics:** Minimum - once every 1-2 weeks.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching- learning sessions during clinical rounds.

**F. Interdepartmental colloquium**

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases.

**G. a. Rotational clinical / community / institutional postings**

- Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions including Medical Education Unit (MEU) or Department of Medical Education (DOME). The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to

be included in the specialty-based Guidelines.

- **Clinical Postings:** Compulsory clinical postings in following departments must be undertaken as per specified number of days in table 1 depicted below:

**Table 1:** Plan of Clinical postings for MD Physiology

<b>Prof Year</b>	<b>Department</b>	<b>Period of posting</b>	<b>Focus areas</b>
1 <sup>st</sup> year	Biochemistry	15 days	<p>1. Auto &amp; Semi auto Analyzer, Electrophoresis, Chromatography, RIA, Study of serum chemistry (proteins, Lipid, glucose, electrolytes, enzymes etc.) – 8 days</p> <p>2. Constituents of normal and abnormal urine, liver function tests, Renal function tests, Gastric function tests – 7 days</p>
1 <sup>st</sup> year	Pharmacology	20 days	<p>1. Animal House (to learn technique of Animal Handling, Blood sampling, anesthesia, Euthanasia, effective Analgesia and infection control after</p>

			<p>surgery. Study of Animal behavior like eating, drinking, locomotion, sexual activity etc.)</p> <p>2. Experimental Pharmacology lab to study ongoing animal experimental procedures including dissection for rat phrenic nerve hemidiaphragm and others – 10 days</p> <p>2. Study various guidelines related to ethical use of animals in experiments. To study preparation of different animal models and various tests to study physiological parameters. – 15 days</p>
1 <sup>st</sup> year	Pathology	30 days	<p>1. Blood bank - Cross matching, blood Storage, Immunohistochemistry, Immunological tests – 15 days</p> <p>2. Central Lab. - Tests for bleeding &amp; clotting disorders, study of Haemopoietic Cells present in the Bone Marrow – 10 days</p> <p>3. Semen analysis, determination of ovulation time by basal body temperature chart and pregnancy diagnostic tests – 5 days</p>
1 <sup>st</sup> year	Microbiology	10 days	<p>1. Fluorescent microscopy, use of Elisa reader &amp; Washer – 5 days</p> <p>2. Immuno-physiology and other facilities available in the dept. – 5 days</p>
2 <sup>nd</sup> year	Ophthalmology	15 days	<p>1. Direct and indirect Ophthalmoscopy, Retinoscopy – 8 days</p> <p>2. Slit lamp microscopy, Tonometry, Pachymetry, Study of corneal topology, Optometry, Auto-refractometer – 7 days</p>



2 <sup>nd</sup> year	Tuberculosis & Chest Disease (Pulmonary Medicine)	15 days	1. Whole body plethysmography – 8 days 2. Bronchoscopy & other facilities available in the dept. – 7 days
2 <sup>nd</sup> year	ENT	15 days	1. Audiometry – 7 days

			2. Oto-rhino-laryngoscopy, direct and Indirect Laryngoscopy, BERA, BSAEP – 8 days
3 <sup>rd</sup> year	General Medicine	20 days	1. TMT, Holter analysis, ABG, ECG – 10 days 2. EMG, NCV – 10 days
3 <sup>rd</sup> year	Psychiatry	10 days	1. EEG 2. Biofeedback
3 <sup>rd</sup> year	Casualty	15 Days	1. To know basics of how to handle emergency 2. Minor procedures

Every posting should have its defined learning objectives. It is recommended that the departments draw up objectives and guidelines for every posting offered in conjunction with the collaborating department/s or unit/s. This will ensure that students acquire expected competencies and are not considered as an additional helping hand for the department / unit in which they are posted. The PG student must be tagged along with those of other relevant departments for bedside case discussion/basic science exercises as needed, under the guidance of an assigned faculty.

#### **G b. Posting under DISTRICT RESIDENCY PROGRAMME (DRP)**

**Preamble:** Doctors have to be trained in diverse settings including those which are close to the community. Hence, they should be trained in the District Health System / the District Hospitals.

M.D./M.S. students admitted with effect from academic session 2021, the training imparted as part of the District Residency Programme, shall be considered as training imparted in a medical institution.

- **District Residency Programme:** All post-graduate students pursuing M.D./M.S. in broad specialties in all medical colleges/institutions under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduate programme.

This rotation shall be termed as ‘District Residency Programme’ (DRP) and the post-graduate medical student undergoing training shall be termed as a ‘District Resident’.

- **Training during DRP and Certification thereof:**

a. Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. Such monitoring systems shall also be accessible to the State/Union Territory Steering Committee and the National Coordination Cell.

b. The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.

c. Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective post-graduate course.

d. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to be decided by the PGMEB to the concerned medical college and the Govt. of the State/UT.

## **H. Teaching research skills**

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

### **I. Training in teaching skills**

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

### **J. Log book**

During the training period, the postgraduate student should maintain a Log Book indicating the duration of the postings/work done in the department and other areas of posting (as specified in table 1). This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The log book is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and acquisition of selected competencies.

The purpose of the Log Book is to:

- a) Help maintain a record of the work done during training,
- b) Enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
- c) Provide feedback and assess the progress of learning with experience gained periodically.
- d) The Log Book should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the

clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in log book particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the MCI e-logbook Guidelines uploaded on the Website.

#### **K. Course in Research Methodology**

- a. All post-graduate students shall complete an NPTEL course in Research Methodology.
- b. The students shall have to register on the portal of the designated training institutions.
- c. The students are expected to **complete the course in the first year.**
- d. The online certificate generated on successful completion of the course and examination thereafter, will be acceptable evidence of having completed this course.
- e. The above certification shall be a mandatory requirement to be eligible to appear for the final examination of the respective post-graduate course.
- f. This requirement shall be applicable for all post-graduate students.

#### **L. Course in Ethics**

- a. All post-graduate students shall complete course in ethics including Good Clinical Practices and Good Laboratory Practices, whichever is relevant to them, to be conducted by institutions/Universities.
- b. The students are expected to complete the course in the first year.
- c. No post-graduate student shall be permitted to appear in the examination without the above certification.

### **M. Course in Cardiac Life Support Skills**

- a. All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institution.
- b. The students are expected to complete the course in the first year.
- c. No post-graduate student shall be permitted to appear in the examination without the above certification.

**N.** A post-graduate student of a degree course in broad specialty/super specialty will do at least one in each following categories to make him/her eligible to appear in his/her final examination:

- a. Minimum one Poster presentation at a National/Zonal/State conference of his/her speciality;
- b. At least one Podium presentation at a National/Zonal/State conference of his/her speciality;
- c. At least one research paper published/accepted for publication in journal of his/her speciality as first author

### **O. Other aspects**

Institutions may arrange training in any other courses like awareness in medical audit, medical law, exposure to human behaviour studies, finance, accounts, etc, which are beneficial to the postgraduate students.

## **ASSESSMENT**

**Examinations:** The medical college/institution will conduct the Formative Assessment (examination) and the University will conduct the Summative Assessment (examination).

Both Formative Assessment (examination) and Summative Assessment (examination). shall consist of Theory, Clinical/Practical and Viva Voce. The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 8 months between the two examinations.



## **FORMATIVE ASSESSMENT:**

Formative assessment should be continual and should assess medical knowledge, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

### **General Principles**

Internal Assessment should cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

There shall be Three Internal Examinations both Theory and Practical as per the format of summative examination as follows:

1. I Internal Examination at the end of 1<sup>st</sup> year,
2. II Internal Examination at the end of 2<sup>nd</sup> year and
3. Preliminary examination at the end of 3<sup>rd</sup> year.

## **SUMMATIVE ASSESSMENT:**

### **Eligibility Criteria for Post Graduate student for appearing in University Examination –**

Candidates will be permitted to appear for examination only if attendance (Minimum 80% in each calendar year) and internal assessment are satisfactory and dissertation is accepted.

1. Have minimum one Poster Presentation or Podium presentation at a National/Zonal/State conference of his/her specialty
2. Have minimum one Research paper published in journal of his/her specialty as first author.
3. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
4. Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.

5. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
6. Thesis acceptance by all evaluators before the conduct of University Examination.

The summative examination would be carried out as per the Rules given in the latest PGMER December 2023. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

The postgraduate examination shall be in three parts:

### 1. Thesis

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of two examiners. A postgraduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

### 2. Theory examination

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify postgraduate student's level of knowledge, skill and competence at the end of the training, as given in the latest PGMER December 2023. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3<sup>rd</sup> academic year.

### 3. Practical/clinical and Oral/viva voce examination

#### Practical examination

Practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain.

**Oral/Viva voce examination** on defined areas should be conducted by each examiner **separately**. Oral examination shall be comprehensive enough to test the postgraduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

## Scheme of Examination

SL No	Description	MD Physiology
1	<b>THEORY</b>	
	No of Theory Paper	4
	Marks for each Theory Paper	100
	Total marks for Theory Paper	400
	Passing Minimum for Theory	200/400 (40% minimum in each paper and aggregate of 50% in theory to declared pass in theory)
2	<b>PRACTICAL</b>	300
	• Dissertation	20 marks
	• OSPE	25 (5 stations x 5 marks)
	• Subject specific assessment	255
3	<b>VIVA VOCE</b>	100
	Passing minimum for Practical including Viva voce	200/400
	<p>The candidate shall secure not less than 50% marks in each head of passing which shall include</p> <p>(1) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)</p> <p>(2) Practical/Clinical and Viva voce - aggregate 50%</p> <p>(3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.</p> <p>(4) 5 per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. External examiner outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce.</p> <p>(5) No grace mark is permitted in post-graduate examination either for theory or for practical</p>	

- **Dissertation**

Postgraduate student shall present his or her dissertation work for 10 minutes which will be evaluated and followed by discussion by all examiners.

- **OSPE** - Five stations including procedure and question stations will be kept and observed and evaluated by examiners.
- **Pedagogy** – Student will be given a topic to present to assess his/her teaching skills.

**There shall be 4 theory papers each of three hours duration and each paper shall have TEN short essay questions of 10 marks (10x10=100).**

**Preferably case-based questions.**

Paper	Syllabus
-------	----------

Paper I	Basic sciences as applied to the subject (General and Cellular Physiology and Genetic basis and historical perspectives)
Paper II	Systemic Physiology (system providing transport, nutrition and energy) and comparative Physiology
Paper III	Systemic Physiology (system concerned with regulation, neural control and procreation)
Paper IV	Recent advances in the subject (including applied Physiology)

**Note:** The distribution of chapters/topics shown against the papers are suggestive only and may overlap or change.

**Questions on recent advances may be asked in any or all papers.**

**Note: The distribution of chapters / topics shown on the papers are suggestive only and may overlap or change.**

### **3. Practical and oral/viva voce examination:**

#### **Practical examination: 300 marks**

The practical examination should be spread over two days and include various major components of the syllabus focusing mainly on the psychomotor domain. One day should be for conducting practical examination including table viva that will focus on the nuances of laboratory techniques and quality assurance.

**The practical examination should include:**

#### **B. Practical Examination: 300 Marks**

- |                                                         |          |
|---------------------------------------------------------|----------|
| i) Clinical Physiology                                  | 75 Marks |
| Clinical examination of a given subject                 |          |
| Discussion on investigations                            |          |
| Interpretation of laboratory findings                   |          |
| Physiological principles in diagnosis                   |          |
| ii) Human experiment                                    | 50 Marks |
| iii) Hematology                                         | 40 Marks |
| iv) Amphibian & Mammalian                               | 30 Marks |
| v) Neuro-electrodiagnostic/ANS/Sports Physiology -Tests | 40 Marks |

vi) OSPE	25 Marks
vii) Dissertation	20 Marks
viii) Pedagogy	20 Marks

**C. Viva-voce Examination: 100 Marks**

**Recommended Reading:**

**Books (latest edition)**

1. A.C. Guyton – Text book of Medical Physiology
2. W.F. Ganong – Review of Medical Physiology
3. William's Textbook of Endocrinology
4. J.E. Cotes- Respiratory Physiology
5. D.T. Harris – Experimental Physiology
6. Wintrobe's – Clinical Hematology
7. Principles of medical physiology by Sircar
8. Brown B.L. – Cell signaling, Biology and medicine of signal transduction
9. Berne and Levy- Medical Physiology
10. Textbook of Medicine by Harrison
11. Principles of Neural sciences edited by E. R. Kandel, J. H. Schwartz and T. M. Jessell
12. Williams Hematology edi. by M.A. Lichtman, E. Beutler, K. Kaushansky, T.J. Kipps, U. Seligsohn, J. Prchal
13. Medical Physiology: by W. F. Boron and E. L. Boulpaep
14. Medical Physiology: by A. Rhodes and G. A. Tanner
15. Neuroscience : by Dale Purves

**Practical Books:**

1. Hutchison's Clinical Methods: An Integrated Approach to Clinical Practice.

2. Macleod's clinical Examination
3. Textbook of Practical Physiology: by Dr. G. K. Pal and Dr. Pravati Pal
4. Textbook of Practical Physiology: by Dr. C. L. Ghai
5. Textbook of Practical Physiology: by Dr. Ranade
6. Textbook of Practical Physiology: by Dr. A. K. Jain

#### **Journals:**

**03-05 International Journals and 02 National (all indexed) journals**



## Annexure 1

Student appraisal form for MD in Physiology											
	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic aptitude and learning</b>										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work-based assessments										
1.6	Self-directed Learning										
<b>2</b>	<b>Work related to training</b>										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality										

	improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of training										

<b>3</b>	<b>Professional attributes</b>										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
<b>4</b>	<b>Space for additional comments</b>										
<b>5</b>	<b>Disposition</b>										
	Has this assessment pattern been discussed with the trainee?	Y es	N o								
	If not explain.										
	Name and Signature of the assessee										
	Name and Signature of the assessor										
	Date										

**COMPETENCY BASED  
POSTGRADUATE TRAINING PROGRAMME FOR  
MD IN BIOCHEMISTRY**

## **M.D. BIOCHEMISTRY**

### **Preamble**

A competency is the capability to apply or use a set of related knowledge, skills, and abilities required to successfully perform "critical work functions" or tasks in a defined work setting. Competency-based training is a learning model in which the required level of knowledge and skill (competency) on a task must be demonstrated. The purpose of the competency-based postgraduate education in Biochemistry is to create specialists, with the required knowledge, skills, and attitude, who would provide high-quality healthcare complying with the principles of personal integrity and professional ethics and would advance the cause of science through teaching, research & training along with constant updating of his/her knowledge and skills as a lifelong self-directed learner.

The student, after undergoing training in MD Biochemistry, should be able to demonstrate his/her knowledge of the basic concepts and recent advances in the subject, and a defined set of skills including expertise in various laboratory techniques applicable to metabolic and molecular aspects of medicine, planning and executing research projects, writing research papers/ articles demonstrating the acquired training in research methodology. The postgraduate training course should equip the student with skills to become a competent teacher who is also able to demonstrate his/her competence in planning teaching programs and apply those to facilitate the learning of the students in medical and allied health science courses in compliance with the curriculum while advancing the same with needful and feasible innovations. He/she should demonstrate competence in integrating teaching- learning of Biochemistry with other relevant subjects/disciplines to facilitate the holistic application of the subject of Biochemistry in patient care. He/she should be able to demonstrate his/her training in good laboratory practices with the ability to set up/manage a quality-controlled and quality-assured diagnostic laboratory, generate, evaluate, interpret and report the diagnostic laboratory data, with a good understanding of the sources of errors, corrective and preventive actions, hospital and laboratory information system network, and interact with clinicians as may be needed for effective patient care.

This document aims to provide teachers and learners with comprehensive guidelines to achieve a defined set of outcomes through learning and assessment and apply those in a given setup. This document has been framed by the Expert Group of the National Medical Commission with an aim to render a uniform PG medical curriculum to be implemented by all the medical colleges in the country. The curriculum so designed has been named the competency-based PG medical education curriculum in conformity with the purpose and content of PG medical education.

### **Goal:**

The postgraduate course M. D. (Biochemistry) should enable a student to acquire in depth knowledge in basic concepts of biochemistry, recent advances in the subject and skills and expertise in various laboratory techniques applicable to metabolic and molecular aspects of medicine and in research methodology

### ***SUBJECT-SPECIFIC LEARNING OBJECTIVES***

The goal of the training program in MD Biochemistry is to enable a student to become a competent teacher/facilitator of teaching-learning processes, researcher, problem solver, and healthcare provider. He/ she should be able to acquire a defined set of cognition and skills as detailed below and demonstrate his ability to apply the same in a given healthcare setup.

#### **A. Acquisition of Knowledge**

The student should be able to explain the molecular, physical, and physiological logic of the processes involved in the maintenance of normal health and their deviation in a disease state. He/she should be able to integrate his/her acquired knowledge in principles and concepts of classical biochemistry, biophysics, and molecular biology, comprehend and apply his/her cognition and skills in a professional patient care setup.

#### **B. Acquisition of Skills**

The student should be able to facilitate the UG and PG learning of biochemical concepts and principles and should be able to render hands-on training in the Biochemical laboratory investigations and experimentations relevant to the strengthening of biochemical concepts, scientific and clinical problem-solving, and biomedical research. He/she should be able to analyze, interpret and evaluate the data, and rationalize their application in clinical management and experimental research.

#### **C. Teaching and training**

As a competent healthcare personnel, the student should develop his/her learning skills by applying the fundamental principles of medical education, through teaching and assessing the undergraduate students in medicine and allied health science courses and, by contributing to the training of postgraduate students.

#### **D. Diagnostic laboratory skills**

The student should be competent in setting up/supervising/managing a diagnostic laboratory in Biochemistry in a hospital or in any other setup (diagnostic units in remote places or independent of a hospital setting) ensuring quality control along with quality assurance and providing reliable healthcare support services. The student should be able to provide consultation to clinicians and also contribute to community healthcare by conducting screening tests.



## **E. Professionalism, Ethics, Communication skills**

The student should be able to develop and sustain work ethics and empathetic behavior with students and colleagues. He/she should be able to demonstrate professional integrity, honesty, and higher ethical standards and be able to display appropriate attitude and communication skills to interact with colleagues, teachers, students, laboratory personnel, and other healthcare professionals. While dealing with the patients and their relatives, he/she should exhibit compassion, care, and concern.

## **F. Research**

The student should be able to demonstrate his/her competence in carrying out research work and related activities from the planning phase to writing (dissertation/thesis, research report/research paper) by applying the principles of research methodology.

### ***LEARNING OBJECTIVES***

At the end of three years of training in the MD Biochemistry course, a postgraduate student should be able to:

- Demonstrate his/her knowledge of Biochemistry, Cell Biology, Molecular Biology, Molecular diagnostics, Biophysics, and applied aspects of all the mentioned branches to contribute to the teaching-learning processes and healthcare management.
- Identify learning needs and set the learning objectives for his/her self-directed learning and acquire and apply the needful learning in subjects like Genetics, Nutrition & Dietetics, Immunochemistry, and Laboratory Medicine in a relevant context.
- Apply the Medical Education principles to effectively contribute to Teaching-Learning processes, Assessment & Integrated learning.
- Demonstrate his/her knowledge about various aspects of the Competency-based UG medical education implemented w.e.f academic year 2019-20.
- Explain, comprehend and analyze the basics of Cellular and Molecular Biochemistry, functional mechanisms of the biomolecules and their logistics in the human body in normal health and their deviations in the disease conditions. He/she should be able to integrate his/her cognition and skills to facilitate medical education for undergraduate, postgraduate, and allied health sciences students and for patient management.
- Demonstrate administrative, decision-making, group activity, teamwork, and leadership skills in (a) setting up a department in the medical institution and (b) diagnostic services in the hospital and managing them as a part of the healthcare team.
- Analyze, interpret and evaluate laboratory data and provide consultancy to the clinician for judicious use of lab tests, with appropriate interpretation whenever needed, to facilitate the diagnosis, treatment, follow-up, and overall management of patients.
- Conduct research and related activities in the field of Biochemistry, Clinical Biochemistry, Molecular diagnostics, and Medical Education.
- Analyze, interpret, evaluate, appraise and present research-related data and publications to identify the best clinical evidence for research and demonstrate his/her competence in scientific /clinical work presentation.

- Describe the principles of evidence-based medicine, evidence-based practice, good laboratory practice, and good clinical practice.
- Communicate effectively to fellow colleagues, teachers, patients & their relatives and other healthcare members for providing services to the community.
- Actively participate in all the teaching-learning-related activities like CMEs/workshops/conferences/hands-on-training/Interdepartmental meets/clinical meetings and acquire interpersonal skills.

### ***SUBJECT/DOMAIN-SPECIFIC COMPETENCIES***

**At the end of three years training course, the postgraduate student should be able to demonstrate the competencies under the following three domains:**

#### **A. Cognitive domain (Knowledge domain)**

1. Describe the biochemical principles and mechanisms to define and explain a healthy, and a diseased state, and execute the application of the biochemical mechanisms in the perception, diagnosis, and treatment of a disease.
2. Describe the biomolecules and their importance in sustaining life processes.
3. Explain the concept of intermediary metabolism, energy transactions, and metabolic and molecular homeostasis in the sustenance of life.
4. Explain the characteristics, components, and functional significance of different metabolic pathways, their specific intermediates, their inter-conversions, pathway-specific, organ-specific, and interrelated regulation of metabolic pathways, and apply that in explaining the biochemical logic in the functioning of the body in health and disease.
5. Describe and apply the concept of nutrition in health and disease, and critically evaluate the role of essential micro- and macro-nutrients, and their interlinks with cellular metabolism.
6. Apply the integrated knowledge and understanding of biochemical principles and mechanisms in clinical problem-solving.
7. Demonstrate knowledge of genetic engineering in various fields of medicine.
8. Apply the principles of biostatistics in research, clinical laboratory practices, community-based health data collection, and epidemiological surveys.
9. Demonstrate knowledge of the establishment of a diagnostic laboratory and its accreditation process.

10. Analyze, interpret and evaluate biochemical laboratory findings in integration with therelevant clinical data to evaluate, analyze and monitor a disease state.
11. Apply the knowledge acquired in the basic principles of research methodology to develop a research protocol.
12. Make use of the latest available statistical tools for analyzing the research data, and interpreting and disseminating the results.
13. Demonstrate familiarity with the advances in artificial intelligence and computer-based modeling as and when required.
14. Describe and implement various components of the Competency-based UG Medical Education.
15. Apply the principles of teaching-learning technology while taking interactive classroom lectures, prepare modules for case-based learning (CBL) and problem-based learning (PBL), organize and conduct CBLs/PBLs, case discussions, small group discussions, seminars, journal clubs, and research presentations.
16. Explain the principles of instrumentation and their automation in the Biochemistry laboratory and demonstrate knowledge about the latest advances in technology.
17. Exhibit knowledge of professional ethics and integrity in his/her day-to-day conduct and services rendered.
18. Apply the updated knowledge to suggest and implement judicious use of clinical laboratory investigations.
19. Demonstrate knowledge on the use of laboratory gadgets and instruments taking necessary precautions.
20. Demonstrate knowledge on the preparation of solutions and reagents with necessary precautions as may be required for the estimations in experimental and diagnostic laboratories.
21. Display knowledge about recent advances and trends in the core subject area, research, and laboratory practice along with point-of-care testing (POCT) in the field of biochemistry.

**B. Affective domain (Attitudes including Communication and Professionalism)**

1. Communicate appropriately with peers, teachers, healthcare professionals, and patients coming from a variety of backgrounds to explain the molecular and metabolic basis of health and disease in integration with lifestyle management.
2. Demonstrate care, concern, respect, empathy, and compassion while

- dealing with patients and their relatives at any point of interaction.
3. Demonstrate progressive improvement in AETCOM in routine endeavors through self-assessment, feedback from the peers, stakeholders and adapting to relevant learning.
  4. Explain effectively to the patients/their relatives the precautions and preparations needed for them to comply with for specific biochemical analysis/laboratory tests that they will be subjected to.
  5. Ensure that the related technical staff is apprised of the above and is duly trained while dealing with the patients.
  6. Apply ethical principles and display proper etiquette in dealing with patients, relatives, and other health personnel.
  7. Demonstrate appropriate attitude and ethical behavior in exchanging feedback with peers, teachers, clinicians, patients, and their relatives.
  8. Display ethical behavior, and personal and professional integrity in his/her conduct and services.
  9. Demonstrate the ability to maintain confidentiality in declaring the laboratory results to the concerned personnel wherever applicable.
  10. Display awareness and respect for the rights of the patients.
  11. Demonstrate counseling skills, especially in the context of nutritional and genetic counseling.
  12. Demonstrate competency in judicious decision-making free from personal beliefs/thoughts, pride, and prejudice and, that, no such limitations impact his/her professional performance.

### **C. Psychomotor domain**

13. Demonstrate the principles and facts of cellular and molecular biochemistry by performing relevant laboratory exercises and analytical tests on body fluids, and other biologically important substances, along with documentation of the test procedures, results, and interpretation of findings.
14. Develop a differential diagnosis, wherever applicable, based on the results obtained after performing the requisite tests.
15. Plan & conduct lectures, practical demonstrations, tutorial classes, and case-based or problem-based small group discussions for undergraduate students of medical and allied disciplines.
16. Identify, select and perform various biochemical tests in the clinical laboratory which are useful in the diagnosis, treatment, follow-up, and overall management of diseases and be able to interpret the results of

such tests.

17. Perform relevant biochemical, immunological, and molecular biology techniques, wherever applicable.
18. Demonstrate compliance with the standard operating procedures of various methods and techniques used in a clinical biochemistry laboratory.
19. Perform enzymatic assays and conduct experiments to study enzyme kinetics affirming the ability to discuss, interpret and document the related data.
20. Perform routine investigations in hematology and microbiology, as and when required.
21. Demonstrate presentation skills at academic meetings and scientific paper writing skills.
22. Prepare research protocols and conduct relevant experimental studies.
23. Analyze and solve clinical and experimental problems.

**By the end of the course, the postgraduate student should be able to demonstrate his competency in performing the following procedures independently:**

- Demonstrate the use of all the routine glassware/equipment used in UG teaching- learning in Biochemistry (as per MSR) and advanced instruments used in the clinical laboratory attached to the respective hospital for patient care.
- Preparation of buffers, normal laboratory solutions like molar/molal/normal and reagents with validation.
- Perform all the undergraduate practicals as per the new competency-based medical education prescribed by NMV
- Perform experiments to study selected reactions of carbohydrates, amino acids and proteins, and lipids.
- Perform experiments to demonstrate constituents of milk.
- Perform experiments to demonstrate normal and abnormal constituents of urine.
- Perform Paper chromatography for separation of amino acids.
- Determination of enzyme activity and study of enzyme kinetics, using any two suitable enzymes (e.g., alkaline phosphatase from any liver tissue or acid phosphatase from potatoes).
- Plot standard curve for different estimations.

- Estimate (including calibration) and interpret clinical analytes as detailed below:
  - Blood glucose, glycated hemoglobin, the performance of glucose tolerance test and glucose challenge test,
  - Total protein, albumin, and A:G ratio,
  - Electrolytes, arterial blood gas analysis,
  - Cholesterol, triglycerides, free fatty acids, low-density lipoprotein cholesterol (LDL-C), high-density lipoprotein cholesterol (HDL-C), phospholipids, Lp(a), and calculated parameters under lipid profile,
  - Amylase, lipase,
  - Urea, creatinine, uric acid, urinary microalbumin,
  - Parameters of liver function tests (bilirubin, hepato-biliary enzymes such as AST, ALT, ALP, GGT, serum proteins/albumin and prothrombin time, CRP),
  - Calcium, magnesium, phosphorus, copper (and ceruloplasmin), serum iron, TIBC, and ferritin,
  - Markers of myocardial damage (CK, CK-MB, troponins, LDH),
  - Vitamin D, B12, and folate,
  - Point-of-care testing (POCT).
- Electrophoresis of serum proteins, lipoproteins,
- Separation and molecular weight determination of proteins by SDS-PAGE,
- Electrophoretic separation of LDH isozymes or any other isoenzymes,
- Hb electrophoresis,
- Renal clearance tests,
- CSF and other body fluid analysis,
- Stone analysis,
- Thyroid function tests, Tumor markers, and relevant hormone assays by ELISA/RIA/Chemiluminescence.

### ***Clinical Laboratory***

- Demonstrate familiarity with the essentials of a clinical laboratory setup, the working of autoanalyzer, data transfer, statistical considerations, authorizing and reporting results in an advanced clinical laboratory with an ability to enlist the possible sources of errors (pre-analytical, analytical and post-analytical), perform root cause analysis, and undertake corrective actions, and preventive actions(CAPA).
- Perform and demonstrate activities under total quality management (TQM) of the Laboratory:



- a. Specimen collection, handling, processing, and storage of the sample.
  - b. Methods of standardization & calibration.
  - c. Methods of quality control, quality assurance, CAPA & assessment.
- Demonstrate ability to prepare and interpret a Levy-Jennings chart and plot inter-assay and intra-assay variation for any analyte estimated in the laboratory.
- Implementation and interpretation of Westgard rules followed by their CAPA, as required.
- Determination of reference values for any one parameter for the clinical laboratory.
- Perform inter-instrumental comparison for at least four parameters.
- Perform in-house calibration of pipettes, centrifuge, hot-air oven, thermometer, and thermo-hygrometer.
- Student should undergo internal auditor training as per ISO 15189:2012, NABL (optional).
- Able to prepare a lab quality manual and frame relevant Standard Operating Procedure (SOP) and Work Desk Instructions (WDI), for every procedure followed in a clinical lab.

### ***Molecular laboratory techniques***

The student should be able to perform the following:

- Isolation of genomic DNA from blood,
- Isolation of RNA, synthesis of cDNA by reverse transcription,
- PCR and Reverse transcriptase PCR (both conventional and real-time),
- Primer designing,
- Blotting techniques,
- Basic techniques and principles of protein/enzyme purification and determining homogeneity.

**By the end of the course, the postgraduate student should be able to perform under supervision or, demonstrate familiarity with, as the case may be, the following procedures (at least any five):**

1. Separation of peripheral blood leukocytes using relevant isolation technique,
2. Subcellular fractionation/marker enzymes for organelles to demonstrate fractionation and purity of the fraction,
3. Ultracentrifugation,

4. Isolation of plasmids,
5. Basic techniques and essentials in cell culture and establishing different cell culture facilities,
6. High-performance liquid chromatography (HPLC)/GC-MS/LC-MS,
7. Restriction fragment length polymorphism (RFLP),
8. Fluorescent in-situ hybridization (FISH),
9. DNA fingerprinting,
10. Immunodiffusion techniques,
11. Immuno-electrophoresis,
12. Therapeutic drug monitoring,
13. Flow cytometry,
14. Nephelometry,
15. HLA typing.

### ***SYLLABUS***

**The course contents are outlined below:**

#### **A. Cognitive Domain**

**Biomolecules, Principles of Biophysics and its biomedical importance, Cell biology, Fluid, electrolyte and acid-base balance, Analytical techniques and instrumentation, Biostatistics and research methodology, Basics of medical education in teaching and assessment of Biochemistry.**

#### **BIOMOLECULES**

Ionization of water, the concept of acid and base, weak acids and bases, pH, pK, Henderson-Hasselbalch equation, buffer and buffering capacity.

#### **Proteins:**

- Classification, structure, properties and functions of amino acids and peptides, biologically important peptides,
- Classification, biological significance and structural organization of proteins,

- Structure-function relationship of proteins (haemoglobin, myoglobin, collagen and immunoglobulins),
- Fractionation, purification, structural analysis and characterization of proteins,
- Protein folding and its associated disorders,
- Protein denaturation,
- Protein degradation – lysosomal and proteosomal,
- Plasma proteins.

#### **Carbohydrates:**

- Classification, biomedical importance, functions, properties and reactions of carbohydrates,
- Structural aspects of monosaccharides, disaccharides and polysaccharides,
- Mucopolysaccharides/glycosaminoglycans, glycoproteins and glycolipids,
- Glycation, glycosylation and role of carbohydrates in blood group substances.

#### **Lipids:**

- Types, properties and biomedical importance of lipids,
- Fatty acids - nomenclature, classification, properties, reactions including essential fatty acids, polyunsaturated fatty acids and trans fatty acids,
- Mono, di- and triacylglycerols,
- Trans fats,
- Cholesterol - structure, properties and biomedical importance,
- Phospholipids – classification, properties, composition, and biomedical importance of various phospholipids,
- Glycolipids – classification, properties, composition, and biomedical importance,
- Lipoproteins – classification, properties, composition, and functions of various lipoproteins including the role of apoproteins, their importance in health and disease,
- Role of lipids in the structure and function of biological membranes,
- Structure, properties, and biomedical applications of micelles and liposomes.

#### **Nucleotides and nucleic acids:**

- Purine and pyrimidine bases in DNA and RNA,
- Nucleosides and nucleotides,
- Biologically important nucleotides (including synthetic analogs of

- purine/pyrimidine bases and nucleosides used as therapeutic agents),
- Structure, functions, properties, and types of DNA and RNA.

## **PRINCIPLES OF BIOPHYSICS AND ITS BIOMEDICAL IMPORTANCE**

- Diffusion, osmosis, dialysis, surface tension, viscosity, colloids, crystalloids, and suspensions.

## **CELL BIOLOGY**

- Structural organization and functions of a biological cell and different subcellular organelles along with their marker enzymes,
- Molecular organization, functions, and structure-function relationship of a cell membrane,
- Solute transport across biological membranes with related disorders,
- Cell fractionation and separation of organelles,
- Disorders related to cell membrane and subcellular organelles,
- Intracellular traffic and sorting of proteins,
- Intracellular signaling pathways, membrane receptors and second messenger,
- Intercellular junctions, cellular adhesion molecules, intercellular signaling and communication,
- Extracellular matrix: composition, and biomedical importance,
- Components of the cytoskeleton, and their role in muscle contraction and cell motility,
- Cell cycle, its regulation, and mechanism of cell death,
- Structure and functions of specialized cells.

## **FLUID, ELECTROLYTE, AND ACID-BASE BALANCE**

- Fluid, electrolyte, and acid-base balance, mechanism of regulation and associated disorders.

## **ANALYTICAL TECHNIQUES AND INSTRUMENTATION**

- Colorimetry
- Spectrophotometry
- Atomic absorption spectrophotometry
- Flame photometry

- Fluorometry
- Turbidimetry and nephelometry
- Gravimetry
- Electrochemistry (pH electrodes, ion-selective electrodes, gas-sensing electrodes, enzyme electrodes)
- Chemical sensors (biosensors)
- Osmometry
- Chemiluminescence
- Water quality testing (TDS, pH, fluoride) for autoanalyzer
- Electrophoresis (principle, types, applications; isoelectric focusing, capillary electrophoresis; 2-D electrophoresis)
- Chromatography [principle, types (including high-performance liquid chromatography and gas chromatography)]
- Mass spectrometry
- Immunochemical techniques
- Techniques in molecular biology
- Nanotechnology and microfabrication
- Techniques to study *in vivo* metabolism (NMR, SPECT, PET scan, etc.)
- Radioisotope-based-techniques and their applications (permissions, precautions, management of radioactive waste)
- Automation
- Point-of-care testing

## **BIOSTATISTICS AND RESEARCH METHODOLOGY**

- Basic concepts of biostatistics as applied to health science,
- Statistical tests: t-test, analysis of variance, chi-square test, non-parametric tests, correlation and regression,
- Statistical methods of validation of diagnostic tests,
- Types of study designs and sampling methodologies,
- Meta-analysis and systematic reviews,

- Planning and management of research,
- Electronic search of the literature,
- Ethical aspects related to research and publication,
- Brief introduction of software for data analysis,
- Essentials of intellectual property rights, patents and copyrights.

## **BASICS OF MEDICAL EDUCATION IN TEACHING-LEARNING AND ASSESSMENT OF BIOCHEMISTRY**

- Group dynamics,
- Principles of adult learning, the taxonomy of learning,
- Curriculum planning,
- Educational objectives,
- Developing a lesson plan (appropriate to the objective and teaching learning method),
- Interactive and innovative teaching methods for large and small groups,
- Use of appropriate media (for a learning session),
- Principles of self-directed learning and giving feedback,
- Framing appropriate essay questions, short answer questions and multiple-choice questions,
- Item analysis and preparation of question bank,
- Principles and types of assessment,
- Methods of assessing cognitive skills, psychomotor skills, communication skills, and professionalism (including viva voce and OSPE),
- Developing a plan for internal assessment and formative assessment,
- Preparation of blueprint and setting of question paper,
- Microteaching,
- Reflection writing.

## **Enzymes, Bioenergetics, Biological oxidation, Intermediary metabolism and inborn**



**errors of metabolism, Nutrition, Vitamins and Minerals, Detoxification and metabolism of xenobiotics, Free radicals and anti-oxidant defense systems**

## **ENZYMES**

- Properties, classification, mechanism of action, coenzymes and cofactors, proenzymes, ribozymes, nanozymes, catalytic antibodies,
- Factors affecting the rate of enzyme-catalyzed reaction,
- Kinetics of enzyme activity, regulation of enzyme activity,
- Isoenzymes and isoforms, role in metabolic regulation,
- Enzyme inhibition,
- Principles of enzyme assays,
- Applications of enzymes: diagnostic, therapeutic and commercial uses of enzymes,
- Enzymes as targets for drug development.

## **BIOENERGETICS**

- Basic concepts of thermodynamics and its laws, as applicable to living systems,
- Exergonic and endergonic reactions and coupled reactions, redox potential,
- High energy compounds,
- Enzymes of biological oxidation,
- Cytochromes.

## **BIOLOGICAL OXIDATION**

- Components, complexes and functioning of the respiratory chain including inhibitors,
- Process and regulation of oxidative phosphorylation including uncouplers,
- Mechanisms of ATP synthesis and regulation,
- Mitochondrial transport systems and shuttles,
- Mitochondrial diseases

## **INTERMEDIARY METABOLISM AND INBORN ERROR OF METABOLISM**

### **Metabolism of carbohydrates:**

- Digestion and absorption including associated disorders
- Glycolysis and TCA (Kreb's cycle), including regulation
- Glycogen metabolism and its regulation
- Cori cycle, gluconeogenesis and its regulation
- Metabolism of fructose and galactose and their clinical significance
- Pentose phosphate /HMP shunt pathway and uronic acid pathways and their clinical significance
- Polyol/sorbitol pathway
- Regulation of blood glucose, hyperglycemia, hypoglycemia and their clinical significance
- Glucose tolerance test and its interpretation
- Diabetes mellitus – classification, pathogenesis, metabolic derangements and complications, diagnostic criteria and laboratory investigations, principles of treatment (including diet and lifestyle modification)
- Inborn errors and disorders of carbohydrate metabolism.

### **Metabolism of Lipids:**

- Digestion and absorption and associated disorders
- Metabolism of fatty acids, regulation and related disorders
- Metabolism of eicosanoids and their clinical significance
- Metabolism of triacylglycerol, storage and mobilization of fats
- Metabolism of adipose tissue and its regulation
- Metabolism of cholesterol including its transport and hypercholesterolemia
- Metabolism of lipoproteins, atherosclerosis, fatty liver and lipid profile
- Metabolism of methanol and ethanol
- Role of liver in lipid metabolism
- Metabolism of phospholipids and associated disorders

- Metabolism of glycolipids and associated disorders
- Inborn errors of lipid metabolism

#### **Metabolism of amino acids and proteins:**

- Digestion, absorption and associated disorders
- Deamination, transamination, disposal of the amino group, catabolism of the carbonskeleton of amino acids
- Formation and disposal of ammonia (including urea cycle) and related disorders and ammonia toxicity
- Metabolism of individual amino acids and associated disorders
- One carbon metabolism
- Biogenic amines
- Inborn errors of amino acid metabolism

#### **Metabolism of nucleotides:**

- Metabolism of purines and pyrimidines and their associated disorders.

#### **Metabolism of haem:**

- Metabolism of haem and associated disorders.

#### **Inter organ and intra organ interrelationships and integration of metabolic pathways:**

- Metabolic adaptation in starvation, diabetes mellitus, obesity, and during exercise.

### **NUTRITION**

- Calorific value, Basal Metabolic Rate (BMR), Specific dynamic action (SDA) of food.
- Nutritional importance of proximate principles of food including sources and RDA.
- Glycemic index.

- Biological value of proteins and nitrogen balance.
- Thermogenic effect of food.
- General nutritional requirements.
- Balanced diet, diet formulations in health and disease, mixed diet.
- Calculation of energy requirements and prescribing diet.
- Nutritional supplements and parenteral nutrition.
- Food toxins and additives.
- Disorders of nutrition, obesity, protein energy malnutrition, under-nutrition and laboratory diagnosis of nutritional disorders.
- National Nutrition Programme.

## **VITAMINS AND MINERALS**

- Structure, functions, sources, RDA, and metabolism of vitamins and minerals and their associated disorders.

## **DETOXIFICATION AND METABOLISM OF XENOBIOTICS FREE RADICALS AND ANTI-OXIDANT DEFENSE SYSTEMS**

- Detoxification: Phase –I reactions and Phase-II reactions: Oxidation, Hydroxylation, reduction, hydrolysis, Acetylation, Methylation, and Conjugation reactions - Glucuronic acid, Glutathione, Glycine.
- Xenobiotics and disease caused.
- Biotransformation
- Cytochrome P450 system
- Free radicals and anti-oxidant defense systems in the body.
- Associations of free radicals with disease processes.
- Oxygen toxicity.
- Oxidative stress markers in blood, urine, and other biological fluids.

## **Molecular biology, Molecular and genetic aspects of cancer, Immunology, and Environmental Biochemistry**

### **MOLECULAR BIOLOGY**

**Structure and organization of chromosomes and chromatin re-**

**modelingDNA replication:**

- DNA replication in prokaryotes and eukaryotes (including important differencesbetween the two).
- End replication problem: Telomere, telomerase and their role in health and disease.
- DNA repair mechanisms and their associated disorders.
- Inhibitors of DNA replication and their clinical significance.
- DNA recombination.
- DNA protein interaction.

**Transcription:**

- Structure of a gene - exons and introns, promoter, enhancers/repressors and response elements.

- Process of transcription in prokaryotes and eukaryotes.
- Post-transcriptional modifications.
- Inhibitors of transcription.
- RNA editing and stability.

**Genetic code, gene polymorphism, and mutation:**

- Characteristics of the genetic code.
- Molecular basis of the degeneracy of the genetic code (Wobble hypothesis).
- Mutation and gene polymorphism.
- Mutagens- examples of physical, chemical, and biological mutagens.
- Types of mutations.
- Mutation in health and disease.

**Translation:**

- Basic structure of prokaryotic and eukaryotic ribosomes.
- Process of protein synthesis (translation) in prokaryotes and eukaryotes.

- Post-translational modifications.
- Protein sorting, protein targeting, protein folding and related disorders.
- Inhibitors of translation in prokaryotes and eukaryotes, and their clinical significance.

### **Regulation of gene expression in prokaryotes and eukaryotes**

### **Recombinant DNA technology and its applications in modern**

### **medicine**

### **Overview of human genome project**

### **Basics of bioinformatics**

### **Principles of human genetics:**

- Alleles, genotypes and phenotypes.
- Patterns of inheritance: monogenic and polygenic inheritance.
- Population genetics.
- Genetic factors in causation of diseases.
- Types of genetic diseases: Chromosomal, monogenic and polygenic disorders,

mitochondrial disorders, nucleotide repeat expansion disorders, imprinting disorders.

- Screening for genetic diseases and prenatal testing.
- Ethical and legal issues related to medical genetics.

### **Stem cells and regenerative medicine:**

- Basic concepts regarding stem cells
- Types of stem cells: embryonic and induced pluripotent stem cells (IPSC)
- Application in regenerative medicine and disease therapeutics
- Ethical and legal issues related to use of stem cells in medicine.

## **MOLECULAR AND GENETIC ASPECTS OF CANCER**

- Biochemical characteristics of a cancer cell



- Biochemistry of carcinogenesis
- Carcinogens
- Role of oncogenes and tumor suppressor genes
- Genetic alterations and adaptations in cancer
- Tumor markers, cancer risk assessment, and community screening
- Biochemical basis of cancer chemotherapy and drug resistance
- Anti-cancer therapy.

## **IMMUNOLOGY**

- Organization and components of the immune system
- Innate and adaptive immunity- components and functions
- Antigens, immunogens, epitopes and haptens, carriers, adjuvants
- Immunoglobulin: structure, types, and functions
- Mechanism of antibody diversity: organization and expression of immunoglobulin genes, immunoglobulin gene rearrangement, class switching
- Humoral and cell-mediated immunity, regulation of immune responses, immuneresponse to infections
- Major histocompatibility complex, antigen processing, and presentation
- Antigen-antibody interaction, immune effector mechanisms
- Complement system
- Hypersensitivity reactions
- Tolerance, autoimmunity
- Immunodeficiency, immune unresponsiveness, and their clinical implications
- Vaccines
- Immunology of chronic diseases
- Transplantation immunology
- Immunodiagnostics and immunotherapy.

## **ENVIRONMENTAL BIOCHEMISTRY**

Health and pollution

Effects of environmental pollutants on the body

**Basic principles and practice of clinical biochemistry, Biochemical analytes, Assessment of organ system functions, and Recent advances in biochemistry**

## **BASIC PRINCIPLES AND PRACTICE OF CLINICAL BIOCHEMISTRY**

- Units of measurement, reagents, clinical laboratory supplies, basic separation techniques, laboratory calculations, specimen collection, transport and processing, safety in the laboratory
- Essentials of clinical investigations in Biochemistry, the clinical utility of laboratory tests (including accuracy, precision, sensitivity, specificity, ROC curves, etc), analysis in the laboratory, and selection and evaluation of methods (including statistical techniques)
- Evidence-based laboratory medicine, establishment and use of reference values, pre-analytical, analytical, and post-analytical variables and biological variations, total quality management (TQM), clinical laboratory and hospital informatics, concepts and reporting of critical values.

## **BIOCHEMICAL ANALYTES**

**Biochemical analyses and their clinical significance:**

- ☐ Amino acids, peptides and proteins; non-protein nitrogenous compounds
- ☐ Enzymes
- ☐ Carbohydrates
- ☐ Lipids, lipoproteins and apolipoproteins and other cardiovascular risk markers
- ☐ Electrolytes
- ☐ Blood gases and pH
- ☐ Hormones
- ☐ Catecholamines, serotonin, and other neurotransmitters
- ☐ Vitamins, minerals, trace and toxic elements
- ☐ Hemoglobin, and bilirubin
- ☐ Porphyrins
- ☐ Bone markers
- ☐ Tumour markers.

Body fluid analysis

Stone analysis

Therapeutic drug monitoring

Clinical toxicology

Pharmacogenomics

Pediatric and geriatric biochemical investigations

Biochemistry of aging

## **ASSESSMENT OF ORGAN SYSTEM FUNCTIONS**

### **Hematopoietic disorders:**

- ☐ Hemostasis and thrombosis-biochemical mechanism, related laboratory tests, antiplatelet therapy anticoagulant therapy, and fibrinolytic therapy
- ☐ Anemia- classification, etiology, laboratory investigations, and management
- ☐ Hemoglobinopathies - sickle cell anemia, methemoglobinemia, thalassemia syndromes
- ☐ RBC membrane, metabolism, inherited defects in RBC membrane, and enzymes
- ☐ ABO blood group system – the biochemical basis of incompatibility and transfusion biology
- ☐ Plasma cell disorders
- ☐ Other disorders of hematopoietic cells and their progenitors.

### **Endocrine system:**

- ☐ Classification and general mechanism of action of hormones
- ☐ Biosynthesis, secretion, regulation, transport, and mode of action of hypothalamic peptides, adenohypophyseal and neurohypophyseal hormones, thyroid and parathyroid hormones, calcitonin, pancreatic hormones, adrenocortical and medullary hormones, gonadal hormones, gastrointestinal hormones, opioid peptides, parahormones
- ☐ Neuro-modulators and their mechanism of action and physiological significance
- ☐ Biochemical aspects of diagnosis and treatment of endocrinal disorders
- ☐ Endocrinology of conception, reproduction, and contraception

- ☐ Antenatal testing, newborn screening, and inborn errors of metabolism.

**Cardiovascular system:**

- ☐ Atherosclerosis - pathogenesis, risk factors, prevention and treatment
- ☐ Biochemistry of cardiac failure, acute coronary syndrome, cardiomyopathies, and cardiac arrhythmias
- ☐ Cardiac biomarkers.

**Respiratory system:**

- ☐ Pulmonary gaseous exchanges in health and disease
- ☐ Biochemistry of respiratory disorders.

**Renal system:**

- ☐ Biochemistry of kidney functions
- ☐ Pathophysiology, biochemistry, laboratory findings and management in acute and chronic kidney diseases
- ☐ Nephrolithiasis, biochemical aspects of renal stones
- ☐ Biochemistry of renal transplant.

**Gastrointestinal system:**

- ☐ Biochemistry of gastric functions
- ☐ Regulatory peptides in the gut
- ☐ Digestion and absorption of nutrients, evaluation of malabsorption
- ☐ Biochemical aspects of- Peptic ulcer diseases, Zollinger-Ellison syndrome, Celiac disease, Inflammatory bowel disease, Protein losing enteropathy and Neuroendocrine tumors.

**Hepato-biliary and pancreatic system:**

- ☐ Biochemistry of hepato-biliary and pancreatic functions
- ☐ Formation, composition and functions of bile
- ☐ Pathophysiology, biochemistry, laboratory findings and management in acute and chronic hepato- biliary and pancreatic disorders.

**Skeletal system:**

- ☐ Bone structure, metabolism, associated disorders and markers
- ☐ Bone mineral homeostasis.

**Nervous system:**

- ☐ Neurotransmitters and their receptors
- ☐ Ion channels and channelopathies
- ☐ Neurotrophic factors
- ☐ Infective and inflammatory diseases of nervous system (meningitis, encephalitis etc.)
- ☐ Protein aggregation, neurodegeneration and related disorders (Alzheimer's disease, Parkinson's disease, Huntington's disease, and others)
- ☐ Prions and prion diseases
- ☐ Ischemic and hemorrhagic neuro disorders
- ☐ Neuro-immune disorders (Guillain-Barre syndrome, Myasthenia gravis, multiplesclerosis and others)
- ☐ Pathophysiology and biochemistry of psychiatric disorders
- ☐ ***Recent advances in Biochemistry.***

## TEACHING AND LEARNING METHODS

### General principles

Acquisition of competencies being the keystone of doctoral medical education, such training should be skill oriented. Learning in the program, essentially autonomous and self-directed, and emanating from academic and clinical work, shall also include assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real-time.

### Teaching-Learning methods

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested examples of teaching-learning methods are given below but are not limited to these. The frequency of various below-mentioned teaching-learning methods can vary based on the subject's requirements, competencies, workload, and overall working schedule in the concerned subject.**

- A. Lectures:** Didactic lectures should be used sparingly. A minimum of 10 lectures per year in the concerned PG department is suggested. Topics to be selected as per subject requirements.

All postgraduate trainees will be required to attend these lectures. Lectures can cover topics such as:

1. Subject related important topics as per specialty requirement
2. Recent advances
3. Research methodology and biostatistics
4. Salient features of Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3,4,5 can be done during research methodology/biostatistics and medical



education workshops in the institute.

**B. Journal club:** Minimum of once in 1-2 weeks is suggested.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

**C. Student Seminar:** Minimum of once every 1-2 weeks is suggested.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

**D. Student Symposium:** Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence- based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

**E. Laboratory work / Bedside clinics:** Minimum-once every 1-2 weeks.

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during laboratory work.

**F. Interdepartmental colloquium**

Faculty and students must attend monthly meetings between the main department and other department/s on topics of current/common interest or clinical cases.

**G. a. Rotational clinical / community / institutional postings**

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in-depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines.

Suggested departments and duration of rotational postings:

- General Medicine - 1 month (includes Endocrinology, Pediatrics, and ICU

posting)

- ✓ Endocrinology [Focus: Clinical correlation and important investigations related to diabetes mellitus and other diseases, dietary advice, point-of-care testing]
- ✓ ICU/CCU [Focus: ABG analysis and correlation, electrolyte imbalances, cardiac biomarkers and correlation, markers of septicemia and its management, basics of ventilation]
- ✓ Pediatrics [Focus: Inborn errors of metabolism and other common diseases, nutritional disorders, and dietary advice]
- Hematology - 15 days
- Immunohematology and blood transfusion (Transfusion Medicine)/Blood bank - 15 days
- Microbiology- 15 days
- Medical Education Unit (MEU) or Department of Medical Education (DOME)- one week/ shall attend a specific workshop or a training course [Focus: Principles of teaching-learning-assessment and other important aspects of Medical Education].

#### G. b. Posting under “District Residency Programme” (DRP):

- **Preamble:** Doctors have to be trained in diverse settings including those which are close to the community. Hence, they should be trained in the District Health System / the District Hospitals.

Provided that in respect of M.D./M.S. students admitted with effect from academic session 2021, the training imparted as part of the District Residency Programme, shall be considered as training imparted in a medical institution.

- **Objectives:** The main objectives of the District Residency Programme (DRP) would be:

To expose the post-graduate student to the District Health System/ District Hospital and involve them in health care services being provided by District Health System /District Hospital for learning while serving;

To acquaint them with the planning, implementation, monitoring, and assessment of outcomes of the National Health programmes at the district level.

To orient them to promotive, preventive, curative and rehabilitative services being provided by various categories of healthcare professionals under the umbrella of the National Health Mission.

In doing so, the post-graduate medical students would also be contributing towards strengthening of services of the District Health System as Speciality resident doctors working as members of the district teams.

- **Definition of District Hospital:** For the purpose of this programme, a District Hospital shall be a functional public sector/government-funded hospital of not less than 50 beds with facilities/staff for the designated specialties at that level/facility. Any post-graduate medical institution or a super-speciality hospital will not be considered as district hospital.
- **Definition of District Health System:** For the purpose of this programme, the District Health System shall include all public sector/government-funded hospitals and facilities (including community health centres, primary health centres, sub-health centres, urban health centres, etc.), as well as community outreach system in a district. This would also include district system engaged in running respective public health services including the implementation of national and state public health programmes.
- **District Residency Programme:** All post-graduate students pursuing M.D./M.S. in broad specialties in all medical colleges/institutions under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course curriculum. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduate programme. In the case of those students who have taken admission after completion of the Diploma in the relevant Speciality, the District Residency Programme shall take place in the third semester only. Similarly, the post-graduate diploma students shall undergo the District Residency Programme in the third semester. This rotation shall be termed as 'District Residency Programme' (DRP) and the post-graduate medical student undergoing training shall be termed as a 'District Resident'.
- **Training and Responsibilities of District Residents:** The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC). During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/sections/services at the District Health System/ District Hospital. The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Speciality and encompass night duties. Post-graduate students of specialties where direct patient care is not involved will be trained by District Health System/ District Hospital teams within the available avenues in coordination with the District Health Officer/Chief Medical Officer. They would be trained in and contribute to the diagnostic/laboratory services, pharmacy services, forensic services, general clinical duties, managerial roles, public health programmes etc., as applicable. They may also be posted in research units / facilities, laboratories and field sites of the Indian Council of Medical Research and other national research organizations.

- **Stipend and Leave for District Residents:** The District Residents shall continue to draw full stipend from their respective medical colleges for the duration of the rotation subject to the attendance record submitted by the appropriate district authorities to the parent medical college/institution, based on methods and system as prescribed. Subject to exigencies of work, the District Resident will be allowed one weekly holiday by rotation. They shall also be entitled to leave benefits as per the rules/guidelines of the parent college/university.

- **Training during DRP and Certification thereof:**

Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. Such monitoring systems shall also be accessible to the State/Union Territory Steering Committee and the National Coordination Cell.

The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.

Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective post-graduate course.

The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to be decided by the PGMEB to the concerned medical college and the Govt. of the State/UT.

## **H. Training in teaching skills**

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

## **I. Log book**

During the training period, the postgraduate student should maintain a logbook indicating the duration of the postings/work done in wards, OPDs, casualty, and other areas of the posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real-time. The logbook is thus a record

of various activities by the student like (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the logbook is to:

- a) Help maintain a record of the work done during training,
- b) Enable faculty/consultants to have direct information about the work done and intervene, if necessary,
- c) Provide feedback and assess the progress of learning with experience gained periodically.

The logbook should be used in the internal assessment of the student, and should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce a completed log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in the logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the NMC (Erstwhile MCI) Logbook Guidelines uploaded on the website.

A dynamic e-log book which needs to be updated on a weekly basis about the work being carried out by them and the training programme undergone during the period of training.

It shall be the duty of the post graduate guide imparting the training to assess and authenticate monthly the record (e-Log) books.

**J. Course in Research Methodology:**

All postgraduate students shall complete an online course in Research Methodology within one year of the commencement of the batch and generate the online certificate on successful completion of the course.

- No post-graduate student shall be permitted to appear in the examination without the above certification.

**K. Course in Ethics**

- All post-graduate students shall complete course in ethics including Good Laboratory Practices, whichever is relevant to them, to be conducted by institutions/Universities.
- The students are expected to complete the course in the first year.

- No post-graduate student shall be permitted to appear in the examination without the above certification.

#### **L. Course in Cardiac Life Support Skills**

- All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institution.
- The students are expected to complete the course in the first year.
- No post-graduate student shall be permitted to appear in the examination without the above certification.

#### **Other aspects**

- The postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The postgraduate trainees must undergo training in information technology and use of computers.
- Institutions may arrange training in any other courses like awareness in medical audit, medical law, exposure to human behaviour studies, finance, accounts, etc, which are beneficial to the postgraduate students.

**During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learned initially on the models, and later to be performed under supervision followed by independent performance. For this purpose, the provision of skills laboratories in medical colleges is mandatory.**

### **ASSESSMENT**

**The assessment for postgraduate student in Biochemistry will be of two types; Formative and Summative**

#### **FORMATIVE ASSESSMENT**

Formative assessment is the assessment conducted during the training with the primary purpose of providing feedback for improving learning. It should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning, and ability to practice in the system. The formative assessment will be used to determine the existing knowledge base and future needs, and identify priority areas.

#### **General Principles**



The Internal Assessment will include both theory and practical examination. At the end of first and second year, internal assessment I and II will be conducted respectively and at the end of third year before final examination, a preliminary internal assessment will be conducted which will be conducted like university examination. Internal assessment shall cover all domains of learning, and should be used to provide feedback to improve learning; it should also cover professionalism and communication skills.

**Formative assessment during the MD training should be based on:**

- Case presentation/case work up: once a week
  - The student will present a case from ward/lab along with investigations done in the clinical laboratory
- Laboratory performance: once a week
  - The student will analyze an unknown sample on an autoanalyzer, starting with calibration, quality control of the machine, and then loading the sample. He/she will do the reporting and interpret the results and will be evaluated the next day.
  - He/she will be evaluated separately for practicals listed in the undergraduate syllabus.
  - He/she will be evaluated at the end of each postgraduate practical session as listed under the psychomotor domain.
- Journal club: once a quarter
  - The student will present and critically evaluate an original research article. The article should be preferably from outside his/her area of work so that he/she can learn newer techniques. The focus should be on understanding the research question and evaluating whether appropriate study design, methodology, and statistical tools were used to find answers to the same.
- Seminar: once a fortnight
  - The student will present a topic from the syllabus and will try to research and include recent advances on that topic. He/she will also present recent advances (not included in the syllabus) periodically.
- Micro-teaching: Once a week
  - The teaching skills of the student will be evaluated. Special topics can be given, and the student will teach that topic to the evaluators or he/she may be evaluated during pre-practical briefing of undergraduate students.
- Interdepartmental case or seminar: once in 3 months
  - This should be organized at the institute level and appropriate vertical and horizontal integration should be ensured.

**Note: These sessions may be organized and recorded as an institutional activity for all postgraduates.**

- AETCOM : Once in every six months
  - The postgraduate student can be evaluated during the AETCOM sessions of the undergraduates.
  - Case scenarios should be provided and the postgraduate will be asked to demonstrate how he/she will respond to the situation.
- Attendance at Scientific meetings, CME programme (at least 02 each during the course)

**The student is to be assessed periodically as per categories listed in the appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).**

### **SUMMATIVE ASSESSMENT**

Assessment at the end of training to evaluate whether the student has acquired sufficient knowledge and skills to be awarded MD degree.

**Essential pre-requisites for appearing for examination include:**

**Eligibility Criteria for Post Graduate student for appearing in University Examination –**

1. Logbook of work done during the training period including rotational postings, departmental presentations, and reports of the internal assessment conducted during the training period should be submitted.
2. Candidates will be permitted to appear for examination only if attendance (Minimum 80% in each calendar year) and internal assessment are satisfactory and dissertation is accepted.
3. Have minimum one Poster Presentation or Podium presentation at a National/Zonal/State conference of his/her specialty
4. Have minimum one Research paper published in journal of his/her specialty as first author.
5. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
6. Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
7. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
8. Thesis acceptance by all evaluators before the conduct of University Examination.

The summative examination would be carried out as per the Rules given in the latest PGMER December 2023. The theory examination shall be held in advance before the

Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

The summative examination would be carried out as per the rules given in the latest Postgraduate Medical Education Regulations 2023. The theory examination shall be held in advance before the clinical and practical examination so that the answer books can be assessed and evaluated before the commencement of the clinical/practical and oral examination.

### **CRITERIA FOR EVALUATION OF M D Biochemistry**

<b>SL No</b>	<b>Description</b>	<b>MD Biochemistry</b>
<b>1</b>	<b>THEORY</b>	
	No of Theory Paper	4
	Marks for each Theory Paper	100
	Total marks for Theory Paper	400
	Passing Minimum for Theory	200/400 (40% minimum in each paper and aggregate of 50% in theory to declared pass in theory)
<b>2</b>	<b>PRACTICAL</b>	300
	• Dissertation	20 marks
	• OSPE	25 (5 stations x 5 marks)
	• Subject specific assessment	255
<b>3</b>	<b>VIVA VOCE</b>	100
	Passing minimum for Practical including Viva voce	200/400
	<p>The candidate shall secure not less than 50% marks in each head of passing which shall include</p> <p>(1) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)</p> <p>(2) Practical/Clinical and Viva voce - aggregate 50%</p> <p>(3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.</p> <p>(4) 5 per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. External examiner outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce.</p> <p>(5) No grace mark is permitted in post-graduate examination either for theory or for</p>	

	practical
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The postgraduate examination shall be in three parts.

### 1. Dissertation

Dissertation shall be submitted at least six months before the Theory and Clinical / Practical examination. A postgraduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis, by all evaluators before the conduct of university examination.

### 2. Theory examination:

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and certify post-graduate student's level of knowledge, skill, and competence at the end of the training, as given in the latest Postgraduate Medical Education Regulations 2023.

Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing the examination as a whole. The examination for M.D./ M.S shall be held at the end of the 3rd academic year.

**There shall be 4 theory papers each of three hours duration and each paper shall have TEN short essay questions of 10 marks (10x10=100).**

**Preferably case-based questions.**

Paper	Syllabus
Paper I	Biomolecules, Principles of Biophysics and its biomedical importance, Cell biology, Fluid, electrolyte and acid-base balance, Analytical techniques, and instrumentation, Biostatistics and research methodology, Basics of medical education in teaching and assessment of Biochemistry.
Paper II	Enzymes, Bioenergetics, Biological oxidation, Intermediary metabolism and inborn errors of metabolism, Nutrition, Vitamins and Minerals, Detoxification and metabolism of xenobiotics, Free radicals, and anti-oxidant defense systems
Paper III	Molecular biology, Molecular and genetic aspects of cancer, Immunology, and Environmental Biochemistry
Paper IV	Basic principles and practice of clinical biochemistry, Biochemical analytes, Assessment of organ system functions, and Recent advances in biochemistry

**Questions on recent advances may be asked in any or all papers.**

**Note: The distribution of chapters / topics shown on the papers are suggestive only and may overlap or change.**

### 3. Practical and oral/viva voce examination:

#### Practical examination: 300 marks

The practical examination should be spread over **two** days and include various major components of the syllabus focusing mainly on the psychomotor domain. One day should be for conducting practical examination including table viva that will focus on the nuances of laboratory techniques and quality assurance.

**Oral/Viva voce examination** on defined areas should be conducted by each examiner **separately**. Oral examination shall be comprehensive enough to test the postgraduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

#### The practical examination should include(300 marks):

- Dissertation presentation: 20 marks  
The postgraduate student will present his dissertation to all the four examiners. Which will be evaluate by a pedagogy by all the four examiners. The ability of the student to justify the methodology, and findings with interpretation, should be evaluated.
- One Clinical / Paper case: 75 marks  
A sample of case assigned will be analyzed by the student, and he/she will have to prepare the report along with the interpretation of the same. It should include both serum and urine analysis.
- One practical exercise on any molecular biology technique.50 marks
- One practical exercise on immunology technique. 50 marks
- OSPE: 25 marks  
It shall include 5 questions of 5 marks each. It shall be conducted on various topics which have not been covered in the above-mentioned practical, there will be skill and interpretation stations kept for OSPE and should include, if possible, evaluation of AETCOM (Attitude, Ethics, and Communication) skills of the students.
- Evaluation of laboratory management skills. 50 marks
- **Pedagogy Exercise: 30 marks (20 minutes duration plus 10 minutes for questions)**  
**Micro-teaching: The essentials of classroom teaching skills should be evaluated. A topic would be given to each candidate along with the practical examination question paper on the first day. Student is asked to make a presentation on the topic on the second day for 20 minutes**

#### Viva-voce Examination 100 Marks:

##### Grand Viva Voce: 100 marks

Viva voce on defined areas should be conducted by each examiner separately. The oral examination shall be comprehensive enough to test the postgraduate student's overall knowledge

of the subject focusing on the and affective domains

# **VI. RECOMMENDED BOOKS (LATEST EDITIONS):**

<b>Sl.No</b>	<b>Name of the Textbook</b>	<b>Authors</b>	<b>Publishers</b>
1.	Harrison's principles of internal medicine	Fauci, braunwald,kaper,haurer, longo, jameson,lascalgo	Mc Graw hill Companies
2.	Oxford Textbook of medicine	David A Warrell, Timothy Cox, John Firth	Oxford university press
3.	Harper's Review of Biochemistry	Murray.K.	Appleton & Lange
4.	Lehniger's Principles's of Biochemistry.	David L Nelson	CBS
5.	Biochemistry	Lubert Stryer	WH Freeman
6.	Text Book of Biochemistry with clinical correlations	Devlin TM	Wiley Liss
7.	Biochemistry	Voet D & Voet J	John Wiley & Sons
8.	Biochemistry A Functional approach	McGilvery RW	WB Saunders
9.	Medical Biochemistry	N V Bhagawan	Jones & Bartlett
10.	Biochemistry A case oriented Approach	Montgomery	C V Mosby
11.	Duncan's Diseases of Metabolism	Bondy	Academic press
12.	Molecular cell Biology	Harvey Lodish	W.H.Freeman & Company
13.	Clinical Biochemistry.	Latner	WB Saunders
14.	Practical Clinical Biochemistry	Varley	Heinemann Medical Books
15.	Teitz Text Book of Clinical Biochemistry	Burtis	WB Saunders
16.	Clinical Chemistry, Theory, Analysis & Correlation.	Kaplan	Academic Press
17.	Clinical Chemistry	Marshall	Churchill Livingstone
18.	Molecular Biology of THE CELL.	Bruce Alberts	Garland Science, New York
19.	Text Book of Biochemistry	West & Todd	Oxford & IBH
20.	Metabolic basis of inherited diseases.	Stab Bury	Churchill Livingstone
21.	Biochemistry.	APPS	WB Saunders
22.	Principles of Biochemistry.	Abrham White	Mac Graw Hill Inc.
23.	Clinical Chemistry	Henry	Churchill Livingstone

24.	Krauses Food, Nutrition & Diet Therapy.	L. Kathleen Mahan	WB Saunders
25.	Clinical Physiology of acid-base and electrolyte disorders.	Rose BD	McGraw Hill
26.	Clinical chemistry. Principles, Procedures & Correlations	M. L. Bishop	Lippincott
27.	The Principles & Practice of Diagnostic Enzymology	Henry Wilkinson	Arnold Publishers Ltd
28.	Text Book of Immunology. An Introduction to immunochemistry & immunobiology.	James T. Barrett	C.V.Mosby. Company

#### VII. RECOMMENDED JOURNALS:

Sl.No	Name of the Journal
1	Annual Review of Biochemistry.
2	Clinical Chemistry (J).
3	Trends in Biochemical Sciences.
4	Clinical Chemistry Reviews.
5	Medical Biochemistry (J).
6	Recent Advances in Endocrinology and Metabolism.
7	Recent Advances in Clinical Chemistry.
8	Essays in Biochemistry, Biochemical Society, UK.
9	Indian Journal of Clinical Biochemistry (J).
10	Indian Journal of Medical Research (J).



### ANNEXURE 1

Student appraisal form for MD in Biochemistry											
	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic aptitude and learning</b>										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
<b>2</b>	<b>Work related to training</b>										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of										

	training										
<b>3</b>	<b>Professional attributes</b>										
3.1	Responsibility and Accountability										
3.2	Contribution to growth of learning of the Team										
3.3	Conduct that is ethically appropriate and respectful at all times										
<b>4</b>	<b>Space for additional comments</b>										
<b>5</b>	<b>Disposition</b>										
	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain.										
	Name and Signature of the assesse										
	Name and Signature of the assessor										
	Date										

## GUIDELINES FOR COMPETENCY BASED POST GRADUATE TRAINING PROGRAMME FOR MD IN PATHOLOGY

### **Preamble**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. This programme is meant to standardize Pathology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in teaching and resultantly creating suitable manpower with appropriate expertise. The post graduate student should be trained in handling and processing histopathology, clinical pathology, microbiology, biochemistry and transfusion medicine samples with a knowledge of general principles and methodology.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board cum Expert group of NMC has attempted to render uniformity without compromise to the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### **Goal**

The goal of postgraduate medical education shall be to produce a competent pathologist, diagnostician, research fellow and / or a medical teacher.

### **PATHOLOGY SPECIFIC LEARNING OBJECTIVES:**

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the subheadings.

#### **A. Knowledge**

1. Acquire competencies relevant to all aspects of pathology such as to diagnose hematology, cytopathology, histopathology, bone marrow, blood transfusion, clinical pathology specimens and other laboratory tests and interpret these including clinical biochemistry.

2. Interpret clinical and laboratory data with reasonable accuracy to prepare a compendious report as per universal reporting protocol including synoptic reporting, and to advise newer molecular tests in problematic cases.
3. Correlate clinical and laboratory findings with pathology findings at autopsy, identify miscorrelations and the causes of death due to diseases.
4. Maintain quality control of all tests by being part of Internal Quality Control Monitoring program, to make and record observations systematically and maintain accurate records of tests and their results for reasonable periods of time, identify problems in the laboratory, offer solutions thereof and maintain a high order of quality control.
5. Have knowledge of safe and effective disposal of laboratory waste, to manage and ensure minimal risk of exposure to infections and accidents to laboratory personnel.

## **B. Skill**

1. Able to collect specimens by routinely performing non-invasive out-patient procedures such as venepuncture, finger-prick, fine needle aspiration of superficial lumps and bone-marrow aspirates, and provide appropriate help to colleagues performing an invasive procedure such as a biopsy or an imaging guided biopsy.
2. Able to perform routine tests in a Pathology Laboratory including autopsy and museum techniques, grossing of specimens, processing, cutting of paraffin and frozen sections, making smears and staining, and should be familiar with the function, handling and routine care of equipments in the laboratory.

## **C. Teaching**

The student should be able to effectively teach and assess undergraduate medical students (MBBS) and allied health science courses (Dentistry, Nursing, Physiotherapy, Medical Laboratory technology) including laboratory personnel, so that they become competent healthcare professionals.

## **D. Research**

**Post graduate student should acquire skills to be able to plan, execute, analyse, present and publish research work independently or as a part of team and become a more experienced teacher & mentor in all the above areas and to eventually be able to guide postgraduates in their thesis, research work and all other academic activities.**

**E. Professionalism, Ethics and Communication skills** The student should be able to learn and apply principles of professionalism, ethics and effective communication in conduct of research, pathology-based services, educational activities and day to day work

## **Pathology Specific Competencies:**

### **A. Cognitive domain**

**A post graduate student upon successfully qualifying in the MD (Pathology) examination should have acquired the following broad theoretical competencies and should be:**

1. Capable of offering a high quality diagnostic opinion in a given clinical situation with an appropriate and relevant sample of tissue, blood, body fluid, etc. for the purpose of diagnosis and overall wellbeing of the ill.
2. Conversant with the standard operating procedures of various laboratories including histopathology, cytopathology, hematology and laboratory medicine
3. Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
4. Capable of pursuing clinical and laboratory based research. He/she should be introduced to basic research methodology so that he/she can conduct fundamental and applied research.

## **B. Affective domain**

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.
4. The student should demonstrate a commitment to ethical principles relating to research conduct and research publication.

## **C. Psychomotor domain**

1. Able to perform grossing of biopsy and surgical specimens including gross diagnosis and taking appropriate sections/ samples necessary for diagnosis, comprehensive staging, and ancillary testing.
2. Conversant in histopathology tissue processing techniques and troubleshooting, cutting of paraffin and frozen sections, making imprint smears, and staining, and immunohistochemistry.
3. Able to collect specimens by routinely performing non-invasive out-patient procedures such as venipuncture, finger-prick, fine needle aspiration of superficial lumps and bone-marrow aspirates, making smears and staining, and provide appropriate guidance to colleagues performing procedure such as a biopsy or an imaging guided biopsy including on-site microscopic assessment of specimen adequacy.
4. Perform an autopsy, dissect various organ complexes and display the gross findings.
5. Conversant with the function, handling, and routine care of equipment in the laboratory and quality assurance.
6. Able to teach and share his knowledge and competence with others. The student should be imparted training in teaching methods in the subject which may enable the student to take up teaching assignments in Medical Colleges/Institutes.
7. Able to pursue clinical and laboratory-based research. He/she should be introduced to basic research methodology so that he/she can independently conduct fundamental and applied research.

## **Syllabus**

### **Course content:**

It is difficult to give a precise outline of the Course Contents for post graduate training. A postgraduate is supposed to acquire not only the professional competence of a well-trained specialist but also academic maturity, a capacity to reason and critically analyse scientific data

as well as to keep himself abreast of the latest developments in the field of Pathology and related sciences. The study of Anatomic Pathology includes all aspects of Pathology as encompassed in the branches of General and Systemic Pathology. Only the broad outlines are provided.

## **A. COGNITIVE DOMAIN**

### **A) General Pathology:**

#### **Normal cell and tissue structure and function:**

- The changes in cellular structure and function in diseases.
- Causes of disease, its pathogenesis, reaction of cells, tissues, organ systems, and the body to various sub lethal and lethal injuries.
- Cellular adaptation, cell injury, and cell death.
- Mechanism, morphology and examples of cell injury, necrosis, apoptosis, autophagy, and newer forms of cell death including necroptosis and pyroptosis.
- Sub cellular and cellular responses and adaptation to injury.
- Intracellular and intercellular accumulations, pathological calcification, and cell aging.

#### **Acute and chronic inflammation:**

- Vascular and cellular events in acute inflammation, chemical mediators, outcome, and morphological patterns of acute inflammation.
- Chronic inflammation with special reference to granulomatous inflammation.
- Systemic effects and effects of deranged inflammation.
- Tissue renewal and repair: Regeneration healing and fibrosis.
- Control of normal cell proliferation and tissue growth, mechanism of tissue regeneration, repair by healing and fibrosis.
- Extracellular matrix and cell matrix interactions.

#### **Hemodynamic disorders, thromboembolic disease, and shock:**



- Edema, hyperemia, congestion, and hemorrhage.
- Normal Hemostasis, thrombosis, DIC, embolism, infarction, and shock.

### **Genetic Disorders**

- Principles of genetics, normal karyotyping.
- Mutations, Mendelian disorders, disorders with multifactorial inheritance cytogenetic disorders involving autosomes and sex chromosomes.
- Single gene disorders with nonclassic inheritance.
- Diagnosis of genetic disorders involving molecular and genetic techniques.

### **Neoplasia**

- Definition, nomenclature, and biology of tumor growth
- Molecular basis of cancer with special reference to carcinogenic agents and molecular basis of multistep carcinogenesis.
- Epidemiology and clinical features of tumors.
- Grading, staging and laboratory diagnosis of cancer.

### **Infectious Diseases**

- Pathology and general principles of microbial pathogenesis, special techniques for diagnosing bacterial, fungal, parasitic, and viral infections.

### **Environmental and nutritional pathology**

- Common environmental and occupational exposures leading on to diseases.
- Nutritional deficiencies and obesity related disorders.

### **Disease of Infancy and Childhood**

- Congenital anomalies, birth injuries, diseases of neonates, inborn errors of metabolism, tumor, and tumor like lesions of infancy and childhood.

### **Immunopathology**

- Innate immunity- Role of phagocytic cells, complement, mast cells & humoral mechanisms.
- Specific Acquired Immunity- Details about antibody production & action, Brief principles about memory, Ag specificity & vaccination.
- Cell involved in Immune response- T- Lymphocytes, B-lymphocytes, macrophages, dendritic cells, and natural-killer cells.
- Cytokines with details about their properties and functions.
- Structure and function of histocompatibility molecules and disease association.
- Disorders of the immune system.
- All hypersensitivity reactions.
- Autoimmune disorders with special reference to SLE, Rheumatoid arthritis, Sjogren's syndrome, systemic sclerosis, polyarteritis nodosa and other vasculitides, Mixed

connective tissue disorders and inflammatory disorders.

- Immunodeficiency syndrome – Acquired with emphasis on AIDS.
- Amyloidosis including pathogenesis, special stains & clinical correlation.
- Transplant rejection in detail.
- Graft vs Host Disease.

### **B) Systemic Pathology:**

The study of normal structure and function of various organ systems and the etiopathogenesis,

gross and microscopic alterations of structure of these organ systems in disease and functional

correlation with clinical features.

#### **Blood vessels, lymphatic and veins**

- Normal morphology, congenital anomalies, atherosclerosis, hypertensive vascular disease.
- Inflammatory and neoplastic diseases of all the vessels.

#### **Heart**

- Normal morphology, its blood supply and effect of aging on heart.
- Ischemic, Hypertensive, valvular, congenital heart diseases.
- Cardiomyopathies
- Myocardial disorders
- Pericardial diseases.
- Tumors of the heart.

#### **Lungs and Mediastinum**

- Congenital anomalies
- Obstructive and restrictive pulmonary diseases
- Diseases of vascular origin
- Infections of Lung
- Infections of Mediastinum
- Tumors of lung
- Lung transplantation
- Diseases of pleura
- Thymus – Developmental, autoimmune, and inflammatory disorder and tumors.

**Head and Neck**

- Oral cavity: - inflammatory disease, Preneoplastic lesions and tumors.
- Diseases of teeth and supporting structures.
- Upper airways and ear – congenital anomalies, infections, and tumors.
- Salivary glands – Infections autoimmune disorders and tumors.

**Gastrointestinal Tract**

- Congenital anomalies, infections, inflammatory and vascular disorders and tumors of esophagus, stomach, small and large intestines, appendix, and anal canal.
- Diseases of the peritoneum, Omentum and Mesentery Retroperitoneum.
- Inflammatory and neoplastic lesions.

**Liver**

- Normal morphology with general features of hepatic disease including LFTs.
- Infectious, autoimmune drug induced metabolic and circulatory disorders of liver.
- Hepatic diseases associated with pregnancy, neonates, organ and bone marrow transplantation.
- Liver transplantation pathology.
- Cysts, Nodules, and tumors of liver.

**Biliary tract**

- Congenital anomalies, injuries, Infection, inflammation, of Gallstones and tumors of gall bladder and extra hepatic bile ducts. Pancreas.
- Congenital anomalies, pancreatitis, and neoplasms of pancreas.

**Kidney**

- Clinical manifestations of renal diseases
- Congenital anomalies
- Diseases affecting glomeruli, tubules, interstitium and blood vessels.
- Cystic diseases of kidney
- Nephrolithiasis
- Tumors of kidney
- Kidney Transplant pathology

**Lower urinary tract and male genital system**

- Congenital anomalies, inflammation and tumors of bladder, ureter, urethra, penis, testis, epididymis, and Scrotum.
- Inflammation, enlargement, and tumors of prostate.

**Female genital tract**

- Physiology, cytology and histology of female genital tract, menstrual disorders, and hormonal abnormalities.
- Congenital anomalies, inflammation, preneoplastic and neoplastic lesions of vulva, vagina, cervix, uterus, fallopian tubes, ovaries and mesonephron.
- Gestational and placental disorders.

**Breast**

- Inflammations, benign epithelial lesions, and tumors of the breast.
- Diseases of male breast.

**Endocrine System**

- Normal hormonal levels and functions of all the endocrine glands.
- Hypo and hyperactivity of glands of endocrine system i.e., pituitary, thyroid, parathyroid, pancreas, adrenals, and pineal gland.
- Autoimmune diseases, inflammations and tumors affecting these glands,
- Neuroendocrine tumors,

**Skin and Subcutaneous tissue**

- Disorders of pigmentation and melanocytes,
- Inflammatory, vesiculobullous, and infectious disease,
- Proliferative lesions and Tumors of the epidermis, dermis, and skin appendage.

**Musculoskeletal system**

- Bone Modelling, growth, and development, genetic and acquired abnormalities in bone cells, matrix and structure, fractures, necrosis and infections of bones, tumors and tumorlike lesions,
- Joints: Arthritis, tumor, and tumor-like lesions.
- Soft tissue: Tumors and tumor-like lesions.

**Peripheral nerves and skeletal muscles**

- General reactions of motor units.
- Inflammatory, infectious, hereditary, metabolic, and traumatic neuropathies.
- Atrophy, dystrophy, myopathies of the skeletal muscles.
- Diseases of neuromuscular junction.
- Tumors of peripheral nerves and skeletal muscles.

**Skull and Central Nervous System**

- Degenerative, metabolic, toxic, demyelinating, infectious, cerebrovascular malformations, and traumatic injuries.

- Tumors.

### **Eye and Orbit**

- Infections, inflammatory, congenital diseases and neoplasms of orbit, eyelid, conjunctiva  
sclera, uvea, cornea, retina, and optic nerves.

### **C) Hematology and Transfusion medicine**

The study of Hematology includes all aspects of the diseases of the blood and bone marrow.

This would involve the study of the normal, and the causes of diseases and the changes thereof.

#### **Biology of stem cell and Hematopoiesis**

- Overview of stem cell biology and cellular biology of hematopoiesis.
- Transcription factors and humoral regulation in normal and malignant hematopoiesis.
- Interaction between hematopoietic stem cells, progenitor cell and stromal compartment of  
bone marrow.
- Stem cell homing & mobilization.

#### **Erythroid maturation, differentiation, and abnormality**

- Pathobiology of human erythrocyte & Hemoglobin Anemia.
- Approach to anemia in adults and children in: Clinical correlation & diagnostic modalities.
- Classification of anemias (Morphological, pathophysiological, and based on erythropoiesis  
i.e., proliferative vs non-proliferative).
- Iron deficiency anemia including iron metabolism and differential diagnosis from other microcytic hypochromic anemias.
- Disorder of iron metabolism including iron overload.
- Anemia of chronic disorders with special reference to infections, collagen vascular disorders, inflammation etc.
- Megaloblastic anemia and other causes of megaloblastosis.
- Definition, approach, and classification of hemolytic anemia.
- Lab diagnosis of Hemoglobin disorders and hereditary anemia like Thalassemia and related  
hemoglobinopathies, sickle cell anemia.
- Hemoglobin associated with altered Oxygen affinity.

- Red blood cell enzymopathy, membrane disorder, autoimmune hemolytic anemia, nonimmune hemolytic anemia, paroxysmal nocturnal hemoglobinuria.
- Approach to Pancytopenia/ Cytopenia.
- Bone marrow failure syndrome.
- Porphyria.

### **WBC disorders, complement and immunoglobulin biology**

- Normal granulopoiesis.
- Acquired and congenital disorders of phagocytosis (neutrophil, monocyte, eosinophil, and macrophages).
- Disorder of leukocyte number, function, and morphology.

### **Storage disorder**

### **Hematological responses to Infections**

- Viral disorders - Infectious mononucleosis, Hepatitis, and dengue.
- Parasitic infections - Malaria, Kala azar.

### **Hematological malignancies**

- Conventional & molecular cytogenetic and immunohistochemical basis of hematological malignancies.
- Classification (WHO, ICC).
- Their basis and diagnostic approach to various hematological malignancies.
- Pathophysiology, prognostic factors, cytochemistry, cytogenetics of various leukemias.
- Pathophysiology and classification of MDS, MPN/MDS, myeloproliferative disorders.
- Pathophysiology of Non-Hodgkin's lymphoma, Clinical staging of Hodgkin's lymphoma.
- Role of molecular cytogenetics and immunohistochemistry in Hodgkin's and NonHodgkin's lymphoma and lymphoproliferative disorders.
- AIDS related and Transplant related lymphomas.
- Plasma cell dyscrasias and gammopathies.
- Mastocytosis.
- Role of chemotherapy and antineoplastic agents based on molecular mechanism of hematological malignancies, clinical use of hematopoietic growth factors.

### **Hematopoietic stem cell transplantation**

- Role and indications of HST, immunodeficiency state, hematological Malignancies and Non-hematological disorders.

- Practical aspect of umbilical cord stem cells transplantation.
- Peripheral stem cell collection.
- Role of stem cell in tissue repair.
- Complications of Hematopoietic stem cell transplant.
- Gene therapy and genetic engineering.

### **Prenatal diagnosis of genetic hematological diseases**

#### **Hemostasis & Thrombosis**

- Megakaryocyte and platelet structure.
- Molecular basis of platelet function, activation.
- Role of blood vessel, coagulation system and fibrinolytic system in hemostasis.
- Clinical and lab evaluation of bleeding and coagulation disorders.
- Clinical & diagnostic aspects of factor deficiencies including hemophilia, von Willebrand disease, DIC, Vitamin K deficiency.
- Thrombotic and non-thrombotic purpura.
- Hereditary and acquired platelet disorders and its management.
- Thrombophilia (Inherited & acquired).
- Lab evaluation and management of hypercoagulable states.

#### **Human blood group antigen and antibody and Immuno-hematology**

- Selection of donor and screening..
- Principle, indication and storage of red blood cells, WBC, platelet, and plasma transfusion.
- Various methods of component separation and plasma derivatives with special reference to Fresh frozen plasma, cryo-precipitates, platelet concentrate, single donor plasma, albumin, and Immunoglobulin.
- Graft Rejection, GVH diseases, Transfusion Reactions, Blood grouping & cross matching.
- Blood bank audit.
- Apheresis

#### **Hematological manifestations of systemic diseases**

- Liver disorders, renal disorders, infections, cancers, parasitic diseases, AIDS, pregnancy, and surgical patients.



## **Spleen and its disorders**

### **D) Laboratory Medicine (Clinical Pathology including Parasitology)**

- Principles of testing, indications, values with ranges in normal and diseased states in relation to:

- o Liver function tests
- o Renal function tests
- o Endocrine function tests
- o Body fluid analysis including stool, urine, semen, CSF, etc.

- Principles of laboratory automation, trouble shooting, and quality assurance.

### **D)Special techniques**

The student is expected to acquire a general acquaintance of techniques and principles and to

interpret data in the following fields:

- Immunopathology,
- Electron microscopy,
- Histochemistry,
- Immunohistochemistry,
- Cytogenetics and in-situ hybridization,
- Molecular Biology,
- Digital Pathology and image analysis,
- Maintenance of records,
- Information retrieval, use of Computer and Internet in medicine.

### **E) Instrumentation and automation**

- Principles, indications, working, maintenance, and troubleshooting of equipment used in

various laboratories:

- o Histopathology laboratory – Histopathology tissue processor, microtome, water bath, embedding station, Stainer, IHC Stainer, ultramicrotome, etc.
- o Microscopes – Immunofluorescence, FISH, Confocal, Electron, etc.
- o Cytopathology Laboratory – Centrifuge, Cytocentrifuge, Cytospin apparatus, liquid-based cytology, etc.
- o Hematology Laboratory – automated cell counter, flow cytometer, coagulometer, HPLC, Electrophoresis apparatus, immunoblot, etc.
- o Clinical Pathology –Photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, chemiluminescence, etc.
- o Digital pathology – Whole slide scanners

o Molecular pathology – PCR, Sanger sequencer, NGS sequencers, etc.

- Automation in Pathology.

- Good lab practices and safety, record maintenance of capital equipment and consumables,

purchase specifications, approximate costs of reagents and equipment, maintenance of store

logbooks, etc.

#### **F) Quality assurance program**

- Internal and external quality assurance methods.

- Intra assay variations, batch variations, validation of chemicals and instruments.

#### **G) Establishment Act and Rules and regulations formed by Govt. or regulatory bodies**

#### **H) Biomedical Waste management**

- Disposal methods for each specimen, reagents, instruments, autoclaving techniques, recycling of products and e-waste.

#### **I) Biostatistics, Research Methodology and Clinical Epidemiology**

#### **J) Ethics and Medico legal aspects relevant to Pathology**

#### **K) Current topics and recent advances in pathology**

### **B. PSYCHOMOTOR DOMAIN**

<b>At the end of the course, the student should have acquired skills and be able to demonstrate following predominant Psychomotor domain competencies</b>		
<b>Sr. No.</b>	<b>Competency</b>	<b>Perform under supervision/ perform independently/ Observation only</b>
<b>I.</b>	<b>HISTOPATHOLOGY (SURGICAL PATHOLOGY)</b>	
1.	Given the clinical and operative data, identify and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly diagnose common lesions received on an average day from the surgical service of an average teaching hospital	Independently

2.	Perform a systematic gross examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies and nerve biopsies, demonstrate the orientation of tissues in paraffin blocks.	Independently
3.	Identify and systematically and accurately describe the chief histo- morphological alterations in the tissue received in the surgical pathology service. He/she should also correctly interpret and correlate with the clinical data to diagnose routine surgical material received on an average day.	Independently
4.	Identify common problems in histopathology processing techniques (poor fixation, delayed fixation, poor staining, etc.,) including automated tissue processing machine troubleshooting and rectify common problems	Independently
5.	Operate and maintain common equipment in the histopathology laboratory such as microtome, water bath, cryostat, tissue processor, auto Stainer, etc.	Perform under supervision
6.	Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome	Perform under supervision
7.	Stain paraffin sections with hematoxylin and eosin stain and common special stains needed for diagnosis (Stains for collagen, elastic fibres and reticulin, Iron stain, PAS stain, Acid fast stains, Any other stains needed for diagnosis)	Independently
8.	Cut a frozen section, stain and interpret the slide in correlation with the clinical data provided	Independently
9.	Standardize and validate new antibodies for immunohistochemistry with understanding of controls, clones, and dilutions	Independently
10.	Perform immunohistochemistry on paraffin sections using manual method	Independently

11.	Identify common problems in immunohistochemistry procedure(artifacts, inadequate retrieval, section floating, IHC failure, etc.,) and rectify such problems	Independently
12.	Decide on the appropriate immunohistochemical panels for diagnosis,prognosis and predictive purposes in common disease conditions based on standard recommendations and interpret their results	Independently
13.	Write histopathology reports, including synoptic reports, wherever needed, following protocols and international standards. The reports should be succinct and lucid, with clinical notes and advice, as necessary.	Independently
II	CYTOPATHOLOGY	
1.	Perform fine needle aspiration of superficial lumps and make goodquality smears including collection of material for cell block preparation and decide on the type of fixative and stain in a given case	Independently
2.	Prepare and stain good quality smears for cytopathological Examination	Independently
3.	Provide appropriate guidance to colleagues performing procedure such as a biopsy or an imaging guided biopsy including on-site microscopicassessment of specimen adequacy.	Independently
4.	Decide on the technique of collection, preservation, transport and concentration of various exfoliative cytology specimens (such asfilters, centrifuge, liquid-based cytology, cytospin, etc.)	Independently
5.	Perform on-site adequacy assessment in image guided sampling procedures and decide on sample triage for routine diagnosis (type of preparation, stain, etc.) and ancillary tests including microbiological and molecular tests	Independently
6.	Diagnose common cases received in a routine cytopathology laboratory and categorize them into negative, inconclusive andpositive, using the correct technique of screening	Independently

	and dotting the slides	
	for suspicious cells, correctly identify the type of tumor, if present, and the presence of organisms, fungi and parasites, if present	
7.	Perform preparations (cytospin smears, liquid-based cytology, cellblocks, etc.) of common cytological samples using equipment such as centrifuge, cytocentrifuge and liquid based cytology apparatus	Observation only
III	HEMATOLOGY	
1.	Perform venipuncture for peripheral blood collection and decide on appropriate collection tubes, storage, and anticoagulant based on indication	Independently
2.	Prepare good quality peripheral blood smears, stain and report peripheral blood counts and other findings including reticulocyte and platelet counts on cell counter and manually, identify commonly occurring hemoparasites	Independently
3.	Perform bone marrow aspirates and biopsy, prepare good quality smears and imprints	Perform under supervision
4.	Perform bone marrow aspirate staining including stain for iron	Independently
5.	Perform cytochemical characterization of leukemia with special stains on bone marrow aspirates	Perform under supervision
6.	Perform and interpret coagulation profile including PT, APTT and FDP	Independently
7.	Perform and interpret sickling test and osmotic fragility test	Independently
8.	Describe accurately the morphologic findings in the peripheral and bone marrow smears, identifying and quantitating the morphologic abnormalities in disease states and arriving at a correct diagnosis in at least common cases referred to the Hematology clinic, given the relevant clinical data	Independently

9.	<p>Given the clinical data, interpret the results of</p> <ul style="list-style-type: none"> <li>i. Red cell indices</li> <li>ii. Plasma hemoglobin</li> <li>iii. Hemosiderin in urine</li> <li>iv. Hemolytic anemia profile including HPLC, Hb electrophoresis etc.</li> <li>v. Hemoglobin and serum protein electrophoresis</li> <li>vi. Clotting time and other point of care tests for bleeding</li> </ul>	Independently
	<ul style="list-style-type: none"> <li>vii. G6PD enzyme estimation</li> <li>viii. Platelet function tests including platelet aggregation and adhesion and PF3 release</li> <li>ix. Russell's viper venom time (RVVT)</li> <li>x. Coagulation Factor assays</li> <li>xi. Serum Fibrinogen</li> <li>xii. Screening for coagulation factor inhibitor, Bethesda Assay,</li> <li>xiii. Fibrin Degradation Products (FDP), D-Dimers</li> <li>xiv. Monitoring of anti-coagulant therapy</li> <li>xv. Thrombophilia profile (Lupus anticoagulant (LAC), Anticardiolipin Antibody (ACA), Activated Protein C Resistance (APCR), Protein C (Pr C), Protein S (Pr S) and Antithrombin III (AT III))</li> <li>xvi. Serum ferritin, Serum iron and total iron binding capacity</li> </ul>	
10.	Interpret flow cytometry findings in the immunophenotyping of leukemia, CD34 enumeration, CD 3/CD 19 enumeration, PNH workup, etc.	Independently
11.	Interpret results of cytogenetics and molecular diagnostics in the work up of hematological diseases	Independently

12.	Prepare samples as appropriate for the indication, and operate equipment such as automated cell counter, flow cytometry, coagulometers, HPLC and electrophoresis apparatus	Observation only
IV	LABORATORY MEDICINE	
1.	Plan a strategy of laboratory investigation of a given case, given the relevant clinical history and physical findings in a logical sequence, with a rational explanation of each step; be able to correctly interpret the laboratory data of such studies, and discuss their significance with a view to arrive at a diagnosis.	Independently
2.	Perform urine analysis including physical, chemical and microscopic, examination of the sediment as well as by Dipstick methods.	Independently
3.	Perform macroscopic and microscopic examination of feces and identify the ova and cysts of common parasites.	Independently

4.	Perform a complete examination: physical, chemical and cell content of Cerebrospinal Fluid (C.S.F), pleural and peritoneal fluid	Independently
5.	Perform semen analysis and interpret results in the context of clinical and hormone findings	Independently
6.	Perform quantitative estimation of blood/serum by automated techniques for common biochemical tests such as blood urea, blood sugar, serum protein, serum bilirubins etc.	Independently
7.	Prepare standard solutions and reagents relevant to common biochemical tests including the preparation of normal solution, molar solution and buffers	Independently
8.	Interpret and report common laboratory biochemical tests (LFT, KFT, endocrine function tests) with understanding of clinical implications	Independently



9.	Explain principles of instrumentation, use and application of instruments, operate, maintain and troubleshoot common equipment used such as photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, PCR, chemiluminescence, etc.	Perform under supervision
V	TRANSFUSION MEDICINE	
1.	Perform selection and bleeding of donors, ABO and Rh grouping and cross match, antibody screening and titer, selection of blood forexchange transfusion	Independently
2.	Resolve ABO grouping problems and outline measures for investigation of transfusion medicine	Independently
3.	Perform and interpret anti-globulin test in antenatal and neonatal work Up	Independently
4.	Prepare blood components such as cryoprecipitates, platelet concentrates, fresh frozen plasma, single donor plasma, red blood cellconcentrates, etc. and test blood for presence of pathogens including HBV, HCV, HIV, VDRL, Malaria, etc.	Observation only
VI	AUTOPSY	
1.	Perform an autopsy, dissect various organ complexes, and display the gross findings (Note: An improvised autopsy may also be arranged in places where full autopsy is not possible. Relevant organs from wet specimens in the museum with appropriate clinical history may be arranged for a detailed description and diagnosis. At least ten such improvised autopsies may be discussed by each candidate during the entire duration of the course)	Independently (seeNote)
2.	Provide Provisional and Final Anatomic Diagnosis report, major findings correctly and systematically at autopsy, and the Autopsy Protocol as per prescribed instructions.	Independently
VII	MOLECULAR BIOLOGY	

1.	Interpret results of Polymerase Chain Reaction (PCR), real time PCR, Sanger Sequencing in a given clinical context.	Independently
2.	Interpret results of in-situ hybridization (fluorescent and chromogenic) in a given clinical context	Independently
3.	Prepare sample by appropriate methods and perform Polymerase ChainReaction (PCR), real time PCR, Sanger Sequencing, and in-situ hybridization including troubleshooting	Observation only
VIII	IMMUNOPATHOLOGY	
1.	Interpret direct/ indirect immunofluorescence results in the context ofcommon diseases of the skin, medical renal diseases and autoimmune diseases	Independently
2.	Prepare sample by appropriate methods and perform indirect immunofluorescence on a frozen section from skin/ renal biopsy	Perform under supervision
IX	ELECTRON MICROSCOPY	
1.	Interpret transmission electron microscopy results in common non- neoplastic and neoplastic diseases	Independently
2.	Prepare specimen by appropriate methods and process tissue for electron microscopy, interpret semi-thin sections and view ultra-thinsections under electron microscope	Observation only
X.	DIGITAL PATHOLOGY	
1.	Navigate and annotate whole slide scanned images	Independently
2.	Select and scan slides for digitalization and perform basic image analysis functions such as length measurements, enumeration, etc.	Observation only
XI.	TEACHING	
1.	Demonstrate different methods of teaching-learning and assessments	Independently
2.	Engage and teach undergraduates and paramedical staff in the form of small group teaching and demonstrations	Independently

3.	Engage in peer teaching in the form of presenting seminars and journal clubs and be able to use different modes of teaching including PowerPoint projections and charts	Independently
XII.	RESEARCH	
1.	Write the thesis (and/or a scientific paper) in accordance with the prescribed instructions, as expected of international standards	Independently

## TEACHING AND LEARNING METHODS

### General principles

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents/demonstrators during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time. Maintenance of e-records of such procedures is encouraged.

The three-year training programme for the MD degree shall be arranged in the form of postings to different assignments/laboratories for specified periods as outlined below. The period of such assignments/postings is recommended for 36 months with breaks only for examinations and mandatory postings. Posting schedules shall be modified depending on needs, feasibility and exigencies. For facilities not available in our institution as well as for additional knowledge and skill, extramural postings shall be undertaken.

### Posting schedule is given below:

Sl.No	Section/Subject	Duration in months
1.	Surgical Pathology and IHC Techniques	13

2.	Haematology and Laboratory Medicine	08
3.	Cytopathology	06
4.	District Rotation Posting	03
5.	Transfusion Medicine/Blood Bank	02
6.	Autopsy and Museum techniques and record management	02
7.	Basic Sciences including Immunopathology, Electron microscopy, Molecular Biology, Research Techniques and cytogenetics, BSRC (15 days), KIDNAR (15 days), NIMHANS, Bangalore (15 days), Neuberg Anand Diagnostics, Bangalore (15 days) etc	02
	Total	36

### Teaching-Learning methods

#### Theory:

**A) Lectures:** A minimum of 10 lectures per year on certain selected topics shall be taken as lectures on subject related important topics including Recent advances

**B) Journal Club :** Journal club shall be conducted once in 2 weeks. Topics shall include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

**c) Student Seminar:** Student Seminar shall be conducted once every 1-2 weeks.

Important topics should be selected as per subject requirements and allotted for in depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student should be graded by the faculty and peers.

**D) Student Symposium: Student Symposium shall be conducted once in 2 months.**

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated

for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

**E) Laboratory work/ Interactive slide and gross sessions:** This shall be conducted once every 1-2 weeks. Laboratory work, slide and gross specimen teaching sessions shall be coordinated and guided by faculty from the department. Various methods like case-based discussions, oral or written quiz, etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions. Group discussions: This include Autopsy, clinical case discussion, biopsy review, Transparency review and grossing techniques.

**F. Interdepartmental colloquium:-** Faculty and students must attend meetings between the pathology Department and other department/s on topics of current/common interest or clinical cases. This includes institutional activities such as clinic-pathological correlation conferences (CPC), and departmental activities like autopsy conferences.

**G. a. Rotational clinical / community / institutional postings:** Depending on local institutional policy and the subject specialty needs, postgraduate trainees shall be posted in relevant departments such as microbiology, biochemistry. The aim is to acquire more in-depth knowledge as applicable to the pathology specialty.

**b. Posting under “District Residency Programme” (DRP):**

All postgraduate students pursuing MD/MS/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020). Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup>, or 5<sup>th</sup> semester of the Postgraduate programme and the rotation shall be termed as “District Residency Programme” and the PG medical student undergoing training shall be termed as “District Resident”.

**Objectives: The main objectives of the District Residency Programme (DRP) would be:**

1. To expose the post-graduate student to the District Health System/ District Hospital and involve them in health care services being provided by District Health System /District Hospital for learning while serving.
2. To acquaint them with the planning, implementation, monitoring, and assessment of outcomes of the National Health programmes at the district level.
3. To orient them to promotive, preventive, curative and rehabilitative services being provided by various categories of healthcare professionals under the umbrella of the National Health Mission.

In doing so, the post-graduate medical students would also be contributing towards strengthening of services of the District Health System as Speciality resident doctors working as members of the district teams.

#### **Training and Responsibilities of District Residents:**

The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC). During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/ sections/services at the District Health System/ District Hospital. The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Speciality and encompass night duties.

Post-graduate students of specialities where direct patient care is not involved will be trained by District Health System/ District Hospital teams within the available avenues in coordination with the District Health Officer/Chief Medical Officer. They would be trained in and contribute to the diagnostic/laboratory services, pharmacy services, forensic services, general clinical duties, managerial roles, public health programmes etc., as applicable. They may also be posted in research units / facilities, laboratories and field sites

of the Indian Council of Medical Research and other national research organizations.

### **Stipend and Leave for District Residents:**

The District Residents shall continue to draw full stipend from their respective medical colleges for the duration of the rotation subject to the attendance record submitted by the appropriate district authorities to the parent medical college/institution, based on methods and system as prescribed. Subject to exigencies of work, the District Resident will be allowed one weekly holiday by rotation. They shall also be entitled to leave benefits as per the rules/ guidelines of the parent college/university.

The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.

c) PG students shall attend additional sessions in the form of workshops on basic sciences, biostatistics, research methodology, teaching methodology & assessment and salient features of Undergraduate/Postgraduate medical curriculum with relevant entries in the log book.

### **H. Teaching research skills**

**Writing a thesis** should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member

of the department as guide and one or more co-guides who may be from the same or other departments.

**In addition to the thesis project, every postgraduate trainee shall**



**participate in at least one additional research project** that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced.

### **I. Training in Teaching skills**

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student. The postgraduate students should regularly do the ward rounds of various clinical departments and learn cases of interest for discussion with the clinical faculty.

**J. e- Logbook:** During the training period, the postgraduate student should maintain a e-Logbook indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real time. The e-logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The purpose of the e-Logbook is to:

- a) help maintain a record of the work done during training,
- b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
- c) provide feedback and assess the progress of learning with experience gained periodically.

The e- Logbook should be used in the internal assessment of the student,

should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed logbook in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination. The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program.

#### **K. Course in Research Methodology: -**

All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

#### **Other aspects:-**

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS), and complete the certificate courses, GLP.
- The Postgraduate trainees must undergo training in information technology and use of computers.

#### **Leave Rules for Post-graduate Students :-**

The following leave rules will be followed:

Every post-graduate student will be given minimum 20 days of paid leave (casual leave) per year.

Subject to exigencies of work, post-graduate students will be allowed one weekly holiday.

Female post-graduate students shall be allowed maternity leave as per existing Government rules and regulations.

Male post-graduate students shall be allowed paternity leave as per existing Government rules and regulations. In addition to 20 days' paid leave, the candidates will be allowed academic paid leave of 5 days per year. If candidate avails leave in excess of the permitted number of days, his/her term of course shall be extended by the same number of days to complete the training period. However, one shall be able to appear in the examination if one has 80% (eighty per cent) of the attendance.

## **ASSESSMENT**

**FORMATIVE ASSESSMENT:** is performed continuously during the training to assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system by means of work place based assessment.

### **General Principles**

Internal Assessment is frequently conducted to cover all domains of learning and used to provide feedback to improve learning; it also covers professionalism and communication skills. The Internal Assessment will be conducted in theory and practical / Clinical examination at the end of every year.

### **Quarterly assessment during the MD training should be based on:**

- Case presentation, case work up,  
case handling/management : once a week
- Laboratory performance : twice a week
- Journal club : once a fortnight
- Seminar : once a fortnight
- Case discussions : once a fortnight/month
- Interdepartmental case or seminar : once a month

**Note:** These sessions may be organized and recorded as an institutional activity for all postgraduates.

- Attendance at Scientific meetings, CME programmes (at least 02 each)

**The student shall be assessed periodically as per categories listed in appropriate pathology postgraduate student appraisal form (Annexure I).**

## **SUMMATIVE ASSESSMENT (AS PER THE RULES GIVEN IN POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2023)**

**Essential pre-requisites for appearing for examination include:**

(Revised University Eligibility requirements for Post graduate students)

1. E-Log Book - Logbook of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.
2. Have minimum one Poster presentation or Podium presentation at a National/Zonal/State conference of his/her specialty.
3. Have minimum one Research paper published in journal of his/her specialty as first author.
4. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
5. Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
6. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
7. Thesis acceptance by all evaluators before the conduct of University Examination.

**Attendance:** A student will require minimum of 80% attendance of working days (i.e. 751 days of 939 days) for appearing in the examination. However, period of training will be extended by the same number of days for which maternity/paternity leave and total excess casual leaves have been availed in three years.

**Allowed leaves for Post-graduate students:** Weekly one-day off (subject to exigencies of work). In addition, they are eligible for twenty days Paid Casual Leave. Five days Academic Leave per year, if availed by a student will be counted as duty. Thus, a student is entitled to 52 weekly offs and 20 Paid Casual Leave per year. Female post-graduate students shall be allowed maternity leave as per existing government rules and regulations. Male post-graduate students shall be allowed paternity leave as per existing government rules and regulations. However, period of training will be extended by the same number of days for which maternity/paternity leave have been availed.

### **Post Graduate Examination**

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2023.**

**The Post Graduate examination will be in three parts:-**

#### **1. Thesis:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical /Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

#### **2. Theory:**

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four theory papers:

**Paper I:** General Pathology, Pathophysiology, Immunopathology, molecular biology, Autopsy and Techniques- surgical pathology

**Paper II:** Systemic Pathology – surgical and cytopathology, Applications of techniques in surgical and cytopathology

**Paper III:** Haematology, Transfusion Medicine (Blood Banking), Laboratory Medicine including instrumentation and quality control

**Paper IV:** Recent advances and applied aspects

Each theory paper will be of 100 marks & 3 hours duration. There will be 10 questions of 10 mark each.

**Note: The distribution of chapters/topics shown against the papers are suggestive only and may overlap or change.**

### **3. Practicals /Clinical and Oral/viva voce Examination:**

Practical examination should be spread at least over two days for each student and include various major components of the syllabus focusing mainly on the psychomotor domain. Oral/Viva voce examination on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

#### **I. Clinical Pathology:**

- ☐ Discussion of a clinical case history.
- ☐ Plan relevant investigations of the above case and interpret the biochemistry findings.

☐ Two investigations should be performed including at least one biochemistry exercise/clinical pathology exercise like CSF, pleural tap etc. analysis and complete urinalysis.

## **II. Haematology:**

- ☐ Discuss haematology cases given the relevant history. Plan relevant investigations
- ☐ Perform complete hemogram and at least two tests preferably including one coagulation exercise
- ☐ Identify electrophoresis strips, osmotic fragility charts etc. Interpretation of data from auto analysers, HPLC and flow cytometry.

Examine, report and discuss around ten cases given the history and relevant blood smears and/or bone marrow aspirate smears and bone marrow biopsy interpretation.

## **III. Transfusion Medicine:**

- ☐ Perform blood grouping
- ☐ Perform the necessary exercise like cross matching.
- ☐ Coomb's test, gel cards interpretation.

## **IV. Histopathology:**

- ☐ Examine, report and discuss 12-15 cases histopathology and 5-8 cytopathology cases, given the relevant history and slides.
- ☐ Perform a Haematoxylin and Eosin stain and any special stain on a paraffin section. Should be conversant with histopathology techniques including cryostat.

## **V. Autopsy:**

- ☐ Given a case history and relevant organs (with or without slides), give a list of anatomical diagnosis in a autopsy case.

## **VI. Gross Pathology**

- ☐ Describe findings of gross specimens, give diagnosis and identify the sections to be processed. The post graduate student shall perform grossing in front of the examiners for evaluation.

## **VII. Basic Sciences:**

- ☐ 10-15 spots based on basic sciences be included
- ☐ Identify electron micrographs



- ☐ Identify gels, results of PCR, immunological tests including interpretation of immunofluorescence pictures.
- ☐ Identify histochemical and immuno-histochemistry stains

### **VIII. Teaching exercise 10 min**

All practical exercises shall be evaluated jointly by all the examiners.

An oral question-answer session shall be conducted at the end of each exercise.

(a) Viva on dissertation and research methodology

(b) General Viva-Voce

### **Theory Examination:**

**400 Marks**

**Duration : 3 hours**

Paper 1	General Pathology, Pathophysiology, Immunopathology, Molecular Biology, Autopsy and Techniques- surgical pathology	10 Questions of 10 marks each	100 marks
Paper 2	Systemic Pathology- Surgical and Cytopathology, Applications of techniques in surgical and cytopathology	10 Questions of 10 marks each	100 marks
Paper 3	Haematology, Transfusion Medicine (Blood Banking) Laboratory Medicine including instrumentation and quality control	10 Questions of 10 marks each	100 marks
Paper 4	Recent advances and applied aspects	10 Questions of 10 marks each	100 marks

### **Practical Examination:**

**400 Marks**

**Practicals : 280 marks**

**Thesis : 20 marks**

**Viva voce : 100 marks**

**Duration - 2 days**

**PRACTICALS****280 MARKS**

<b>DAY 1</b>		
a)	Autopsy / Reconstructed autopsy (organ systems)	20 Marks
b)	Haematology & Cytology slides : 8+5 slides	50 marks (30+20)
c)	Gross Specimens (4 Specimens)	20 marks
d)	Histopathological Techniques: 1. Frozen section & Block cutting - 10 marks 2. Staining – Special stain and H & E stain - 20 marks 3. Cytology stain - 10 marks	40 marks
e)	Haematology and clinical pathology (i) Clinical case/History/clinical data discussion (ii) Haematology exercise including Blood Banking	25 Marks
<b>DAY 2:</b>		
a)	Histopathology slides - 15 slides	60 Marks
b)	Histopathology case discussion with complete workup including IHC	20 marks
c)	OSPE, Basic sciences: 25 (5 Stations x 5 marks) Performance stations - 3 1. PT / APTT 2. Blood grouping 3. Cross matching Question & Interpretation Station - 2 - Flow cytometry, Immunofluorescence, Electron Micrographs, Histochemical stains, IHC, Coomb's test, Gel card tests, PCR etc	25 marks
d)	Pedagogy	20 marks
	<b>DISSERTATION VIVA</b>	<b>20 marks</b>
	<b>VIVA VOCE</b>	<b>100 marks</b>

**Criteria for evaluation of MD Pathology Course:**

The candidate shall secure not less than 50% marks in each head of passing which shall include

- (1) Theory - aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)
- (2) Practical/Clinical and Viva voce - aggregate 50%
- (3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.
- (4) Five per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. External examiner outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce.
- (5) No grace mark is permitted in post-graduate examination either for theory or for practical.
- (6) The University shall conduct not more than two examinations in a year for any subject, with an interval not less than 4 months & not more than 8 months between the two examinations.

**Recommended Reading: Books (latest edition)**

1. Histology for Pathologists. Stephen S. Sternberg (Ed), Raven Press, New York.
2. Robbin's Pathologic Basis of Disease Ramzi S.Cotran, Vinay Kumar, Stanley LRobbins WB Saunders Co., Philadelphia.
3. Ackerman's Surgical Pathology. Juan Rosai Mosby. St. Louis.
4. Diagnostic Surgical Pathology. Stephen S Sternberg.

- Lippincott, William Wilkins. Philadelphia.
5. Diagnostic Histopathology of Tumours. Christopher DM Fletcher (Ed). Churchill Livingstone. Edinburgh.
  6. Manual & Atlas of Fine Needle Aspiration Cytology. Svante R Orell, et al London.
  7. Theory and Practice of Histological Techniques, Bancroft JD, Stevens A, Turner DR, Churchill Livingstone, Edinburgh.
  8. Diagnostic Cytology and its Histopathologic Basis, Koss LG, J.B. Lippincott, Philadelphia.
  9. Comprehensive Cytopathology, Bibbo M, W.B. Saunders Co., Philadelphia.
  10. Wintrobe's Clinical Hematology, Lee GR, Foerster J, Lupeus J, Paraskevas F, Gveer JP, Rodgers GN, Williams & Wilkins, Baltimore.
  11. Atlas and Text of Hematology 4<sup>th</sup> edition. Singh T. Avichal Publishing Company.
  12. Dacie and Lewis Practical Hematology, Bain BJ, Bates I, Laffan MA. Elsevier.
  13. Bone Marrow Pathology, Bain BJ, Clark DM, Lampert IA, Blackwell Science, Oxford.
  14. Henry's clinical diagnosis and management by laboratory methods.
  15. WHO classification of tumors. IARC Lyon.

### **Journals**

1. Acta Cytologica
2. Journal of Pathology
3. Histopathology
4. British Journal of Haematology
5. Blood
6. Journal of Clinical Pathology
7. Diagnostic Cytopathology
8. Human Pathology
9. New England Journal of Medicine
10. Indian Journal of Pathology and M
11. Lancet
12. American Journal of Surgical Pathology

13. Cancers

14. Modern Pathology

### Annexure I

Student appraisal form for broad specialty non-clinical disciplines											
	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic aptitude and learning</b>										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc)										

1.4	Documentati on of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
<b>2</b>	<b>Work related to training</b>										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										

<b>2.5</b>	Ability to record and document work accurately and appropriate for level of training										
<b>3</b>	Professional attributes										
<b>3.1</b>	Responsibility and accountability										
<b>3.2</b>	Contribution to growth of learning of the team										
<b>3.3</b>	Conduct that is ethically appropriate and respectful at all times										
<b>4</b>	Space for additional comments										



5	Disposition										
	Has this assessment pattern been discussed with the trainee? Yes/ No										
	If not explain.										
	Name and Signature of the assesse										

	Name and Signature of the assessor										
	Date										

### Annexure 2

#### Criteria for evaluation of dissertation (Tick whichever is appropriate)

S. No	Criterion	Adequate	Inadequate
1	Title of the study		
2	Research Background & Objectives		
3	Research Methodology utilized in accordance with the objectives		
4	Depiction of results		
5	Discussion		
6	Conclusion		
7	References		

# **GUIDELINES FOR COMPETENCY-BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN PHARMACOLOGY**

## **Revised PG Curriculum**

### **Preamble**

The purpose of the postgraduate (PG) education is to create specialists who would provide high quality education, health care and advance the cause of science through research and training. Pharmacology consists of both experimental and clinical sciences. The experimental component is essential in understanding the drug action in diseases as well as for the research in drug discovery and development. Clinical application of pharmacology concepts is essential for rational prescribing practices, rational therapeutics, clinical trials, rational use of drugs including antimicrobials, pharmacovigilance and pharmacology consults.

The job prospects for a medical pharmacologist have evolved over time along with a congruent rise in the demand for trained pharmacologists in India, both in academics as well in other areas such as pharmacovigilance centres, regulatory bodies, national research institutes, pharmaceutical industry and as scientific writers or science managers. Hence, a PG student in Pharmacology should be competent to meet the growing challenges in job requirements at all levels in various fields and organizations. Considering the emerging trends in pharmacology & therapeutics, clinical applications of the subject, its role in national programs, evolving integrated course schedules while broadening the subject scope and number of students seeking to join the PG degree in pharmacology, there is huge demand to standardize and update PG curricular components including competencies, teaching learning methods and assessment methods in the MD pharmacology course in India. This requires integration of pharmacology with other sciences including basic, para-clinical and clinical disciplines.

A pragmatic approach to postgraduate pharmacology teaching in India is a key step towards addressing the aforesaid challenges and facilitating a fresh curriculum design. The purpose of this document is to provide teachers and learners comprehensive guidelines to achieve the defined competencies through various teaching-learning and assessment strategies. This document was prepared by various subject and education experts of the national Medical Commission. The subject Expert Group has attempted to render uniformity without compromising the purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

### **PHARMACOLOGY SPECIFIC LEARNING OBJECTIVES (GOALS)**

At the end of the MD training programme in Pharmacology, the student should meet the following goals:

#### **1. Acquisition of knowledge**

The student should be able to clearly explain concepts and principles of pharmacology and therapeutics, drug development processes, the drugs and cosmetics act, rational use of drugs, antimicrobial resistance, pharmacovigilance, pharmacy, health economics, clinical trial processes and relevant national programs.

## **2. Acquisition of Skills**

The student should be able to develop and apply skills in pharmacology-based services (e.g. rational prescribing), in self-directed learning for evolving educational needs and scientific information, in conduct of research and in managerial assignments in the department/institution.

## **3. Teaching and training**

The student should be able to effectively teach and assess undergraduate medical students (MBBS) and allied health science courses (Dentistry, Nursing, Physiotherapy) so that they become competent healthcare professionals and are able to contribute to training of undergraduates (UG) and postgraduates.

## **4. Research**

The student should be able to conduct a research project (in both basic and clinical pharmacology) from the planning to the publication stage and be able to pursue academic interests and continue life-long learning to become a more experienced teacher & mentor in all the above areas and to eventually be able to guide postgraduates in their thesis, research work and all other academic activities.

## **5. Professionalism, Ethics and Communication skills**

The student should be able to learn and apply principles of professionalism, ethics and effective communication in conduct of research, pharmacology-based services, educational activities and day to day work.

# **PHARMACOLOGY SPECIFIC COMPETENCIES**

The competencies will have a judicious mix of all domains of learning and usually are predominant in one domain. The postgraduate student during the training program should acquire the following competencies to achieve the defined five goals:

## **A. Predominant in Cognitive domain**

The MD Pharmacology student after training in the course should be able to:

**General Pharmacology:**

1. Demonstrate an understanding of the basic principles of Pharmacology including molecular pharmacology.
2. Demonstrate an awareness of the historical journey and contributions of scientists in the drug development process.
3. Describe the process of new drug development including preclinical and clinical phases.
4. Describe principles of pharmacokinetics of drugs and apply these to prescribe medicines for individualization of pharmacological therapy, including use of medicines in special categories (Pediatrics, Geriatrics, Pregnancy and Pathological states).
5. Explain the principles of pharmacodynamics and apply these in different therapeutic situations.
6. Describe mechanisms of drug-drug interactions and their clinical importance.
7. Describe the principles of pharmacogenomics and its clinical significance.
8. Describe pharmacological principles underlying the effects of drugs used in diagnosis, prevention and treatment of common systemic diseases in man.
9. Demonstrate an understanding of the factors that modify drug action.
10. Define Therapeutic Drug Monitoring (TDM), describe the methods of TDM and importance in therapeutic decision making.
11. Describe the principles and importance of Pharmacoeconomics in healthcare delivery. Describe the methods in pharmacoeconomic studies and the economic considerations in the use of medicines in individuals and in the community.
12. Describe the principles, methods and importance of pharmacoepidemiology, including drug utilization studies.
13. Define pharmacovigilance. Describe the importance of pharmacovigilance in ensuring patient safety and the various methods/procedures in pharmacovigilance.
14. Describe the role of Essential Medicines in rational therapeutics. Describe principles for selecting Essential Medicines for a defined healthcare delivery system.
15. Demonstrate an understanding of principles of rational prescribing.
16. Demonstrate an understanding of prescription analysis and be able to conduct prescription analysis in a healthcare facility.
17. Demonstrate an understanding of antimicrobial resistance, antibiogram, antimicrobial stewardship program and strategies for containment of antimicrobial resistance.

**Systemic Pharmacology:**

1. Apply and integrate knowledge of pathophysiology of diseases and pharmacological principles underlying the effects of drugs, for the purpose of diagnosis, prevention and treatment of common systemic diseases in man including disorders of:

- a. Synaptic & neuroeffector junctional sites of the autonomic nervous system
  - b. Neuromuscular junction
  - c. Central nervous system
  - d. Cardiovascular system
  - e. Endocrine system
  - f. Gastrointestinal system
  - g. Respiratory system
  - h. Renovascular system
  - i. Hematological system
  - j. Immunological system
  - k. Autacoids
2. Describe the mechanism of action, pharmacological effects and therapeutic status of drugs used for prevention and management of microbial and parasitic infections/infestations and neoplastic disorders.
  3. Describe the pathophysiological basis and management of common poisonings.
  4. Demonstrate an awareness about the recent advances in pharmacology and therapeutics.
  5. Demonstrate an understanding of the special considerations in pharmacokinetics, mechanism of action, pharmacological effects and therapeutic status of drugs used for dermatological and ocular disorders.

### **Research:**

1. Demonstrate an understanding of the importance and ethical considerations of biomedical research in animals and man.
2. Describe the principles and methods of biomedical research in animals and man.
3. Describe the current principles of Good Clinical Practice (GCP) and Good Laboratory Practice (GLP) guidelines, as applicable.
4. Demonstrate an understanding of the different tools and methods for literature search.
5. Describe and apply the principles of biostatistics in the evaluation and interpretation of efficacy and safety studies of drugs in man. Apply and interpret the various statistical tools in biomedical research.
6. Demonstrate an understanding of the principles of Good Publication practices as applicable to publication of research studies.
7. Describe different methods of drug assays - biological, chemical, immune-assay including knowledge of analytical techniques like HPLC, TLC etc. and their applications in therapeutics.

- Describe the methods for screening/evaluation of various pharmacological agents like analgesics, antipyretics, anticonvulsants, anti-inflammatory drugs, antidepressants, antianxiety and antipsychotics, sedatives, muscle relaxants, antihypertensives, hypocholesterolemic agents, antiarrhythmic drugs, antidiabetics, local anaesthetics, antifertility agents, diuretics, adrenergic blocking drugs, drugs used in peptic ulcer diseases and drugs affecting learning and memory etc. in animals and man.
8. Describe the regulatory and ethical issues involved in drug development and research.

### **Teaching and Assessment:**

1. Demonstrate an awareness about the salient features of Undergraduate Medical Education Curriculum in India.
2. Demonstrate an awareness about Postgraduate Medical Education Curriculum and Guidelines in India.
3. Describe the principles of teaching-learning technology and apply these to conduct classroom lectures, self-directed learning (SDL) sessions, Case-Based Learning (CBL), case discussions, integrated teaching, small group discussions, seminars, journal club and research presentations.
4. Describe the principles of assessment of learning and be able to use the different methods for assessment of undergraduate students in pharmacology.
5. Demonstrate knowledge about the utility of computer assisted learning and be able to use them efficiently to promote learning of pharmacology.

*Note: A postgraduate student is expected to be knowledgeable about all aspects of the subject and be updated about the contemporary advances and research in the subject.*

### **B. Predominant in Affective Domain**

The students after training in the MD (Pharmacology) course should be able to:

1. Effectively explain to patients, the effects, appropriate use and adverse effects of drugs, including drug interactions and the need for medication adherence.
2. Communicate effectively with students, peers, staff, faculty and other members of the health care team about rational use of medicines and improving spontaneous reporting of adverse drug reactions, with pharmacological reasoning
3. Demonstrate respect in interactions with peers, patients and other healthcare professionals.
4. Demonstrate professionalism, ethical behavior and integrity in one's work.
5. Demonstrate ability to generate awareness about the use of generic drugs in various conditions.



6. Acquire skills for self-directed learning to keep up with advances in the subject and to improve the skills and expertise towards continuous professional development.

## **C. Predominant in Psychomotor Domain**

### **a. Mandatory**

**i. The students after training in the MD (Pharmacology) course should be able to *perform the following procedures independently or as a part of a team and/or interpret the results:***

1. Predict, report, monitor and participate in the management and causality assessment of adverse drug reactions associated with use of drugs, as per national program.
2. Demonstrate skills for writing rational prescriptions and prescription analysis.
3. Demonstrate proper use of equipment following the SOPs e.g. organ bath, analgesiometer, physiograph, convulsimeter, plethysmograph, equipment for testing/measuring learning and memory, affective disorders, muscle relaxants, blood pressure, ECG, respiration and pain.
4. Prepare drug solutions of appropriate strength and volume.
5. Determine  $EC_{50}$ ,  $ED_{50}$ ,  $pD_2$  and  $pA_2$  values of drugs.
6. Demonstrate presentation skills in a classroom setting as well as in academic meetings at local and national levels.
7. Provide critical appraisal of a research paper.
8. Perform experiments to demonstrate and interpret the dose response curve and effect of agonists (in the presence or absence of an antagonist) on simulations.
9. Perform the following:
  - Design protocol for evaluation of a given drug for various phases of clinical trials.
  - Prepare Informed Consent Form and Participant Information Sheet for clinical trials/research.
  - Administer Informed Consent Form
  - Evaluate promotional drug literature
  - Prepare “Package insert”
  - Calculate and interpret pharmacokinetic parameters of a drug from a given data
  - Demonstrate skills to prepare material for teaching-learning and assessment.

**ii. The students after training in the MD (Pharmacology) course should be able to *do/perform following procedures under supervision:***

10. Test and predict efficacy of drugs following appropriate guidelines and regulations e.g. drugs affecting memory and psychomotor functions (e.g. critical flicker fusion tests in human volunteers), pain, cardiovascular functions, respiratory functions etc.
11. Observe and understand basic principles of working of important contemporary drug analytical techniques, interpret the observations about the drug levels and their therapeutic applications.
12. Demonstrate skills for contributing to antibiotic stewardship program of the institute to manage antimicrobial resistance.
13. Demonstrate Standard Operating Procedures (SOPs) for various methods and techniques used in pharmacology including SOPs in clinical trials and research.
14. Administer drugs by various routes (subcutaneous, intravenous, intraperitoneal) in simulations and hybrid models.
15. Demonstrate acquisition of writing skills for scientific publications and research projects for funding agencies and approval by Ethics Committee.
16. Demonstrate scientific writing skills.

**b. Desirable:** The students after training in the MD (Pharmacology) course should be able to:

17. Collect blood samples and oral gavage from experimental animals.
18. Administer drugs by various routes (subcutaneous, intravenous, intraperitoneal) in experimental animals.
19. Perform in vivo and in vitro screening/evaluation of various pharmacological agents like analgesics, antipyretics, anticonvulsants, anti-inflammatory drugs, antidepressants, antianxiety and antipsychotics, sedatives, muscle relaxants, antihypertensives, hypocholesterolemic agents, antiarrhythmic drugs, antidiabetics, local anaesthetics, antifertility agents, diuretics, adrenergic blocking drugs, drugs used in peptic ulcer diseases and drugs affecting learning and memory etc in animals or simulated experiments and interpret the observations and relate these to potential clinical applications of the experimental drug and man
20. Perform experiments to demonstrate and interpret the dose response curve and effect of agonists (in the presence or absence of an antagonist) on various biological tissues.

**Note: All animal experiments shall be compliant with the Regulations of Government of India, notified from time to time. Amphibian/Dog/Cat experiments shall be conducted by computer assisted simulation models/facilities. Other experiments shall be performed as permissible by existing 'Committee for the Control and Supervision of Experiments on Animals (CCSEA)' guidelines and other Government regulations.**

## Syllabus

## **Course content**

### **Theory:**

#### **❖ Basic and General Pharmacology:**

Basic Principles of Pharmacodynamics and Pharmacokinetics, Molecular Pharmacology, Historical aspects of drug discovery, Evaluation of new drug in animals and man, Gene based therapy and drug abuse, Pharmacoepidemiology, Pharmacogenomics, pharmacogenetics, P-drug, Drug delivery systems, Over the counter drugs, generic drugs, drugs banned in India, Dietary supplements and herbal medicines

### **Toxicology:**

General principles of toxicology including pathophysiological basis and management of common poisonings, Heavy metal poisoning, non-metallic toxicants like air pollutants, pesticides etc.

#### **❖ Clinical Pharmacology :**

- Principles of rational use of drugs and rational prescribing, Essential drug concept
- Principles of Clinical Pharmacokinetics and their application in drug treatment, including use of drugs in special population like different age groups, Pregnancy, lactation and Disease conditions
- Clinical trials –conduct of clinical trials, ethical issues in clinical trials, informed consent and SOP-Standard operating procedures of clinical trials
- Therapeutic drug monitoring, Adverse drug event monitoring and reporting (Pharmacovigilance), Adverse drug interactions, Drug information
- Pharmacometrics- methods of drug evaluation
- Pharmacoeconomics
- Functioning of the Drugs and Therapeutics Committee.
- Hospital formulary development
- Drug information services.
- Medication error detection and mitigation advice.
- Antimicrobial resistance and antibiotic stewardship.
- Prescription auditing
- Drug counselling - explain to patients, the effects and adverse effects of drugs, including the need for medication adherence
- Emergency drugs used in crash cart/ resuscitation

#### **❖ Systemic Pharmacology and Therapeutics:**

Pharmacology of drugs acting on various organ system & drug treatment of disease

conditions :

- Autonomic Pharmacology
- Drugs acting on Smooth muscles
- Drugs acting on Synaptic and Neuro effector Junctional sites
- Drugs acting on Central Nervous System (Sedative, Hypnotics, Antiepileptics, General Anesthetics, Local Anesthetics, Skeletal Muscle Relaxants, Antipsychotic, Antidepressants, Drugs used in Parkinson's disease and other neurodegenerative disorders, opioid agonists and antagonists, Drugs of abuse)
- Drugs modifying renal function
- Drugs acting on cardiovascular system and haemostatic mechanisms (Antihypertensives, Antianginal, Antiarrhythmics, Drugs used in heart failure, Drugs used in Dyslipidemias, Fibrinolytics, Anticoagulants, Antiplatelets)
- Reproductive Pharmacology
- Agents effecting calcification and bone turnover
- Autacoids and related pharmacological agents (NSAIDs) and drugs used in Rheumatoid arthritis and Gout
- Gastrointestinal drugs
- Pharmacology of drugs affecting the respiratory system (drugs used in Bronchial Asthma and COPD)
- Chemotherapy: General principles and various Antimicrobials
- National programmes for infectious and vector borne diseases including the regimes
- Chemotherapy of neoplastic disease
- Drugs used in Autoimmune disorder and Graft versus Host Disease
- Dermatological pharmacology
- Ocular pharmacology
- Immunomodulators - immunosuppressants and immunostimulants
- Pharmacology of drugs used in endocrine disorders (drugs used in diabetes mellitus, hypothalamic and pituitary hormones, thyroid and antithyroid drugs, adrenocorticotrophic

hormones and their antagonists, gonadal hormones and their inhibitors)

- Screening procedures for various drug categories in humans and animals.
- Antiparasitics, disinfectants, antiseptics

❖ Biomedical research (in humans and animals ) and related Regulations

- Literature search
- Principles of Good Clinical Practice (GCP)
- Good Laboratory Practice (GLP) guidelines Good publication practices
- Recent regulatory guidelines for drugs/research and clinical trials
- Drug development and research and ethical issues involved in it
- Research protocol development, research study conduct, experimental observations, analysis of data using currently available statistical software
- Emergency use authorization for drugs eg., vaccine development
- Ethical issues related to research on animals, humane animal research (principles of 3Rs) and alternatives to animal experimentation
- Ethical guidelines of ICMR, INSA for Breeding and conducting Experiments on Animals (Control and Supervision) Rules 1998.
- Animal experiments: Regulatory Guidelines (CPCSEA), humane animal research (principles of 3Rs) and alternatives to animal experimentation.
- Anaesthetics used in laboratory animals

❖ **Experimental Pharmacology:**

- Describe the methods for screening/evaluation of various pharmacological agents like analgesics, antipyretics, anticonvulsants, anti-inflammatory drugs, antidepressants, antianxiety and antipsychotics, sedatives, muscle relaxants, antihypertensives, hypocholesterolemic agents, antiarrhythmic drugs, antidiabetics, local anaesthetics, antifertility agents, diuretics, adrenergic blocking drugs, drugs used in peptic ulcer diseases and drugs affecting learning and memory etc in animals and man.

❖ **Biostatistics:**

- Basic principles and their application in drug research.
- Recent advances in Pharmacology

❖ **Biochemical Pharmacology**

- Basic principles and applications of simple analytical methods
- Principles of quantitative estimation of drugs, endogenous compounds and poisons using Colorimetry, Spectrophotometry, flame photometry, High Performance Liquid Chromatography (HPLC) and enzyme-linked immunosorbent assay (ELISA).

❖ **Education**

- Salient features of Undergraduate Medical Education Curriculum in India.
- Postgraduate Medical Education Curriculum and Guidelines in India.
- Principles of teaching - learning methods and technology
- Principles of assessment of learners

**Practicals:**

**1) Experiments on Laboratory Animals:**

**A. Isolated tissue experiments: (BIOASSAY)**

- a) Rat – uterus, phrenic nerve diaphragm, fundus, vas deferens, colon, etc.
- b) Guinea Pig – ileum, vas deferens, heart (Langendorff's preparation), tracheal chain, duodenum etc.
- c) Rabbit – heart (Langendorff's preparation), jejunum, duodenum, aortic strip etc

**B. Principles of EC<sub>50</sub>, ED<sub>50</sub>, pD<sub>2</sub> and pA<sub>2</sub> values of drugs**

**C. General screening and evaluation of whole animal experiments:**

- i. Screening of the drugs for the following activities:
  - Anti-anxiety

- Anti depressant
  - Anti – convulsant
  - CNS stimulants
  - Sedative and hypnotic
  - Muscle relaxants
  - Anti-inflammatory
  - Analgesic, Antipyretics
  - Anti-diabetic
  - Antihypertensive
  - Anti-arrhythmic
  - Anti adrenergic
  - Antipsychotics
  - Hypcholesterolemic agents
  - Diuretics
  - Drugs used in peptic ulcer diseases/Prokinetic agents/ antiemetics
  - Antitussives, /anti-asthma agents
  - Oxytocics, antifertility agents
  - Behavioral pharmacology models and evaluation of drugs affecting learning and memory
- ii. In rabbit & guinea pig to screen the drugs for their :
- Local anesthetic activity
  - Mydriatic and miotic activity
- iii. In cat / dog (Computer Aided) to identify the nature of the drug by observing its effect on:
- Blood pressure
  - Respiration
  - Nictitating membrane
  - Intestinal movement

2)



Technique demonstration:

- i) Blood withdrawal :
  - Rat– Tail vein, retro-orbital sinus puncture, cardiac puncture.
  - Rabbit – Marginal ear vein.
- ii) Intravenous/intraperitoneal/subcutaneous/oral drug administration in rat, rabbit and mouse
- iii) Measuring pedal volume
- iv) Rat vaginal smear preparation & interpretation.
- v) Anesthetics used in laboratory animals

### **3. Clinical Pharmacology**

- Demonstration of drug administration through various routes on Mannequines
- Demonstration of effects of drugs/interpretation of results in humans
- Protocol Writing for various phases of clinical trials
- ADR reporting (Pharmacovigilance )
- Analysis of Prescriptions
- Calculation of kinetic parameters
- Selection of P-drug
- Estimation of Pharmacoeconomic parameters

### **4. Biochemical Pharmacology Experiments**

- Immunoassays: Concept and their application/s
- Simple tests for detecting the chemical nature of drugs (alkaloids, glycosides, steroids, lead, fluoride etc).
- Principles of quantitative estimation of drugs, endogenous compounds and poisons using Colorimetry, Spectrophotometry, flame photometry, High Performance Liquid Chromatography (HPLC) and Enzyme-Linked Immunosorbent assay (ELISA).

## **TEACHING AND LEARNING METHODS**

All students joining the postgraduate courses shall work as full-time (junior) residents during the period of training, **attending not less than 80% of the training activity during the**

**calendar year**, and participating in all assignments and facets of the educational process. They shall maintain a log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

**Theory:**

a) Lectures:

A minimum of 10 lectures per year on certain selected topics shall be taken as lectures.

b) Journal Club

Journal club shall be conducted once a week. Topics shall include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook.

A time table for the subject with names of the students and the moderator shall be announced in advance.

c) Subject Seminar

Recommended to be held once a week. Important topics shall be selected and allotted for in- depth study by a postgraduate student. A teacher shall be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive evidence-based review of the topic. The student shall be graded by the faculty.

d) **Student Symposium/ Interdepartmental colloquium** Minimum once every 6 months.

A broad topic of significance shall be selected, and each part shall be dealt by one postgraduate student. A teacher moderator shall be allocated for each symposium and moderator shall track the growth of students during moderation. Such **Symposium** shall aim at complete evidence-based review of the topic. All participating postgraduates shall be graded by the faculty. Alternately, post graduates shall attend **Interdepartmental colloquium** meetings between the Department of Pharmacology and other departments on topics of current/common interest or clinical cases.

e) PG students shall attend additional sessions in the form of workshops on basic sciences, biostatistics, research methodology, teaching methodology & assessment and salient features of Undergraduate/Postgraduate medical curriculum with relevant entries in the log book.

f) **UG Teaching:** Post graduate students shall teach undergraduate students by taking lectures, small group teaching and demonstrations using Computer Animal Simulation Laboratory (CASL)

g) PG students shall attend accredited scientific meetings (CME, symposia, and conferences)

### **PRACTICAL/CLINICAL TRAINING:**

**1) Research Activities: The Post-graduate students should conduct dissertation work and in addition carry out a short research project in the department other than dissertation work.**

**2) Experimental Pharmacology-** In vitro (including bioassays), in vivo (including common methods of evaluation), computer simulation and toxicity tests

**3) Clinical Pharmacology-**

- (1) Evaluation of drugs in healthy volunteers as well as patients
- (2) Critical evaluation of drug literature, Pharmacoeconomics, pharmacovigilance and Pharmacoepidemiology
- (3) Short project
- (4) Rotational Postings in other Departments:

A candidate of the M.D Degree Course in Pharmacology needs to be well versed in the applied aspects of pharmacology and therapeutics by attending rounds during clinical postings and learn about the recent drugs used presently in clinical practice, also discuss the rationality of the prescription with the staff. Postings in the wards of the Clinical departments will help the candidate get acquainted with the patterns of drug use, adverse drug reactions and interactions etc. Such postings will also help them to improve their communication skills. Every posting shall have defined learning objectives derived in conjunction with the collaborating department/s or unit/s.

The following clinical postings are recommended:

Clinical Postings	REVISED (duration)

<b>Medicine</b>	2 weeks
<b>Anaesthesia</b>	2 weeks
<b>Dermatology</b>	1 week
<b>Pediatrics</b>	1 Week
<b>Psychiatry</b>	2 weeks
<b>Microbiology/ Infection control unit or dept</b>	2 weeks
<b>Biochemistry / BSRC</b>	2 weeks
<b>Clinical trial unit (SMO) /Research unit / Pharmaceutical industry</b>	2-8 weeks (as per availability)
<b>Pharmacovigilance</b>	2 weeks
<b>DRP</b>	3 months
<b>Total Duration of postings</b>	8 1/2 months

(Monitoring of clinical postings, would be through weekly discussions about interesting cases with critical appraisal of prescriptions).

In addition candidate shall be posted for Pharmacovigilance posting in hospital to get acquainted to procedures involving in reporting adverse drug reactions

#### **Biochemical Pharmacology-**

- Candidate shall be posted at BSRC ( Basic Science Research Centre)/ Department of Biochemistry to get acquainted to procedures like Identification of drugs/toxins by

using chemical, biological and analytical tests and Quantitative estimation – use of colorimeter, spectrophotometer and/or other advanced analytical equipment.

- Microbiology/ Infection control unit or dept: Candidate shall be posted to Department of Microbiology to get acquainted to infection control measures and antimicrobial stewardship

Candidate shall be posted at **SMO (Site Management Office)** to get acquainted to procedures or skills for conducting clinical trials. Alternately, candidate desirous to attend industrial posting shall be posted at renowned pharmaceutical industries to get hands on experience of the working culture and skills of the industries.

#### **Posting under “District Residency Programme” (DRP):**

All postgraduate students pursuing MD in Pharmacology shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2020).

Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme and the rotation shall be termed as “District Residency Programme” and the PG medical student undergoing training shall be termed as “District Resident”.

#### **Objectives: The main objectives of the District Residency Programme (DRP) would be:**

4. To expose the post-graduate student to the District Health System/ District Hospital and involve them in health care services being provided by District Health System /District Hospital for learning while serving;
5. To acquaint them with the planning, implementation, monitoring, and assessment of outcomes of the National Health programmes at the district level.
6. To orient them to promotive, preventive, curative and rehabilitative services being provided by various categories of healthcare professionals under the umbrella of the National Health Mission.

In doing so, the post-graduate medical students would also be contributing towards strengthening of services of the District Health System as Speciality resident doctors working as members of the district teams.

### **Training and Responsibilities of District Residents:**

The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC). During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/ sections/services at the District Health System/ District Hospital. The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Speciality and encompass night duties.

Post-graduate students of specialities where direct patient care is not involved will be trained by District Health System/ District Hospital teams within the available avenues in coordination with the District Health Officer/Chief Medical Officer. They would be trained in and contribute to the diagnostic/laboratory services, pharmacy services, forensic services, general clinical duties, managerial roles, public health programmes etc., as applicable. They may also be posted in research units / facilities, laboratories and field sites of the Indian Council of Medical Research and other national research organizations.

### **Stipend and Leave for District Residents:**

The District Residents shall continue to draw full stipend from their respective medical colleges for the duration of the rotation subject to the attendance record submitted by the appropriate district authorities to the parent medical college/institution, based on methods and system as prescribed. Subject to exigencies of work, the District Resident will be allowed one weekly holiday by rotation. They shall also be entitled to leave benefits as per the rules/ guidelines of the parent college/university.

The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.

#### **4) Leave Rules for Post-graduate Students**

The following leave rules will be followed:

Every post-graduate student will be given minimum 20 days of paid leave (casual leave) per year.

Subject to exigencies of work, post-graduate students will be allowed one weekly holiday.

Female post-graduate students shall be allowed maternity leave as per existing Government rules and regulations.

Male post-graduate students shall be allowed paternity leave as per existing Government rules and regulations. In addition to 20 days' paid leave, the candidates will be allowed academic paid leave of 5 days per year. If candidate avails leave in excess of the permitted number of days, his/her term of course shall be extended by the same number of days to complete the training period. However, one shall be able to appear in the examination if one has 80% (eighty per cent) of the attendance.

### **Common Course work**

## **COURSE DURATION: 3 Years (6 Terms of 6 months each) WORK SCHEDULE**

### **Terms:**

#### **I. TERM**

- Search and identify dissertation topic in consultation with guide and collect the relevant literature. Preparation of synopsis and submission of the same to the university for registration.
- Participation in undergraduate teaching programmes
- Journal review meetings
- Seminars
- Experimental pharmacology practical
- Student Symposium/Interdepartmental seminars

#### **II. TERM**

- Journal review meetings
- Seminars
- Participation in undergraduate teaching programmes.
- Experimental pharmacology practical
- Preparation of synopsis for dissertation
- Symposium/Interdepartmental seminars
- Biochemistry/BSRC posting
- Microbiology posting

#### **III. TERM**

- Journal review meetings
- Seminars
- Participation in undergraduate teaching programme
- Clinical postings
- Dissertation experiments
- Experimental pharmacology practical
- Clinical pharmacology practical



- Student Symposium/Interdepartmental seminars
- District Residency Programme

#### **IV. TERM**

- Journal review meetings
- Seminars
- Participation in undergraduate teaching programme
- Clinical postings
- Dissertation experiments
- Dissertation writing
- Test on CNS and chemotherapy
- Clinical pharmacology practical
- Student Symposium/Interdepartmental seminars
- District Residency Programme

#### **V. TERM**

- Dissertation writing and submission to university
- Journal review meetings
- Seminars on selected topics.(Recent advances)
- Participation in undergraduate teaching programme.
- Experimental pharmacology practicals.
- Visit to pharmaceutical industry/SMO
- Clinical pharmacology practical.
- Student Symposium/Interdepartmental seminars
- Test on Endocrinology, Blood and Autacoids
- District Residency Programme

#### **VI. TERM**

- Journal review meetings
- Seminar on selected topics (Recent advances)
- Experimental pharmacology practicals

- Student Symposium/Interdepartmental seminars
- Clinical pharmacology practical

## **ASSESSMENT**

### **Formative Assessment**

During the training, Formative assessment shall be continual and shall assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

Annual Internal Assessment (IA) shall be conducted at the end of each year to assess Theory and Practical skills through OSPE The third annual examination (Preliminary Examination) will be according to the University Summative Assessment format.

In addition, quarterly assessment shall be conducted to cover all domains of learning including professionalism and communication skills. Such assessment shall be used to provide feedback to improve learning.

### **Quarterly Assessment during the MD training programme shall be based on:**

Case presentation, case work up, case handling/management	once a week
Laboratory performance	once a week
Journal club	once a week
Seminar	once a week
Case discussions	once a fortnight/month

Interdepartmental case or seminar	once in 6 months
Attendance at Scientific meetings, CME programmes	at least 01 each in a year

### **e- log book**

During the training period, the postgraduate student shall maintain **an e- log book** indicating the work done in Departmental teaching programmes including Seminars, Journal clubs, Case discussions etc/Laboratory/Research/ Clinical and other postings. In addition, components of good teaching practices shall be assessed for at least two teaching sessions. The log book entries shall be done in real time. **e- log book** shall be used for the formative assessment of the student, that shall be checked and assessed periodically by the faculty members **as per the appraisal form elaborated in Annexure I**. The PGstudents shall be required to produce completed log book in original at the time of final practical examination. It shall be signed by the Head of the Department.

## **SUMMATIVE ASSESSMENT**

The following criteria are mandatory to be eligible to appear for University Examination

### **a)Course in Research Methodology**

All postgraduate students shall complete an online course in Research Methodology. The students shall have to register on the portal of the designated training institutions. The students have to complete the course within one year of the commencement of the course. The online certificate generated on successful completion of the course and examination thereafter, will be acceptable evidence of having completed this course. The above certification shall be a mandatory requirement to be eligible to appear for the final examination of the respective postgraduate course.

**b) Training Course in teaching skills**

Medical Education Unit (MEU)/ Department of Medical education (DOME) shall train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and will be assessed by faculty.

The postgraduate trainees must participate in the teaching and training program of undergraduate students attending the department.

**c) Course in Good Clinical Practice and Good Laboratory Practice**

All postgraduate students shall complete course in Ethics including Good Clinical Practices and Good Laboratory Practices, whichever is applicable to them, to be conducted by Institutes themselves or by any other method. The students have to complete the course within one year of the commencement of the course. No Postgraduate Student shall be permitted to appear in the examination without completing the above course.

**d) Course in Basic Cardiac Life Support Skills (BCLS) and Advanced Cardiac Life Support (ACLS)**

All postgraduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills and get duly certified. The students have to complete the course within one year of the commencement of the course. No Postgraduate Student shall be permitted to appear in the examination without the above certification.

e) PG students shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.

f) The postgraduate trainees must undergo training in information technology and use of computers.

g) Have minimum one Poster presentation or Podium presentation at a National / Zonal / State Conference of his / her specialty.

- h) Have minimum one Research paper published in journal of his / her specialty as first author.
- i) Dissertation acceptance by all evaluators before the conduct of University Examination.

The summative examination would be carried out as per the Rules given in

**POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2023.**

The post-graduate examinations should be conducted in 3 parts:

### **1. Thesis**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

### **2. Theory Examination**

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the four papers for degree examination shall be mandatory.

There should be 4 theory papers:

<b>Paper I</b>	Basic sciences as applied to Pharmacology and General Pharmacology including Toxicology
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<b>Paper II</b>	<b>Systemic &amp; Clinical Pharmacology:</b> Autonomic Nervous System Central Nervous System Peripheral Nervous System Autacoids Cardiovascular System Blood Renal System
<b>Paper III</b>	<b>Systemic &amp; Clinical Pharmacology:</b> Endocrinology Chemotherapy Gastrointestinal System Respiratory System Immunomodulators Miscellaneous
<b>Paper IV</b>	Experimentation, Research, Biostatistics Medical Education and recent advances in Pharmacology

#### 4. Practical and oral examination

Obtaining of 50% marks in Practical examination shall be mandatory for passing the examination as a whole in the said degree examination as the case may be. Hence a candidate shall secure not less than 50% marks in each head of examination which shall include Theory and Practical including Viva voce examination. No grace mark is permitted in Postgraduate Examination either for Theory or for Practical.

Practical examination shall be spread over for two days and Viva should be conducted on 2<sup>nd</sup> day.

#### Practical Examination Exercises:

##### a) Long exercises:

- Perform experiments or simulated experiments (as per PG Regulations)
- Protocol design for a given scenario
- Case audit for a given case

**b) Short exercises:**

- Interpretation of results of a previous tracing - Table exercise
- Demonstration of effects of drugs/interpretation of results in small, animals - optional (as per Regulations notified)

**c) Objective Structured Practical Examination (OSPE) Exercises:**

OSPE shall be conducted for 100 marks and shall include exercises selected from the following:

- Various drug delivery systems
- Calculating pharmacokinetic parameters
- Pharmaceutical calculations
- Statistical exercise
- Pharmacoeconomics
- Critical appraisal of a published paper
- Abstract writing of a published paper
- Evaluation of drug promotional literature.
- Adverse Drug Reaction (ADR) reporting and causality assessment
- Assessment of preclinical toxicity data
- Analysis of rational and irrational formulations
- Selecting a P-drug and writing rational prescriptions
- Analytical instruments - use and interpretation
- Identifying ethics related dilemmas / mistakes in clinical trial documents

**d) Discussion on dissertation:** Candidate shall make a presentation for 8-10 min on the dissertation of topic

**Oral Viva**

- **Grand viva**

### SCHEME OF EXAMINATION

The post-graduate examinations should be conducted in 3 parts:

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

#### A. Theory : 400 Marks

The format of each paper will be same as shown below.

Type of Questions	No. of Questions	Marks for each question	Total marks.
Essay Question	10	10	100
Grand Total			100

**Note: The distribution of chapters/topics shown against the papers are suggestive only and may overlap or change.**

#### B) Practical Examination – 300 marks

	Experiments	Marks
1	Long experiment <ul style="list-style-type: none"><li>• Bio assay using isolated tissue</li><li>• Case discussion</li><li>• Computer Animal Simulator Experiments (CASL)</li><li>• Protocol Writing</li></ul>	60 25 25 30





**C) Viva – Voce Examination: 100 Marks (There shall be 4 tables for each examiner & the marks distributed shall be 25 Marks for each examiner)**

Grand Viva -The Viva-voce would be on all components of all syllabus.	100 marks
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All examiners shall conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It shall include all components of course contents and discussion on dissertation also.

**D) MAXIMUM MARKS**

Maximum marks for M.D. Pharmacology	Theory	Practical	Viva	Grand Total
	400	300	100	800

**VII. RECOMMENDED BOOKS (LATEST EDITIONS):**

<b>Sl.No</b>	<b>Name of the textbook</b>	<b>Authors</b>	<b>Publishers</b>
1	The Pharmacological Basis of Therapeutics	Goodman & Gilman's	Mc Graw Hill
2	Pharmacology	Rang H P & Dale M M	Churchill Livingstone
3	Clinical Pharmacology	Laurence D R, Bennett P N & Brown M J	Churchill Livingstone
4	Basic and Clinical pharmacology	Katzung B G	Mc Graw Hill
5	Lewis's Pharmacology	Crossland J	Churchill Livingstone
6	Fundamentals of Experimental Pharmacology	Ghosh M N	Hilton and company
7	Screening methods in Pharmacology	Turner R A	Academic Press Inc Ltd
8	Evaluation of Drug Activities: Pharmacometrics'' Volume - 1 & 2	Laurence D R & Bacharach A L	Academic Press Inc Ltd
9	Essentials of Medical Pharmacology	K D Tripathi	JAYPEE Brothers Medical

			Publishers Ltd
10	Pharmacology and Pharmacotherapeutics	R S Satoskar Nirmala Rege Raakhi Tripathi Sandhya Kamat	ELSEVIER
11	Lippincott Illustrated Reviews Pharmacology	Sangeeta Sharma and Dinesh K Badyal	Wolters Kluwer

### VIII. RECOMMENDED JOURNALS:

Sl. No.	Name of the Journal
1	Annual Review of Pharmacology and Toxicology
2	Journal of Pharmacology and Experimental Therapeutics (Monthly).
3	Indian Journal of Pharmacology (Bimonthly).
4	Clinical Pharmacology and Therapeutics (Monthly)
5	Journal of Pharmacy and Pharmacology (Monthly).
6	Indian Journal of Experimental Biology (Monthly)
7	Other relevant periodicals available in the library or internet.

Sl. No.	Additional reading
1	Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi.
2	National Health Policy, Ministry of Health & Family Welfare, Nirman Bhawan, New Delhi.
3	Indian Council of Medical Research, "Policy Statement of Ethical considerations involved in Research on Human Subjects, 1982, I.C.M.R, New Delhi.
4	Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.

5	Francis C M, Medical Ethics, J P Publications.
6	Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi.
7	Mahajan B K, Methods in Bio statistics for medical students, 5 <sup>th</sup> Ed.

**Websites:**

1. National Guidelines on national programs e.g.  
<https://cdsco.gov.in/openscms/openscms/en/Home>
2. MOHFW Website <https://www.mohfw.gov.in/>
3. WHO Website <https://www.who.int/>

## JOURNAL REVIEW SHEET

Name of the student:

Name of the faculty:

Sl.No	Parameters to assess	Date				
	Title of the paper:					
	Journal Name:					
	Moderator:					
1	<b>Preparation</b>					
	a) Purpose for choosing					
	b) Identifies learning issues					
	c) Reviews relevant information					
	d) Slides					
2	<b>Presentation</b>					
	a) Clarity					
	b) Confidence					
	c) Use of audio visual aids					
3	<b>Critical appraisal</b>					
4	<b>Ability to respond questions</b>					
5	<b>Overall performance</b>					

<b>TOTAL SCORE</b>					
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Total points: 50

(SCALE= Poor/ satisfactory-1, Average-2, Good- 3, Very Good - 4, Excellent-5)



## SEMINAR EVALUATION SHEET

Name of the student:

Name of the faculty:

Sl.No	Parameters to assess	Date				
	Topic:					
	Moderator:					
1	<b>Preparations</b>					
	a) Depth					
	b) Extent					
	c) Slides					
2	<b>Presentation</b>					
	a) Order					
	b) Clarity					
	c) Use of audio visual aids					
3	<b>Ability to respond questions</b>					
4	<b>Overall performance</b>					
<b>TOTAL SCORE</b>						

Total points: 40

(SCALE= Poor/ satisfactory-1, Average-2, Good- 3, Very Good-4, Excellent-5)

## Annexure 1

**Pre/ Para / Clinical** **Name of the Department / Unit :**

**Name of the PG Student :**

**Period of Training : FROM.....TO.....**

Student appraisal form for MD in Pharmacology											Comments
	Elements	Less than Satisfactory			Satisfactory			More than Satisfactory			
		1	2	3	4	5	6	7	8	9	
1	<b>Scholastic aptitude and learning</b>										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity ( e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned (e.g Poster publications etc.)										
1.4	Documentation of acquisition of competence (e.g. Logbook)										
1.5	Performance in work-based assessments										

1.6	Self-directed Learning										
2	<b>Work related to training</b>										
2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										
2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of training										
3	<b>Professional attributes</b>										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										

3.3	Conduct that is ethically appropriate and respectful at all times										
4	<b>Space for additional comments</b>										
5	<b>Disposition</b>										
	Has this assessment pattern been discussed with the trainee	Yes	No								
	If not explain										
	Name and signature of the assesse										
	Name and signature of the assessor Date:										

## Annexure 2

### Criteria for evaluation of dissertation (Tick whichever is appropriate)

S. No	Criterion	Adequate	Inadequate
1	Title of the study		
2	Research Background & Objectives		
3	Research Methodology utilized in accordance with the objectives		
4	Depiction of results		
5	Discussion		
6	Conclusion		
7	References		

## **POST GRADUATE DEGREE COURSE**

### **M.D IN MICROBIOLOGY**

#### **PREAMBLE:**

The aim of postgraduate education in Microbiology is to impart requisite clinical, diagnostic, teaching and research skills with appropriate attitude and communication competencies required in the field of Medical Microbiology. To fulfill these expectations, with the evolving role of clinical microbiologist and prevailing trends of microbial infections the program of MD Microbiology needs to shift focus to clinical aspects of microbiology, where a student is trained in the clinical setting and is able to contribute in the clinical management along with diagnosis, prevention and control of infectious disease.

The new curriculum guide has given more emphasis on training in patient care setting with integration of concepts of microbiology in various clinical specialties through dedicated postings, ward rounds, case discussion etc. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

#### **I.GOALS:**

The main aim of this course is to train students of Medicine in the field of Medical Microbiology. Theoretical and Practical is given in the sub-specialties viz, Bacteriology, Virology, Parasitology, Immunology and Mycology so that they can participate in good patient care and prevention of infectious diseases in the Community. They are introduced to basic research methodology so that they can conduct fundamental and applied research. They are also trained in teaching methods which should may enable them to take up

teaching assignment in Medical Colleges/Institutions.

## *II. OBJECTIVES:*

A candidate upon successfully qualifying in the MD (Microbiology) examinations, should be able to:

- a. Be a competent Clinical Microbiologist.
- b. Conduct such clinical/experimental research as would have significant bearing on human health and patient care.
- c. Interact with the allied departments by rendering services in advanced laboratory investigations.
- d. Conduct collaborative research in the field of Microbiology and Allied Sciences.
- e. Demonstrate to the students how the knowledge of Microbiology can be used in a variety of clinical settings to solve diagnostic and therapeutic problems.
- f. Undertake teaching assignment of Microbiology in a medical college as per CBME.
- g. Play a Pivotal role in Hospital infection control, including formulation of antibiotic policy and management of Biomedical waste.
- h. Demonstrate ability to plan, execute and evaluate teaching and training assignments efficiently and effectively in Microbiology for undergraduate students as per Competency Based Medical Education (CBME).
- i. . Identify public health epidemiology, global health patterns of infectious diseases and effectively participate in community outreach and public health programs for investigation, prevention and control of infectious diseases.

- j. . Demonstrate self-directed learning skills and keep updated with recent advances in the field of clinical microbiology.

The following specific objective are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the following subheadings.

1. Knowledge
2. Skills
3. Human values, ethical practice and communicationabilities.

## SUBJECT SPECIFIC COMPETENCIES

### A. Cognitive Domain:

At the end of the course, the student should have acquired knowledge in the following theoretical competencies:

#### **General Microbiology(GM) & Immunology(IG)**

##### **General Microbiology(GM):**

1. Understand the contributions of various pioneers in Microbiology.
2. Describe the types, working principles and applications of Compound microscope, Phase contrast microscope, Dark ground, Fluorescent Polarised microscope & Electron Microscope.
3. Identify various morphological forms of bacteria and other micro- organisms.
4. Understand nomenclature and classification of microbes.



5. Describe the physiology of growth, metabolism and nutrition of bacteria.
6. Understand various sterilization methods, disinfection and lyophilization.
7. Describe various mechanisms of virulence in bacteria and understand their clinical applications.
8. Understand the principles and applications of bacterial genetics and gene cloning.
9. Understand and apply various antibacterial substance used in the treatment of infection and drug resistance in bacteria.
10. Learn normal flora of human body, ecology of hospital environment, air, water, food & milk.
11. Discuss/ Describe host parasite relationship
12. Various Bio-safety issues including physical & biological containment, universal containment, personal protective equipment for biological agents.
13. Various isolation precautions including standard and transmission based precautions.
14. Applications of quality assurance, quality control in microbiology and accreditation of laboratories.
15. Explain the concept and use of information technology (LIS, WHO NET etc.) in microbiology laboratory effectively.
16. Describe types and applications of Bacteriophages in diagnostic and therapeutic of infections
17. Explain the principles and application of recent technological advances, automation, and application of Artificial Intelligence, nanotechnology, biosensors, bioinformatics, etc. in diagnosis & research in Microbiology.

### *Immunology (IG)*

1. Describe the anatomy and physiology of innate immunity.
2. Differentiate between innate and acquired immunity.
3. Discuss structure and function of antigen and antibodies.
4. Understand the function of complement in health and disease.
5. Describe various antigen and antibody reactions with their applications in the diagnosis of various diseases.
6. Understand the mechanisms of cellular and humoral immunity.
7. Classify various types of hypersensitivity reactions and describe their role in various diseases.
8. Recognize various immunodeficiency disorders & autoimmune diseases.
9. Describe the mechanisms of immunotolerance and surveillance.
10. Describe various types of transplants and mechanisms in graft versus host reactions.
11. Understand the role of immunity in tumours and describe various tumour antigens / markers.
12. Understand and apply the role of immunoprophylaxis and immunotherapy in various diseases / disorders.
13. Discuss the scope of qualitative / quantitative estimation of various antigen & antibodies in health & disease.
14. Measurement of immunological parameters
15. Mechanisms and significance of immune-potentiation and Immune-modulation
16. Explain the role of animals in immunology.

### **Clinical/Systemic Microbiology-I (CM-I)**

Discuss in depth about the etiological agents, source, transmission, host-parasite interaction, clinical manifestations, laboratory diagnosis, treatment, prevention, epidemiology, national, international guidelines in the situations/ scenario given below:

National and international guidelines in infections caused by below infections.

- Infections of various organs and systems of the human body

Microbiological basis of infective syndromes of various organs and systems of human body viz.

1. CVS and blood,
2. Respiratory Tract Infections,
3. Urinary Tract Infections,
4. Central Nervous System infections,
5. Reproductive Tract Infections, Gastrointestinal Tract infections,
6. Hepatobiliary System,
7. Skin and Soft tissue infections,
8. Musculoskeletal system,
9. infections of Eye, Ear and Nose etc

### **Clinical/Systemic Microbiology-II (CM-II)**

Discuss in depth about the etiological agents, source, transmission, host-parasite interaction, clinical manifestations, laboratory diagnosis, treatment, prevention, epidemiology, national, international guidelines in the situations/ scenario given below:

- Infectious diseases as per the source/risk
- **Opportunistic Infections** in special and high risk host
- Infections in special situations/ scenario.

Microbiological basis of infective syndromes as per the source/risk e.g. Blood borne, sexually transmitted infections congenital, vector borne, food, air & water borne, zoonotic, laboratory acquired, occupational infections etc. Opportunistic Infections in special and high risk host eg Pregnancy, neonates, geriatrics, diabetics, immunocompromised host due to any reason, patients with Implants/Devices, dialysis etc, Infections in special situations/ scenario -Tropical, Travel related, Emerging/ Remerging Infectious diseases seen commonly, agents of bioterrorism etc.

- Elicit relevant history, interpret laboratory results with clinic-

microbiological correlation and develop diagnostic and treatment algorithms.

**Bacteria:**

1. Describe the morphology, cultural characteristics, biochemical reactions, antigenic structure, virulence factors, pathogenicity, laboratory diagnosis epidemiology of the disease caused, preventive and control measures and recent advances in detail of all the pathogenic bacteria.

2. Demonstrate knowledge about epidemiology, morphology, biochemical properties, antigenic nature, pathogenesis, complications, laboratory diagnosis treatment and prevention of major bacterial pathogens of medical importance given below

- a. Gram positive cocci including Staphylococcus, Micrococcus, Streptococcus, Anaerobic Cocci etc.
- b. Gram negative cocci including Neisseria, Branhamella, Moraxella etc.
- c. Gram positive bacilli including Lactobacillus, Coryneform bacteria, Bacillus and aerobic bacilli, Actinomyces, Nocardia, Actinobacillus and other actinomycetales, Erysipelothrix, Listeria, Clostridium and other spore bearing anaerobic bacilli etc.
- d. Gram negative bacilli including Vibrios, Aeromonas, Plesiomonas, Haemophilus, Bordetella, Brucella, Gardnerella, Pseudomonas and other non-fermenters, Pasteurella, Francisella,

Bacteroides, Fusobacterium, Leptotrichia and other anaerobic gram negative bacilli etc.

e. Helicobacter, Campylobacter, Calymmatobacterium, Streptobacillus,

Spirillum and miscellaneous bacteria

f. Enterobacteriaceae

g. Mycobacteria

h. Spirochaetes

i. Chlamydia

j. Mycoplasmatales; Mycoplasma, Ureaplasma, Acholeplasma and other

Mycoplasmas.

k. Rickettsiae, Coxiella, Bartonella etc.

l. Any newly emerging bacteria.

## *Virology*

### *I. Systemic virology*

a. Knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major DNA viruses of medical importance including Pox viruses, Herpes viruses, Adeno viruses, Hepadna virus, Papova viruses and Parvo viruses etc.

b. Knowledge about epidemiology, morphology, genetics,

antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major RNA viruses of medical importance including Entero viruses, Toga viruses, Flavi viruses, Orthomyxo viruses, Paramyxo viruses, Reoviruses, Rhabdo viruses, Arena viruses, Bunya viruses, Retro viruses, Filo viruses, Human Immunodeficiency Virus, Arbo viruses, Corona viruses, Calci viruses etc.

- c. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of major Hepatitis viruses
- d. Demonstrate knowledge about epidemiology, morphology, genetics, antigenic nature, pathogenesis, complications, laboratory diagnosis, treatment and prevention of unclassified viruses and slow viruses including prions
- e. Demonstrate knowledge about any newly emerging virus.

#### *Parasitology*

Describe the geographical distribution, habitat, morphology, life cycle, immunology, pathogenicity, clinical features, complications, laboratory diagnosis, treatment and prophylaxis of all the Protozoan and Helminthic parasites of medical importance including the recent advances in the field of parasitology.

- a. Demonstrate knowledge about epidemiology, morphology, antigenic nature, life cycle, pathogenesis, complications, laboratory diagnosis, treatment and prevention of

Protozoan parasites of medical importance including *Entamoeba* Free living amoebae, *Giardia*, *Trichomonas*, *Leishmania*, *Trypanosoma*, *Plasmodium*, *Toxoplasma*, *Sarcocystis*, *Cryptosporidium*, *Microsporidium*, *Cyclospora* *Isospora*, *Babesia*, *Balantidium*, etc.

- b. Demonstrate knowledge about epidemiology, morphology, antigenic nature, life cycle, pathogenesis, complications, laboratory diagnosis, treatment and prevention of helminthes of medical importance including those belonging to Cestoda (*Diphyllobothrium*, *Taenia*, *Echinococcus*, *Hymenolepis*, *Dipylidium*, *Multiceps* etc.), Trematoda (*Schistosomes*, *Fasciola*, *Fasciolopsis*, *Gastrodiscoides*, *Paragonimus*, *Clonorchis*, *Opisthorchis* etc.) and Nematoda (*Trichiuris*, *Trichinella*, *Strongyloides*, *Ancylostoma*, *Necator*, *Ascaris* *Toxocara*, *Enterobius*, *Filarial worms*, *Dracunculus* etc. )
- c. Demonstrate knowledge about common arthropods and other vectors viz. mosquito, sand fly, ticks, mite, cyclops, louse, myasis of medical importance.

b. Neglected tropical parasitic diseases

c. Any newly emerging parasite

## *Mycology*

Describe the structure, classification, morphology, reproduction, pathogenesis, clinical features, laboratory diagnosis and epidemiology of all the fungi of medical importance including the recent advances in the field of mycology.

d. Demonstrate knowledge about epidemiology, morphology, biochemical properties, antigenic nature, pathogenesis, complications, laboratory diagnosis

treatment and prevention of major fungal pathogens of medical importance given below.

- i. Yeasts and yeast like fungi including *Candida*, *Cryptococcus*, *Malassezia*, *Trichosporon*, *Geotrichum*, *Saccharomyces* etc.
- ii. Mycelial fungi including *Aspergillus*, *Zygomycetes*, *Pseudallescheria*, *Fusarium*, *Piedra*, other dematiaceous hyphomycetes and other hyalohyphomycetes etc.
- iii. Dimorphic fungi including *Histoplasma*, *Blastomyces*, *Coccidioides*, *Paracoccidioides*, *Sporothrix*, *Penicillium marneffei* etc.
- iv. Dermatophytes
- v. Fungi causing Mycetoma, Chromoblastomycosis, Occulomycosis and Otomycosis.
- vi. *Pneumocystis jirovecii* infection



vii. *Rhinosporidium seeberi* and *Lacazia loboi* (formerly named *Loboa loboi*)

viii. *Pythium insidiosum*

ix. *Prototheca*

e. Able to identify laboratory contaminant fungi

f. Explain Mycetism and mycotoxicosis along with agents involved

Any newly emerging fungi

Applied Microbiology(AM)& Recent advances:

a. Demonstrate knowledge about epidemiology of infectious diseases

b. Demonstrate knowledge about antimicrobial prophylaxis and therapy

c. Demonstrate knowledge about hospital acquired infections

d. Demonstrate knowledge about management of biomedical waste

e. Effectively investigate an infectious outbreak in hospital and community

f. Demonstrate knowledge about infections of various organs and systems of human body viz. respiratory tract infections, urinary tract infections, central nervous system infections, congenital infections, reproductive tract infections,

gastrointestinal infections, hepatitis, pyrexia of unknown origin, infections of

eye, ear and nose, septicaemia, endocarditis, haemorrhagic fever etc.

- g. Demonstrate knowledge about opportunistic infections
- h. Demonstrate knowledge about various sexually transmitted diseases
- i. Demonstrate knowledge about principles, methods of preparation, administration and types of vaccines
- j. Effectively use information technology (Computers) in microbiology
- k. Demonstrate knowledge and applications of Automation in Microbiology
- l. Demonstrate knowledge and applications about molecular techniques in the laboratory diagnosis of infectious diseases
- m. Demonstrate knowledge in statistical analysis of microbiological data and research methodology
- n. Demonstrate knowledge in animal and human ethics involved in microbiology
- o. Demonstrate knowledge in safety in laboratory and Laboratory management
- p. **Role of microbes in non-communicable diseases** - infectious agents in origin and progression of non-communicable diseases like cancer, diabetes, musculoskeletal disorder and influence of these microbes on mental health.

**B. Affective Domain:**

- a. Adopt ethical principles in all aspects of his/her practice; professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.

- b. Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- c. Provide leadership and get the best out of his team in a congenial working atmosphere.
- d. Apply high moral and ethical standard while carrying out human or animal research.
- e. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- f. Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.
- g. Communicate effectively with peers, and consultants for better clinical correlation of laboratory findings as well as research.
- h. Demonstrate effective communication and attitudinal skill while teaching undergraduate students.
- i. Demonstrate altruistic professional behavior with respect, discipline, responsibility, accountability, punctuality and integrity at all times while dealing with patients and their relatives.

### **C. Psychomotor domain:(skills)**

**C1 :The postgraduate student should be able to \*perform the following and/or interpret the results independently or as a part of a team\*:**

#### **Laboratory skills:**

- a. Collect, transport and store appropriate specimens for microbiological investigations.
- b. Receive and process clinical specimens after appropriate preparation of samples for the appropriate investigation (centrifugation, extraction, mincing concentration etc.)
- c. Processing of samples by various methods like:
  - i. Macroscopic/gross examination of samples.
  - ii. Choose the most appropriate microscopic method for demonstration of pathogens.
  - iii. Prepare, examine, and demonstrate microbes in direct smears for diagnosis of infectious disease/s.
  - iv. Isolate and identify pathogenic microbe from clinical specimens (by conventional & automated methods).
  - v. Perform, interpret & record antimicrobial susceptibility testing of the isolate.
  - vi. Perform rapid, conventional and automated serological techniques for diagnosis of infectious diseases and immunological diseases.
- d. Maintain records and ensure quality control in microbiology.

- e. Maintain and preserve microbial cultures.
- f. Operate and maintain instruments used in the laboratory for sterilization and disinfection and patient care with quality control.
- g. Operate and maintain common laboratory equipment like microscopes, water bath, centrifuge, incubator, automated culture system, micro-centrifuge, ELISA washer and reader etc.
- h. Perform and assess significance of microbial contamination of food, water and air.
- i. Biosafety measures - biosafety cabinets, chemical material safety data sheet (MSDS), fire safety, needle stick injury management.

**Organisms (Bacteria, Fungi, Virus and Parasites) based Laboratory skills:**

- **Direct microscopic methods for demonstration of infectious agents:**
  - a. Wet mount examination for - looking for cells and organisms (bacteria, fungi, parasite)
    - i. Saline mount stool sample - parasitic morphology
    - ii. Iodine mount-parasitic morphology
    - iii. KOH for fungi
    - iv. Negative staining
  - b. Staining methods
    - i. Preparation of stains & quality check
    - ii. Preparation of peripheral blood smears from various samples
    - iii. Staining techniques - simple, differential, special staining methods - capsule, spore, flagella etc.
    - iv. Gram Staining
    - v. Acid Fast staining (with modifications).
    - vi. Leishman & Giemsa for demonstration of intracellular pathogen bacteria, parasite, fungi etc.
    - vii. Albert staining.
  - c. Fluorescent staining
    - i. Auramine staining - Mycobacterium tuberculosis.

- ii. QBC – for malaria.
  - iii. Calcoflor white staining for fungus
- d. Isolation of pathogens
  - i. Preparation of glass wares
  - ii. Sterilization procedures
  - iii. Media preparation-required for isolation & identification
  - iv. Quality check of all media - functional as well as sterility check and maintenance of the record
  - v. Inoculation methods of various samples – surface, streak, stab etc depending on sample
  - vi. Incubation methods - aerobic, anaerobic, microaerophilic, capnophilic depending on the pathogens.
- e. Identification of pathogen
  - i. Colony characters – various characters to be noted in different media.
  - ii. Staining to identify – Gram's / Alberts / Acid Fast/ Lactophenol cotton blue depending on pathogen.
  - iii. Motility by hanging drop preparation and other methods.
  - iv. Biochemical reactions - phenotypic-enzymatic, oxidative fermentative, sugar fermentation, other special tests helping to identify up to species level.
  - v. Serotyping.
- f. Antibiotic Susceptibility Testing
  - i. Selection of antibiotic disks as per CLSI/EUCAST based on the probable identification of organism - bacteria, fungi.
  - ii. Detection of drug resistant strains - MRSA, VISA, VRE, ESBL, MBL, CRE etc.
  - iii. Broth microdilution methods for bacteria and fungi.
- **Immunological tests**
  - i. i. Collection, preparation and storage of samples
  - ii. ii. Perform Rapid tests / /Latex agglutination/ ICT/ELISA etc

- **Molecular tests**
  - i. PCR/RTPCR – all steps till interpretation
  - ii. CBNAAT
- **Biomedical waste management skills.**
- **Quality control skills in all areas.**

#### **Clinical Microbiology Skills (Infectious Disease Case Based Skill)**

- i. Demonstrate ability to take and interpret the history of infectious disease case.
- ii. Be able to clinically examine the case and diagnose.
- iii. Take decision for choice of samples to be collected for diagnosis
- iv. Suggest optimum choice of antimicrobial agent to be prescribed with reasons.

#### **Infection Prevention and Control Skills-**

- i. Hand hygiene skills
- ii. Donning and doffing of PPE
- iii. Transmission based precautions in patient care
- iv. Segregation and disposal of biomedical waste in laboratory and hospital
- v. Handling of sharps
- vi. Post-exposure prophylaxis when exposed to blood and body fluids
- vii. Spillage management
- viii. Sterilization policy of environment and devices in the hospital as per the latest guidelines.
- ix. Calculation of HAI infection rates.
- x. Plan & conduct HAI surveillance & infection control audits

#### **C 2. Should be able to perform under supervision and/or interpret the results of the following desirable procedures independently or as a part of a team:**

- 1. Demonstration of microbe by:
  - i. IF – autoimmune diseases
  - ii. IF – antigen demonstration in fungi/viral infection /cellular changes

2. Isolation & Identification using newer automated systems for bacterial identification, Mycobacterial culture and Mycobacterial susceptibility
3. Immunological test
  - i. Nephelometry/ turbidometry method for quantitative CRP/ASO/RA test
  - ii. Chemi-Luminiscence Immuno Assay
4. Perform molecular & newer diagnostic tests for diagnosis of infectious disease.

**C 3. Should observe the following procedures independently or as a part of a team and/or interpret the results of: (optional)**

1. Demonstration of microbes by Electron microscope
2. Viral culture & identification of growth of viruses
3. Immunological test
  - iii. Quantiferon
  - iv. Flowcytometry
4. Molecular -
  - i. Genome Sequencing methods
  - ii. Molecular typing.

## **TEACHING AND LEARNING ACTIVITIES**

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a logbook for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

### **Teaching-Learning methods**

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation- based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative



activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used.

#### **A. Theoretical Teaching:**

##### **1. Lectures:**

Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated there should be a minimum of 10 lectures per year

##### **2. Journal Club:**

Journal clubs are held Min of once in 1-2weeks is suggested. All the PG students are expected to attend and actively participate in the discussion and enter in the log book relevant details. The presentations are evaluated using check list and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator is announced well in advance.

##### **3. Subject Seminar:**

Seminars shall be conducted min of once every 1-2 weeks is suggested on the theory question topic. All the PG students are expected to attend and actively participate in the discussion and enter in the log book relevant details. The presentations are evaluated using check list and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator is announced well in advance. The student should be graded by faculty and peers.

#### **4. Teaching Skills:**

Post Graduate students teach undergraduate students (eg. Medical, BDS, Nursing, BPT, Allied Courses) by taking demonstrations and lectures. Assessment is made using checklist by medical faculty as well as by the students. Record of their participation is to be kept in log book. Training of Post Graduate students in educational science and technology is recommended. **Training by medical education unit.**

#### **5. Student Symposium: Minimum of once every 3 months.**

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers.

#### **6. Laboratory work / Bedside clinics: Minimum- once every 1-2 weeks.**

Laboratory work/Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department where a student is posted shall moderate the teaching-learning sessions during clinical rounds.

#### **7. Interdepartmental colloquium/scientific society meetings:**

Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases.

#### **8. Continuing Medical Education Programmes (CME):**

All Post Graduate students should attend at least 1 state CME programmes.

#### **9. Conferences:**

Attending conference is compulsory. Post-graduate student should attend one national and one state level conference during the course.

#### **10. Research Activities:**

The Post-graduate students are encouraged to carry out research activities in the department other than dissertation work.

#### **11. Culture seminars and discussions:**

Culture seminars and discussions are held once a week. Which helps in systematic way of identification of all the routine bacteria for first few months followed by identification of rare cultures.

#### **12. Clinical Case/Bed side clinics:**

Clinical case seminars are held once a month by processing the clinical samples for isolation and identification of the microbes causing that condition.

**Following is the plan of Rotation for Postgraduate students Postings to Diagnostic Laboratories/Hospital/ Community-**

<b>Sr no</b>	<b>Schedule of Rotation</b>	<b>Duration</b>	<b>Specific Learning Objectives</b>
<b>1</b>	<p>Microbiology laboratory</p> <ol style="list-style-type: none"> <li>Different sectionsof Bacteriology</li> <li>Media preparati on</li> <li>Mycobacteriolog y</li> <li>Serology/Immu nology</li> <li>Mycology</li> <li>Virology</li> <li>Parasitology</li> <li>Molecular lab</li> </ol> <p>Hospital InfectionControl includingBMW management</p>	Distributed in varioussection depending upon training& departmental needs	As per the specific objectives in each section, a student is expected to acquire skills from basic to the most recent ones in diagnostic microbiology*.
<b>2</b>	Sample Collection area	<b>Two weeks</b>	<p>To learn pre-analytical parameters &amp; procedures at sample collectionarea.</p> <ul style="list-style-type: none"> <li>To communicate effectively with patients at sample collection area.</li> <li>Learn to demonstrate respect, empathy &amp; confidentiality when dealing with patients, samples and reports.</li> </ul> <p>Demonstrate leadership skills in managingthe functioning of the lab (staff management, preparing duty roster )</p>

3	<p>Clinical Pathology</p> <p>i. Hematology</p> <p>ii. Histopathology</p> <p>Blood Bank</p>	Two weeks	<ul style="list-style-type: none"> <li>• Basic knowledge of clinical pathology (as applied to Microbiology)</li> <li>• Inflammation and repair</li> <li>• Intercellular substances and reaction</li> <li>• Pathological changes in the body in bacterial, viral, mycotic and parasitic infections</li> </ul> <p><b>Clinical Pathology skills:</b></p> <ul style="list-style-type: none"> <li>• Peripheral smear examination</li> <li>• CBC interpretation</li> <li>• Urine examination</li> </ul> <p>Pathological investigations and their significance in infectious disease diagnosis.</p> <p><b>Blood Bank skills:</b></p> <ul style="list-style-type: none"> <li>• Transfusion transmitted infection Blood grouping</li> <li>• Screening of blood &amp; blood donors</li> <li>• Counseling skills</li> </ul> <p><b>Histopathology skills:</b></p> <ul style="list-style-type: none"> <li>• Various stains and staining techniques used in histopathological examination of infectious agents</li> </ul> <p>Identification of pathogen and/or pathological changes in tissue sections in infectious diseases.</p>
4.	Clinical Biochemistry	One week	<ul style="list-style-type: none"> <li>• Basic understanding of biochemistry as applied to immunological/ molecular</li> </ul>

			<p>methods for study of microbial diseases and pathogenesis of infections.</p> <p>Significance of biochemical markers/profile in diagnosis, prognosis and monitoring of infective syndromes like sepsis</p>
<b>5</b>	ICTC /PPTCT/ART	<b>Two weeks</b>	<ul style="list-style-type: none"> <li>• HIV counseling skills</li> <li>• HIV Testing strategies</li> <li>• HIV Surveillance strategies</li> <li>• Treatment regimens in HIV positive</li> <li>• case, management of drug resistance, and prophylaxis PEP, prevention &amp; management of opportunistic infection</li> </ul>
<b>6</b>	Tuberculosis and RNTCP	<b>Two weeks</b>	<ul style="list-style-type: none"> <li>• Diagnosis of Pulmonary and extrapulmonary TB</li> <li>• Fluorescent Microscopy for TB</li> <li>• Molecular diagnosis</li> <li>• National tuberculosis Elimination Program</li> <li>• Treatment regimens in susceptible and drug resistant TB cases</li> </ul>
<b>7</b>	District hospital postings (mandatory) 3rd or 4th semester for 3 months*	<b>Three months*</b>	<ul style="list-style-type: none"> <li>• Identify types of infections seen in community</li> <li>• Identify lacuna in KAP in community that promote development of infections</li> <li>• Choice of antimicrobials and treatment plan for infections in community</li> <li>• Infection control in community</li> </ul>

			<ul style="list-style-type: none"> <li>• Should contribute to strengthen the services of the district health system, the diagnostic laboratory services.</li> <li>• Participate in public health programs &amp; research activities</li> </ul>
<b>8</b>	<b>Clinical locations –</b>  i. Medicine & allied (General Medicine, Respiratory Disease, Skin & Venereal Disease)  ii. Pediatrics  iii. Surgery & allied (General Surgery, Orthopedic)  Obstetric and Gynecology	<b>Two months</b>  Posting to be done for morning half of the day	<b>Depending on the area of posting-</b> <ul style="list-style-type: none"> <li>• History taking and physical examination skills</li> <li>• Sample collection and transportation skills</li> <li>• Identification of common infections and make a differential diagnosis</li> <li>• Choose the appropriate laboratory investigations required for confirmation of diagnosis</li> <li>• Interpret the laboratory results and correlate them clinically.</li> <li>• Learn common treatment plan, particularly choice of antimicrobials and identify factors that influence choice of antimicrobials.</li> <li>• Acquire reasoning and critical thinking required in decision making when dealing with an infectious disease case</li> <li>• Infection control practices</li> </ul>
<b>9</b>	<b>Critical care units-</b>  i. Medical ICU	<b>Three weeks</b>  (in morning half	<ul style="list-style-type: none"> <li>• All above in a critical setting along with Availability and choice of specialized</li> </ul>

	ii. Surgical ICU Neonatal/Pediatric ICU	day)	investigations necessary for optimum management of a critical patient with ID. Significance and adherence to antibiotic policy and antibiotic stewardship program Infection control in ICU
<b>10</b>	Institutional Super specialty wing if available Dialysis, Oncology, Cardiology etc	<b>One week</b>  ( morninghalf day)	<ul style="list-style-type: none"> <li>To study infections seen in special situations along with their management &amp; prevention approach</li> </ul>
	<b>Total duration of posting outside microbiology laboratory</b>	<b>33 weeks</b>	

**\*Posting under “District Residency Programme”**

Depending upon the objectives to be achieved, feasibility and availability of resources, the rotational postings can be within the hospital or outside the hospital.

During the clinical posting, opportunities to present and discuss infectious disease cases through bedside discussion and ward/grand rounds with clinicians in different hospital setting must be scheduled.

The PG student must be tagged along with the resident of the clinical department for bedside case discussion, under the guidance of an assigned faculty. A minimum of five case histories shall be recorded by a student during course of study. The case history must be representative of different type of Infectious Disease (ID) cases likely to be encountered eg., those caused by different microbes in community and hospital setting, HAI, infections in critical care/ ward



setting, infection in different age groups, infections in special host like Immunocompromised host, traveler, specific occupations etc.

The process of recording case histories can begin in first half of 2<sup>nd</sup> year of PG program, after students have learnt about various infective syndromes. The severity and complexity of cases must progress gradually, with simple community-based infection to begin with. At least one fourth of the cases recorded must have been discussed with the ID specialist or a clinician and their feedback/remarks documented in log book/ portfolio with their signatures.

Documentation of students learning at the end of each posting is required.

### **Emergency duty**

The student is posted for managing emergency laboratory services in Microbiology.

He/she should deal with all the emergency investigations in Microbiology.

### **13 A. Rotational clinical /community/institutional Postings.(as per table)**

Depending on local institutional policy and the subject specialty needs, postgraduate trainees may be posted in relevant departments/ units/ institutions. The aim would be to acquire more in- depth knowledge as applicable to the concerned specialty. Postings would be rotated between various units/departments and details to be included in the specialty-based Guidelines.

The period of such assignments/ postings is recommended for **33 weeks**. Posting schedules may be modified depending on needs, feasibility and exigencies. For facilities not available in the parent institution as well as for additional knowledge and skill, extramural postings may be undertaken.

**Suggested specific learning objectives are to be added in the log book.** Each candidate is posted to different sections on rotation.

The three-year training programme in microbiology is arranged in the form of rotational postings to different sections/laboratories/departments/disciplines for specified periods.

Student must be posted for various duration in different sections of Microbiology (like Bacteriology, Serology, Virology, Parasitology, Immunology, Mycobacteriology, Mycology and Hospital infection control), patientcare areas in hospital (like emergency, OPDs, critical care areas, surgical and medical wards etc) as well as in community outreach programs, so that they can learn specific requirements of each section and participate in patient care and prevention of infectious diseases in the hospital as well as community.

### 13 B Posting under “District Residency Programme” (DRP):

The Primary goals of the DRP are :

1. To expose the postgraduate residents to the district Health System (DHS) and involve them in all levels of health care services.
  2. To acquaint residents with the planning. Implementation, monitoring and assessment of outcomes of National Health Programmes.
  3. To orient the resident to promotive, preventive, curative and rehabilitative services being provided by various other categories of healthcare professionals under the umbrella of the National Health Mission.
- A Secondary goal of the programme is also to reinforce medical manpower at the DHS levels and expand the range and quality of services currently provided therein.

All Postgraduates have to mandatorily undergo the DRP training for three (03) months and complete it satisfactorily, to be eligible to appear in the final examination.

### 14. Dissertation:

Every candidate pursuing MD degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. If a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work to re-inforce the Diversity of knowledge and skills.

### 15. Training in teaching & learning skills

MEU/DOME would train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

### 16. E-Log book

During the training period, the postgraduate student should maintain a E-Log Book indicating the duration of the postings/work done in different posting in the Department of Microbiology and in clinical postings. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre-determined activities, and (5) acquisition of selected competencies.

The E-log book is to:

- a) Help maintain a record of the work done during training.

- b) Enable Faculty/Consultants to have direct information about the work done and intervene, if necessary.
- c) Provide feedback and assess the progress of learning with experience gained periodically.

The E-Log Book will be used in the internal assessment of the student, will be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed E-log book at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

The PG students shall be trained to reflect and record their reflections in E-logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program.

**17. Course in Research Methodology:** All postgraduate students shall complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

## Assesment

Candidate will be allowed to appear for examination only if attendance (minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

### 1. Formative Assesment

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. professionalism and communication skills (At least five clinical cases shall be assessed through discussion of case histories recorded by the students while posted in clinical setting and recorded along with feedback (preferably by ID specialist if available/clinician).

The students are assessed periodically as per categories listed in postgraduate student appraisal form (Annexure II).

#### 4. SUMMATIVE ASSESSMENT:

The post-graduate examinations is conducted in three parts:

##### **Essential pre-requisites for appearing for examination include:**

1. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.
2. At least **one minimum of one poster presentation or podium presentation** at national/Zonal/state conference of his / her speciality.
3. Minimum of One research paper should be published in an indexed journal **as first author.**
4. **Completion of online course in research methodology (NPTEL) in first year and submit the completion certificate.**
5. **Completion of certificate course in ethics including good laboratory practices in the first year.**
6. **Completion of certificate course in basic cardiac life support (BCLS) and advanced cardiac life support (ACLS) skills in the first year.**

#### 1. Thesis.

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical /

Practical examination. The thesis shall be examined by a minimum of three

examiners; A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

## 2. Theory Examination:

**Attendance:** 80% of the total working days of the course.

‘Theory’ as well as ‘Practical’ separately **50%** is mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3<sup>rd</sup> academic year. Candidate will be allowed to appear for examination only if attendance (minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

### Theory: 400Marks

There shall be four question papers, each of three hours’ duration. Total marks of each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

Type of Questions	No. of Questions	Marks for each question	Total marks
Essay	10	10	100
Grand total			100

Description	M.D/M.S.
<b>THEORY</b>	
• No. of Theory papers	04
• Marks for each Theory paper	100
<b>Total marks for Theory papers</b> 21	<b>400</b>
Passing minimum for Theory	200/400 (40% minimum in each paper and an aggregate of 50% in theory to be declared pass in theory)
<b>PRACTICALS</b>	300

• Dissertation	20
• OSPE	25 (5 stations x 5 marks)
• Subject specific assessment	255
<b>VIVA</b>	100
• Criteria for passing	A candidate in a subject has to score theory and practical + viva separately with a minimum of 50% marks.
• Criteria for passing	A candidate in a subject has to score theory and practical + viva separately with a minimum of 50% marks.

Details of distribution of topics for each paper will be as follows:

**Paper I- General Microbiology and Immunology (GM & IG).**

**Paper II– Clinical / Systemic Microbiology (CM I).**

**Paper III– Clinical / Systemic Microbiology (CM II).**

**Paper IV- Recent Advances & Applied Microbiology (AM).**

**Note:** The distribution of chapters/topics shown against the papers are suggestive only and may overlap or change.

### 3. Practical and Oral / Viva voce Examination: 400 Marks.

Practical should be spread over TWO days and include the following components:

To elicit competence in practical skills and to discuss differential diagnostic followed by therapeutic aspects.

Sl. No.	Exercise	Marks
1	Bacteriology	80
2	Slide review	30
3	Mycology	30
4	Serology	20
5	Clinical Microbiology	30
6	Virology	25
7	OSPE*	25
8	Parasitology	20
9	Dissertation	20

10	Pedagogy	20
<b>Total</b>		<b>300</b>

<b>Ex. No</b>	<b>Day -1</b>	<b>Ex. No</b>	<b>Day-2</b>
<b>1</b>	Clinical Microbiology exercise (Give a real clinical case /paper based scenario addressing commonly seen cases in bacteriology/mycobacteriology/virology/mycology/parasitology/HAI/AMR/out break /national project based etc of infectious diseases to the PG for workup and evaluation with respect to case history, basic physical examination, required investigations, interpretation of diagnostic test results, and therapeutic management decisions including prescription of antibiotics,, along with IC practices )	<b>1 cont</b>	Clinical Microbiology exercise - Conclusion
<b>2</b>	Long Exercise- Bacteriology (Mixed culture given with a clinical history representing any specimen collected from respective systemic infection )	<b>2 cont</b>	Long Exercise - Bacteriology conclusion
<b>3</b>	Short Exercise – Bacteriology (Identification of a pure culture)	<b>3 cont</b>	Short Exercise - Bacteriology conclusion
<b>4</b>	Serology Exercise (In a clinical case, choice of test & technique with interpretation of test results)	<b>4 cont</b>	Serology cont. if required
<b>5</b>	Virology techniques (In a clinical case, choice of test & technique with interpretation of test results. Viral serology/ Molecular techniques depending upon availability)	<b>5 cont</b>	Virology cont. if required
<b>6</b>	Mycology (Identification of fungi in a clinical case)	<b>6 cont</b>	Mycology cont. if required
<b>7</b>	Parasitology (In a clinical case, choice of test & technique with interpretation of test results Stool examination, Examination of Peripheral blood smear etc)	<b>10</b>	Dissertation <sup>£</sup> , (10-15minutes)
<b>8</b>	Slides (Slides including histopathology for microscopic identification & discussion	<b>11</b>	Pedagogy ( Candidate is asked to make a presentation for 8 – 10 minutes on a topic given in the beginning of practical examination for UG teaching.)

<b>9</b>	<b>OSPE: * OSPE will have 2 performance stations, 3 interpretation with 5 marks each station.</b>	<b>12</b>	<b>Grand viva</b>
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**£ Dissertation will be evaluated by external members only.**

*Viva-voce - Marks: 100*

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. Student shall also be given case reports, charts for interpretation. on Bacteriology, Mycology, Virology, Immunology, and Parasitology topics, it will also include recent advances, history and scope of Microbiology.

*A. Maximum Marks:*

<b>Maximum marks for M.D.</b>	<b>Theory</b>	<b>Practical</b>	<b>Viva</b>	<b>Grand Total</b>
<b>Microbiology</b>	400	300	100	800

The University shall conduct not more than two examinations in a year for any subject, with an interval not less than 4 months and not more than 8 months between the two examinations.

### **I. RECOMMENDED BOOKS (REFER LATEST EDITIONS):**

<b>Sl.No.</b>	<b>Name of the Textbook</b>	<b>Authors</b>	<b>Publishers</b>
1	Medical Microbiology, 3rd Edn, 1991.	Samuel Baron	Churchill Livingstone Inc.
2	Laboratory Diagnosis of Viral Infections, 3rd Edn, 1999	Edmin H Lennette	Newyork Marcel Dekker, Inc.
3	Manson's Tropical Diseases, 22th Edn, 1999. Manson's Tropical Diseases, 24th Edn, 2024	Gordon Cook Farror	London, ELBS.
4	Bergey's Manual of Determinative Bacteriology, 9th Edn, 1994.	John G Holt et al	Maryland, Williams & Wilkins.
5	Manual of Clinical Microbiology, 5th Edn, 1991.  22	Albert Balows	Washington D.C, American Society for Microbiology.
6	Bailey & Scott's Diagnostic Microbiology, 15th Edn, 2022	Ellen Jo Baron et al	Missouri, Mosby.



7	Clinical Virology, 4th Edn 2017	Douglas D. Richman	Newyork, Churchill Livingstone.
8	Burrows Textbook of Microbiology, 22nd Edn, 1985.	Bob A Freeman	W.B. Saunders.
9	Anaerobes in Human Disease, 1991.	Brian I Suerden & B. S. Drasar	Great Britain, Edward Arnold.
10	Introduction to Diagnostic Microbiology, 7th Ed. Colour Atlas and Textbook of Diagnostic Microbiology. 2017.	Elmer W Koneman et al	Philadelphia, J.B. Lippincott Company.
11	Field Virology, Vol. 1 & 2, 3rd Edn, 1996.	Bernard N Fields et al	Philadelphia, Lippincott-Ramen.
12	Medical Microbiology, A guide to Microbial Infections, Pathogenesis, Immunity, Laboratory Diagnosis and Control, 15th Edn, 2000.	Danial Greenwood et al	London, Churchill Livingstone.
13	Mackie & McCartney Practical Medical Microbiology, 14th Edn, 1996.	J.G. College et al	London, Churchill Livingstone.
14	Hospital Infections, 5th Edn, 2007	John V Bennett & Philip S Brachman	Little Brown.
15	Fundamental Immunology, 7th Edn, 2013.	William E Paul	Newyork, Raven Press.
16	Medical Immunology, 9th Edn, 1997. or Medical Immunology, 07th Edn, 2020.	Stites D. P. Terr AI, Parslow T.G. VirellaG	Appleton & Lange, USA
17	Cellular and Molecular Immunology, 10th Edn, 2022.	Abbas A.K., Lichtman Att	Saunders.
18	Manual of Clinical Laboratory Immunology, 4th Edn, 1992.	Rose N.R., Macario EC	American Society for Microbiology.
19	Essential Immunology, 13th Edn, 2017.	Roitt IM, Delves PJ, Roitts	Blackwell Scientific Publisher.
20	Microbiology and Microbial infections, 10th Edn, 2006.	Topley & Wilson's	Arnold.
21	Parasitology(Protozoology&Helminthology) 13 ed, 2019	K D Chatterjee	CBS
22	Diagnostic Medical Parasitology, 6th ed2	Lynne shorre Garcia	ASM Press
23	Textbook of Medical Mycology,4 th ed	Jagadish Chander	Jaypee Brothers Medical Publishers

24	Clinical Mycology, 2nd ed	Michael A Pfaller	Churchill Livingstone
25	Medically Important Fungi, 6th ed	Larones	ASM Press
26	Medical Microbiology, 9th ed, 2020	Patrik R Murray	ELSEVIER
27	Jawetz And Melnick And Adelbergs, Medical Microbiology. 28 Ed, 2019	Riedel.S.; Morse.S. A.	McGraw Hill / Medical

## VIII RECOMMENDED JOURNALS:

Sl.No.	Name of the Journal
1	Journal of Medical Microbiology. 2008. Lippincott-Raven Publishers, Pathological Society of Great Britain & Ireland,
2	Clinical Infectious Diseases. 2008. Pub : The University of Chicago Press, Chicago Illinois 60637,
3	Clinical Microbiology Reviews. Pub : The American Society for Microbiology.
4	Microbiology & Molecular Biology Reviews. (mmbr). 2008. Pub : American Society for Microbiology,
5	Journal of Clinical Microbiology (JCM). 2008. Pub : American Society for Microbiology,

6	The Journal of Infectious Diseases. 2008. Pub : The University of Chicago Press,
7	Journal of Communicable Diseases. 2008. Pub : The Indian Society for Malaria and other communicable disease.
8	Infectious Disease Clinics of North America. 2008. Pub : W.B. Saunde Company, A Division of Harcourt Brace & Company,
9	Indian Journal of Medical Microbiology, 2008. Pub : Indian Associates of Medical Microbiologists,
10	The Indian Journal of Medical Research. 2008. Pub : Indian Council of Medical Research, New Delhi.
11	Annual Review of Microbiology, 2008. Pub : Annual Reviews Inc. Palo Alto. California, USA.

#### ADDITIONAL READING:

Sl.No.	Name of the Textbook	Authors	Publishers
1	* Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985		Central Bureau of Health Intelligence, Directorate General of Health Services, min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi. P – 335.
2	*National Health Policy, Min. of Health & Family Welfare,		Nirman Bhawan, New Delhi, 1983.
3	The elements of Research, writing and editing 1994,	Santosh Kumar.	Dept. of Urology, JIPMER, Pondicherry.
4	Medical Education Principles and Practice, 1995.	Srinivasa D K et.al.	National Teacher Training Centre, JIPMER, Pondicherry.
5	*Indian Council of Medical Research, — Policy Statement of Ethical considerations involved in Research on Human Subjects, 1982		I.C.M.R, New Delhi.

6	*Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956.		Medical Council of India, Kotla Road, New Delhi.
7	Francis C M, Medical Ethics, 1993.		J P Publications, Bangalore.
8	*Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, 1994.		New Delhi,
9	Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med 1991; 424-8		
10	Essentials of Medical Statistics , 1 <sup>st</sup> Ed., 1988.	Kirkwood B R.	Oxford : Blackwell Scientific Publications
11	Methods in Bio statistics for medical students. 6 <sup>th</sup> Ed. 1989.	Mahanjan B.K.	New Delhi, Jaypee Brothers Medical Publishers.
12	A Practical approach to PG dissertation.	Raveendran B. Gitanjali	New Delhi, J P Publications, 1998.

## **Annexure I:**

**Following are the competencies to be achieved under Antimicrobial Resistance Detection and Prevention:**

1. Demonstrate in depth knowledge of classification, mechanism of action and drug resistance of antimicrobials (antibacterials, antiviral, antifungal, antimycobacterial and antiparasitic agents).
2. Explain various phenotypic and genotypic methods used in laboratory for detection of drug resistant strains and their implications in patient care.
3. Demonstrate skills in performing antimicrobial susceptibility testing with calculations of MIC/MBC by various phenotypic and genotypic methods and interpret results as per standard guidelines (CLSI, EUCAST etc).
4. Detect and report bacterial drug resistance by identification of the commonly isolated drug resistant strains (MRSA, VRSA, VRE, CRE, MBL, AMP-C etc) and choose the most appropriate agent for therapeutic use in a specific clinical scenario.
5. Explain the implications of AST result on antimicrobial therapy to clinicians/colleagues.
6. Communicate effectively with clinicians to guide and create an antimicrobial treatment plan based on organism identification and susceptibility test.
7. Explain the concept of narrow/broad spectrum of antimicrobials, PK/PD parameters and their significance on response to antimicrobial therapy.
8. Explain significance of monitoring of antimicrobial therapy in patient care.
9. Explain the concept of empiric, syndromic and culture-based treatment strategies for treating infections.
10. Explain the need to de-escalate from empirical broad-spectrum therapy to targeted narrow-spectrum therapy.
11. Explain the importance of appropriate use of antimicrobial agents, risk of antimicrobial resistance and spread of AMR in the health care environment and the community.
12. Explain the concept of normal microbial flora, colonization, contamination and infection with its role in deciding antimicrobial therapy.

13. Demonstrate knowledge about antimicrobial prophylaxis including peri-operative surgical prophylaxis regimens.
14. Describe the concept of first-, second- and third-line antimicrobial therapy for infections.
15. Explain the importance of restricted reporting of susceptibility data by the laboratory to control antimicrobial use.
16. Explain the concept and application of WHO tool for optimizing use of antimicrobial agents: Access, Watch and Reserve (AWaRe).
17. Explain the importance of antimicrobial formularies, consumption data and prescribing policies and processes to monitor use of antimicrobials in hospitals.
18. Effectively use information technology (LIS, WHO NET etc.) for data collection and surveillance of AMR in microbiology laboratory.
19. Explain significance of collecting local antimicrobial resistance data and its use in deciding direct empirical antimicrobial therapy.
20. Demonstrate knowledge and skills to develop antibiotic policy by using local AMR data in hospital.
21. Explain significance of adherence to antibiotic policy and antibiotic stewardship program.
22. Be a part of antimicrobial stewardship team for the institution.
23. Demonstrate knowledge about recent published guidelines that recommend antimicrobial treatment therapy in various clinical situations.
24. Effectively communicate with the patients/ relatives about the role of antimicrobial agents in their disease and advice on appropriate use.
25. Actively engage with patients, relatives and the community to advise on the role of antimicrobial agents in therapy and the threat of resistance.
26. Participate in clinical audit and quality improvement programmes relating to antimicrobial use.
27. Teach students, colleagues and other health professionals regarding antimicrobial use and resistance.

## AnnexureII

Student appraisal form for MD in Microbiology											
	Elements	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic aptitude and learning</b>										
1.1	Has knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc)										
1.3	Conduct of research and other scholarly activity assigned(e.g Posters, publications etc)										
1.4	Documentation of acquisition of competence (eg Log book)										
1.5	Performance in work based assessments										
1.6	Self-directed Learning										
<b>2</b>	<b>Work related to training</b>										



2.1	Practical skills that are appropriate for the level of training										
2.2	Respect for processes and procedures in the work space										

2.3	Ability to work with other members of the team										
2.4	Participation and compliance with the quality improvement process at the work environment										
2.5	Ability to record and document work accurately and appropriate for level of training										
<b>3</b>	<b>Professional attributes</b>										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
<b>4</b>	<b>Space for additional comments</b>										
<b>5</b>	<b>Disposition</b>										

	Has this assessment pattern been discussed with the trainee?	Yes	No								
	If not explain.										
	Name and Signature of the assessee										
	Name and Signature of the assessor										
	Date										

## COMPETENCY BASED POSTGRADUTE TRAINING PROGRAMME MD - FORENSIC MEDICINE & TOXICOLOGY

### Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

This programme will standardize and strengthen Forensic Medicine and Toxicology teaching at the post graduate level throughout the country so that it will benefit the judiciary and the legal system of the country in providing justice which will ultimately benefit the community at large. It will also help in achieving uniformity in undergraduate teaching.

### SUBJECT SPECIFIC LEARNING OBJECTIVES

#### GOALS

The **Goal** of MD Forensic Medicine is to train a doctor to become a competent medico-legal expert, teacher and researcher in the subject who:

1. is aware of medico legal aspects in various settings
2. is aware of contemporary advances and developments in the field of Forensic Medicine.
3. has acquired the competencies pertaining to the subject of Forensic Medicine that are required to be practiced at all levels of health system.
4. is oriented to the principles of research methodology.
5. has acquired skills in educating and imparting training to medical, paramedical and allied professionals.

#### OBJECTIVES

A post graduate student, upon successfully qualifying in the M.D (Forensic Medicine) examination, should be able to:

1. Become an expert in Forensic Medicine
2. Identify and define medico-legal problems as they emerge in the community and

work to resolve such problems by planning, implementing, evaluating and modulating Medico-legal services.

3. Undertake medico-legal responsibilities and discharge medico-legal duties in required settings.
4. Keep abreast with all recent developments and emerging trends in Forensic Medicine, Medical Ethics and the law.
5. Deal with general principles and practical problems related to forensic, clinical, emergency, environmental, medico-legal and occupational aspects of toxicology.
7. Deal with medico-legal aspects of Psychiatry, mental health and drug addiction.
8. Impart education in Forensic Medicine and Toxicology to under-graduate and post-graduate students with the help of modern teaching aids.
9. Assess the students' knowledge and skills in the subject of Forensic Medicine
10. Oriented to research methodology and conduct of research in the subject

### SUBJECT SPECIFIC COMPETENCIES

**By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:**

#### **A. Cognitive domain**

1. Describe the legal and medico-legal system in India.
2. Acquire knowledge on the philosophy and guiding principles of Forensic Medicine course.
3. Describe the programme goals and objectives of the Forensic Medicine course.
4. Acquire knowledge on conduct of medico-legal autopsy independently with required physical assistance, prepare report and derive inferences.
5. Outline the principles and objectives of postmortem examination.
6. Describe the formalities and procedures of medico-legal autopsies in accordance with existing conventions and the law.
7. Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory as well as other disciplines of medical science to logically arrive at a conclusion in medico-legal autopsies and examination of medico-legal cases.

8. Describe the principles of the techniques used in toxicological laboratory namely TLC (Thin Layer Chromatography), GLC (Gas Liquid Chromatography), AAS (Atomic Absorption Spectrophotometry), HPLC (High Performance Liquid Chromatography) and Breath Alcohol Analyzer.
9. Describe relevant legal/court procedures applicable to medico-legal/medical practice.
10. Describe the general forensic principles of ballistics, serology, analytical toxicology and photography.
11. Interpret, analyze and review medico-legal reports prepared by other medical officers at the time of need.
11. Describe role of DNA profile and its application in medico-legal practice.
12. Describe the law/s relating to poisons, drugs, cosmetics, narcotic drugs and psychotropic substances.
13. Describe the legal and ethical aspects of Forensic Procedures including Narco-analysis, Brain mapping and Polygraph etc.
14. Describe the medico-legal aspects of Psychiatry, addiction and mental health.

## **B. Affective domain**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the clinician or other colleagues to provide the best possible opinion.
2. Should be able to follow ethical principles in dealings with patients, police personnel, relatives and other health personnel and to respect their rights.
3. Follow medical etiquettes in dealing with each other.
4. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

## **C. Psychomotor domain**

At the end of the course, the student should acquire following skills and be able to:

1. Perform medico-legal autopsy independently with required physical assistance,

- preparereport and derive inferences.
2. Perform medico-legal examination of users of alcohol, drugs and poisons and preparereport.
  3. Perform medico-legal examination in cases of sexual offences and prepare report.
  4. Interpret histo-pathological, microbiological, radiological, chemical analysis, DNA profile and other investigative reports for medico-legal purposes.
  5. Perform medico-legal examination of bones, clothing, wet specimens and weapons.
  6. Depose as an expert witness in a court of Law on medico-legal matters.
  7. Examine, identify, prepare reports and initiate management on medico-legal cases in emergency set up.
  8. Identify and discharge all legal responsibilities in medico-legal matters.
  9. Plan, organize and supervise medico-legal work in general/teaching/district hospitals and in any health care set up.
  10. Collect, preserve and dispatch various samples and trace evidences to the concerned authorities in appropriate manner.
  11. Help and Advise authorities on matters related to medical ethics and medico-legal issues.
  12. Discharge duties in respect of forensic, clinical, emergency, environmental, medico-legal and occupational aspects of toxicology.
  13. Plan, organize and manage toxicological laboratory services in any health care set up.
  14. Provide information and consultation on all aspects of toxicology to professionals, industry, Government and the public at large.
  15. Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities.
  16. Do interaction with allied departments by rendering services in advanced laboratory investigations and relevant expert opinion.
  17. Participate in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research.

### **Time frame to acquire knowledge & skills:**

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First year of PG programme:

1. Orientation Programme
2. Basic autopsy skills.
3. Orientation to the applied aspects of Anatomy, Physiology, Biochemistry
4. General principles of Forensic Medicine.
5. Introduction to Medical Toxicology.
6. Assisting in scheduling of teaching sessions.
7. Participation in undergraduate teaching.
8. Posting for autopsy work, clinical forensic medicine and toxicology.
9. Participation in departmental activities
10. Participation in seminar, CME, workshop etc.
11. Orientation to organization and functioning of toxicology/research laboratory.
12. Preparation of thesis protocol.
13. Being self-updated with recent advances in the subject

#### Second year of PG programme:

1. Conduct of autopsy examination without supervision in routine autopsy cases
2. Conduct of autopsy examination with supervision in expert opinion cases.
3. Conduct of theory and practical sessions for undergraduates
4. Thesis and other research work
5. Clinical forensic medicine work for practical experience in medico-legal procedures and on-the-job practical training in medico-legal aspects of emergency medicine, radiology and other clinical disciplines.
6. Orientation to the applied aspects of Microbiology, Pathology, Blood Bank, Psychiatry as related to forensic sciences.
7. Posting for autopsy work, clinical forensic medicine and toxicology laboratory.
8. Attend court summons for cases conducted by themselves or where deputed to attend in cases where an expert is required to depose by Court of Law

#### Third year of PG programme:

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1. Organize teaching sessions and thesis work.

2. Submission of thesis six months prior to examination.
3. Posting for autopsy work, clinical forensic medicine and toxicology laboratory to continue.
4. The PG trainee shall be required to conduct minimum of 100 autopsy cases and minimum of 100 clinical cases during the entire training period.
5. Attend Court summons for cases conducted by themselves or when deputed where an expert is required to depose by the Court of Law.
6. The PG trainee shall be required to attend or accompany an expert to attend a minimum of 20 court summons, of which at least 5 should pertain to clinical cases.

## **Syllabus**

### **Course contents:**

#### **I. General Principles of Forensic Medicine and Toxicology**

- i. Identify the role of anatomy, physiology, biochemistry, microbiology, pathology, blood bank, psychiatry, radiology, forensic science laboratory as well as other disciplines of medical science to logically arrive at a conclusion in medico-legal autopsies and examination of medico-legal cases.
- ii. Describe the basic principles of techniques used in toxicological laboratory namely TLC, GLC, ASS, HPLC and Breath Alcohol Analyzer.
- iii. Execute the skills and knowledge expected at undergraduate level.
- iv. Basic bedside screening tests to detect common poisons.

#### **II. Basic Sciences and allied Subjects**

##### **A. Anatomy:** Anatomy of parts and organs of the body which are important from the medico-legal aspect.

- i. Describe surface and regional anatomy of head, neck, chest and abdomen.
- ii. Describe gross anatomy and blood supply of heart, brain, lungs, spleen, liver and



kidneys.

- iii. Describe gross anatomy of male and female genitalia.
- iv. Describe the comparative anatomy of male and female skeleton.
- v. Perform histological examination of various tissues.
- vi. Describe the development of foetus.

**B. Physiology and Biochemistry:** Mechanism of phenomena that are important in the body from the medico-legal viewpoint.

- i. Describe mechanism of fluid and electrolyte balance, thermoregulation in newborn and adults, endocrine functions.
- ii. Describe physiology of sexual behavior.
- iii. Describe physiological functioning of circulatory system, digestive system, respiratory system, haemopoietic system, central nervous system and reproductive system including pregnancy.

**C. Pathology:** Pathophysiology of vital processes and response mechanisms that modulate tissue and organ reaction to all forms of injury and have a bearing on antemortem and postmortem appearance in medico-legal cases, assessment of the duration of injuries and correlate trauma and disease.

- i. Describe pathology of inflammation and repair, immunity and hypersensitivity, Thrombosis and embolism, electric and ionizing radiation injuries, genetic factors in disease, deficiency disorders and malnutrition.
- ii. Describe pathology of myocardial infarction, congenital heart diseases, tuberculosis of lungs, cirrhosis of liver, diseases of glomeruli and tubules and interstitial; tissues of kidney, tumours, endocrine disorders, venereal diseases, spontaneous intracranial hemorrhages.
- iii. Describe the pathology of sudden death.
- iv. Describe local and systemic response to trauma and patho-physiology of shock.
- v. Describe pathology of common<sup>23</sup> infections and infestations of medico-legal significance.

**D. Dentistry:** Adequate knowledge of dentistry for solution of medico-legal problems like, injuries, age determination and identification, Bite mark analysis, Interpretation of OPG.

**E. Radiology:** Adequate knowledge of radiological procedures for solution of medico-legal problems.

**F. Fundamentals of Forensic Medicine:**

- i. Describe the general forensic principle of ballistics, serology, analytical toxicology and photography.
- ii. Interpret the scene of crime.
- iii. Describe role of DNA profile and its application in medico-legal practice.
- iv. Examine bloodstains for blood grouping, nuclear sexing, HLA typing, seminal stains and hair for medico-legal purpose.
- v. Describe ethical aspects of Forensic Procedures including Narco-analysis, Brain mapping and Polygraph

**III. Medical Ethics and Law (Medical Jurisprudence)**

- i. Describe the history of Forensic Medicine.
- ii. Describe the legal and medico-legal system in India.
- iii. Describe medical ethics and the law in relation to medical practice, declarations, oath, etiquette, Medical Council of India (NMC Act), disciplinary control, rights and duties of a registered medical practitioner's professional misconduct, consent, confidentiality, medical negligence (including all related issues) and Consumer Protection Act.
- iv. Professional Indemnity insurance.
- v. Describe medical ethics and law in relation to organ transplantation, biomedical human research and experimentation, human rights, cloning, genetic engineering, human genome, citizen's charter and international codes of medical ethics; Recent advances of Do not Resuscitate.
- vi. Describe the ethics and law in relation to artificial insemination, abortion, antenatal sex, foetus, genetics and euthanasia.
- vii. Interpret the ethics and law applicable to the human (clinical trials) and animal experimentation.
- viii. Describe ethics in relation to elderly, women and children.

- ix. Describe medical ethics and law in relation to nursing and other medical services/practices.
- x. Understanding about bio-ethics
- xi. Socio-ethical issues of hunger strike.

#### IV. Clinical Forensic Medicine

- i. Examine, assess legal implications and prepare report or certificate in cases of physical assault, suspected drunkenness, sexual offences (Women, child, third gender), consummation of marriage and disputed paternity, disputed maternity.
- ii. Collect, preserve and dispatch the specimen/material to the concerned authority and interpret the clinical and laboratory findings which are reported.
- iii. Examine injured person, prepare medico-legal report and initiate management.
- iv. Determine the age and establish identity of an individual for medico-legal purpose.
- v. Examine a person and assess disability in industrial accidents and diseases; Assessment as per Labor law and compensation.
- vi. Perform examination and interpret findings for medico-legal purposes in cases pertaining to pregnancy, delivery, artificial insemination, abortion, sterilization, Impotence, AIDS and infectious disease.
- vii. Describe normal and abnormal sexual behavior and its medico-legal implications.
- viii. Examine and assess the medical fitness of a person for insurance, government service, sickness and fitness on recovery from illness.
- ix. Examine medico-legal problems related to clinical disciplines of medicine and allied subjects, Pediatrics, Surgery and allied subjects, ENT, Ophthalmology, Obstetrics and Gynecology, Dermatology and Anesthesiology.
- x. Examine medico-legal problems related to children, women and elderly.
- xi. Identify the cases of torture and violation of human rights and issues thereto

#### V. Forensic Pathology

- i. Apply the principles involved in methods of identification of human remains by race, age, sex, religion, complexion, stature, hair, teeth, anthropometry, dactylography, footprints, hairs, tattoos, poroscopy and superimposition techniques.
- ii. Perform medico-legal postmortem and be able to exhume, collect, preserve and

dispatch specimens or trace evidence to the appropriate authority.

- iii. Diagnose and describe the pathology of wounds, mechanical and regional injuries, ballistics and wound ballistics, electrical injuries, lightning, neglect and starvation, thermal injuries, deaths associated with sexual offences, pregnancy, delivery, abortion, child abuse, dysbarism and barotraumas.
- iv. Describe patho-physiology of shock and neurogenic shock.
- v. Describe patho-physiology of asphyxia, classification, medico-legal aspects and postmortem findings of different types of asphyxial deaths.
- vi. Diagnose and classify death, identify the signs of death, postmortem changes, interpret autopsy findings, artifacts and results of the other relevant investigations to logically conclude the cause, manner (suicidal, homicidal and accidental) and time of death.
- vii. Manage medico-legal responsibilities in mass disasters involving multiple deaths like fire, traffic accident, aircraft accident, rail accident and natural calamities.
- viii. Demonstrate postmortem findings in infant death and to differentiate amongst livebirth, still birth and dead born.
- ix. Perform postmortem examination in cases of death in custody, torture and violation of human rights.
- x. Perform postmortem examination in cases of death due to alleged medical negligence as in operative and anesthetic deaths.

## VI. Toxicology

- i. Describe the law relating to poisons, drugs, cosmetics, narcotic drugs and
  - a. psychotropic substances.
- ii. Examine and diagnose poisoning cases and apply principles of general management and organ system approach for the management of poisoning cases.
- iii. Describe the basic principles of pharmacokinetics and pharmacodynamics of poisonous substances.
- iv. Describe the toxic hazards of occupation, industry, environment and the principles of predictive toxicology.
- v. Collect, preserve and dispatch material/s for analysis, interpret the laboratory

- findings and perform the Medico-legal formalities in a case of poisoning.
- vi. Demonstrate the methods of identification and analysis of common poisons
  - vii. Describe the signs, symptoms, diagnosis and management of common acute and chronic poisoning due to:
    - a. Corrosives
    - b. Nonmetallic substances
    - c. Insecticides and weed killers
    - d. Metallic substances
    - e. Vegetable and organic irritants
    - f. Somniferous compounds
    - g. Inebriant substances
    - h. Deliriant substances
    - i. Food Contamination/adulteration.
    - j. Substances causing spinal and cardiac toxicity
    - k. Substances causing asphyxia (Asphyxiants)
    - l. Household toxins
    - m. Toxic envenomation
    - n. Biological and chemical warfare
    - o. Environmental intoxicants
    - p. Occupational intoxicants

## VII. Forensic Psychiatry

- i. Explain the common terminologies of forensic importance in Psychiatry.
- ii. Describe the medico-legal aspects of Psychiatry and mental health.
- iii. Describe medico-legal aspects of drug addiction.
- iv. Describe role of Psychiatry in criminal investigation, punishment and trial.
- v. Describe the civil and criminal responsibilities of a mentally ill person.
- vi. Describe the role of Psychology in criminal investigation, punishment and trial

## TEACHING AND LEARNING METHODS

### Teaching methodology

1. **Lectures:** Lectures are to be kept to a minimum (10 per year). They may, however, be employed for teaching certain topics. Lectures may be didactic or integrated.

The course shall be of three years, organized in six units (0-5). This modular pattern is a guideline for the department, to organize training. Training programme can be modified depending upon the work load and academic assignments of the department.

2. **Journal Club & Subject seminars:**

Both are recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the E-Log Book relevant details. Further, every PG trainee must make a presentation from the allotted journal(s), selected articles and a total of 12 seminar presentations in three years. The presentations would be evaluated and would carry weightage for internal assessment.

3. **Case Presentations:** Minimum of 5 cases to be presented by every PG trainee each year. They will be assessed using check lists and entries should be made in the log book
4. **Clinico-Pathological correlation \ Conference:** Recommended once a month for all post graduate students. Presentation is to be done by rotation. If cases are not available, it could be supplemented by published CPCs.
5. **Inter-Departmental Meetings:** These meetings should be attended by post graduate students and relevant entries must be made in the Log Book.
6. **Teaching Skills:** The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns for which they are trained at Department of Medical Education (DOME).
7. Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific fora.

8. **Continuing Medical Education Programmes (CME):** At least two CME programmes should be attended by each student in 3 years.
9. **Conferences:** The student to attend courses, conferences and seminars relevant to the specialty.
10. **Rotation:**  
Other than the Department of Forensic Medicine, student may be posted for training in the following clinical disciplines for a given period of time on rotational basis:

	Place of posting	First year	Second year	Third year
01	Trauma & Emergency/ Casualty / Emergency medicine department	1 month	15 days	15 days
02	Radiology	7 days	5 days	3 days
03	Psychiatry	5 days	3 days	2 days
04	Forensic science lab	7 days	15 days	Not required
05	Histopathology	7 days	5 days	3 days
06	Dentistry	7 days	3 days	5 days

11. e-learning activities to be done by the students wherever applicable.
12. District Residency Programme - All post-graduate students under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course curriculum. For 2 months they will be posted in Department of Forensic Medicine and Toxicology, Government Medical College (BIMS), Belagavi and 1 month at Primary Health centre. Such rotation shall take place in the 3rd or 4th or 5th semester of the postgraduate programme – log book to be maintained for the same.
13. All students will do thesis related research and will write thesis.
14. It shall be the duty of the post-graduate students to maintain record (e-Log) books which needs to be updated on a weekly basis about the work being carried out by them during the period of training and get it assessed monthly from their respective guides.

## ASSESSMENT

FORMATIVE ASSESSMENT, i.e., during the training

Internal Assessment will be frequent, covering all domains of learning and will be used to provide feedback to improve learning; it will also cover professionalism and communication skills. The Internal Assessment will be conducted in both theory and clinical examination.

**Quarterly assessment during the MD training will be Formative Assessment based on following educational activities –**

1. Journal based / recent advances learning
2. **Patient based /Laboratory or Skill based learning**
3. Self-directed learning and teaching
4. **Departmental and interdepartmental learning activity**
5. External and Outreach Activities / CMEs / Conferences

Internal assessment will be conducted for the postgraduates at the end of each year which will include both theory and practical. (At the end of First year, Theory – paper I & II and practical will be conducted. At the end of 2<sup>nd</sup> year, Theory – paper III & IV and practical will be conducted.) Preliminary examination (Theory and Practical) will be conducted prior to University examination as per the University examination format. Practical examinations will be inclusive of OSPE.

The performance of the candidate in the formative and internal assessment will be updated periodically in the student appraisal form (Annexure I).

**Eligibility requirements for PG Students in Board Specialty and Super Specialty for appearing in university examination.**

- i. Have minimum one Poster presentation or Podium presentation at a National/Zonal/State Conference of his/her specialty.
- ii. Have minimum one Research paper published in journal of his/her specialty as first author.
- iii. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
- iv. Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.



- v. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) Skills in the first year of the course conducted by the institution.
  - vi. Thesis acceptance by all evaluators before the conduct of University Examination.
- Attendance: 80% of the working days of the course is mandatory.

#### SUMMATIVE ASSESSMENT, i.e., assessment at the end of each year

The Postgraduate examination will be in three parts:

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2023.

The examination shall be in three parts:

#### 1. Thesis

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and practical examination. A PG trainee shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory, dissertation is accepted and the candidate has fulfilled all the eligibility criteria required as mentioned above.

#### 2. Theory Examination:

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify PG trainee's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for

M.D. shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

### A. Theory: 400 Marks

There shall be four papers, each of three hours duration. Total marks of each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

Type of Questions	Number of questions	Marks for each question	Total Marks
Long Essay questions	10	10	100

There shall be four papers each of three hours duration. These are:

**Paper 1:** Basic of Forensic Medicine, basic sciences and allied subjects.

**Paper II:** Clinical Forensic Medicine and medical jurisprudence.

**Paper III:** Forensic pathology and toxicology.

**Paper IV:** Recent advances in Forensic Medicine, Forensic Psychiatry, Medical Toxicology, applied aspects of clinical disciplines and forensic sciences.

THEORY	
No. of Theory paper	04
Marks for each Theory paper	100 marks
Total marks for Theory Paper	400 marks
Passing minimum for Theory	200/400 (40% minimum in each paper)

### 3. Practical Examination:

Practical examination & Viva-voce would be spread over two days and should be as follows:

PRACTICAL	
1. Dissertation presentation	20 marks
2. OSPE	30 marks (6 stations x 5 marks)
3. Long Case	100 marks
4. Short Cases	2 x 40 = 80 marks

<b>5. Subject specific assessment</b>	<b>70 marks</b>
<b>Total</b>	<b>300 marks</b>
<b>Passing minimum for Practical's</b>	<b>150/300 (50%)</b>

1. Dissertation presentation – 20 marks.  
Dissertation will be evaluated by the 2 external examiners from outside state for 10 marks each. They will look into Timely collection and compiling of data, proper statistical analysis if any, results discussion and conclusion. They will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce.
2. OSPE – 6 stations of 5 marks each
  - i. Station 1 – Microscopic slide 1
  - ii. Station 2 – Toxicological specimen 1
  - iii. Station 3 – X-ray
  - iv. Station 4 – Photograph
  - v. Station 5 – Microscopic slide 1
  - vi. Station 6 - Toxicological specimen 1
3. Long case – Adult / Fetal autopsy or Organ dissections – 100 marks
4. Short Cases – 2 cases 40 marks each
  - i. Examination of Victim and accused of sexual assault.
  - ii. Examination and certification of injuries followed by Weapon examination.
5. Subject Specific Assessment exercises – 6 exercises – 70 marks
  - i. Skeletal remains examination – 10 marks
  - ii. Age estimation by physical, dental and radiological examination – 10 marks
  - iii. Examination and certification of mentally ill person – 10 marks
  - iv. Examination and certification of drunkenness – 10 marks
  - v. Expert opinion – 10 marks
  - vi. Pedagogy – 20 marks

#### **VIVA-VOCE – 100 marks**

- Viva-voce examination – 100 marks

<b>Maximum marks for M.D. in Forensic Medicine &amp; Toxicology</b>	<b>Theory</b>	<b>Practical</b>	<b>Viva</b>	<b>Grand Total</b>
	<b>400 marks</b>	<b>24 300 marks</b>	<b>100 marks</b>	<b>800 marks</b>

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The candidate shall secure not less than 50% marks in each head of passing which shall include

- (1) Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)
- (2) Practical/Clinical and Viva voce - aggregate 50%
- (3) If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.

No grace mark is permitted in post-graduate examination either for theory or for practical.

#### Day 1

- Short Cases – 2 cases
- Subject Specific Assessment exercises - 5 exercises
- OSPE – 6 stations

#### Day 2

- Long case – Adult / Fetus Adult / Fetal autopsy or Organ dissections.
- Dissertation Presentation.
- Pedagogy - For assessment of research/teaching ability
- Grand Viva Voce.

\* The University shall conduct not more than two examinations in a year for any subject, with an interval of not less than 4 months and not more than 8 months between two examinations.

### Recommended Reading

#### **Books (latest edition)**

1. Subramanyam BV. Modi's Medical Jurisprudence and Toxicology. Butterworths India, New Delhi. 24
2. Nundy A. Principles of Forensic Medicine, New Central Book Agency Calcutta.

3. Lyon's Medical Jurisprudence for India. Delhi Law House, Delhi.
4. Reddy KSN. The Essentials of Forensic Medicine and Toxicology, K. Saguna Devi Publishers, Hyderabad.
5. Parikh CK. Parikh's Textbook of Medical Jurisprudence, Forensic Medicine and Toxicology, CBS Publishers and Distributors, New Delhi.
6. Bernard Knight. Forensic Pathology. Arnold Publishers London.
7. Di Maio VJ, Di Maio D. Forensic Pathology. CRC Press New York.
8. Camps FE. Gradwohl's legal Medicine. Bristol: John Wright and Sons Ltd.
9. American College of Legal Medicine Textbook Committee. Legal Medicine Mosby Publishers, USA.
10. Di Maio VJM. Gunshot Wounds, CRC Press USA.
11. Gordon I, Shapiro HA, Berson SD. Forensic Medicine – A Guide to Principle. Churchill Livingstone New York.
12. Mant AK. Taylor's Principles and Practice of Medical Jurisprudence, Churchill Livingstone, New York.
13. Parikh CK. Medicolegal Postmortems in India. Medical Publications, Bombay.
14. Gresham GA, Turner AF. Postmortem Procedures An illustrated Text Book. Wolfe Medical Publications.
15. Ludwig J. Current Methods of Autopsy Practice. WB Saunders Company, London.
16. Gordon I, Turner R. Medical Jurisprudence E and S Livingstone Ltd. London.
17. Spitz WU, Fisher RS. Medico-legal Investigation of Death. Charles Thomas Publishers.
18. Schroeder O.C. Dental Jurisprudence. PSG Publishing Company, Littleton, Massachusetts.
19. Stark MM. A Physicians Guide to Clinical Forensic Medicine. Humana Press Totowa, New Jersey.
20. Olshakar JS, Jackson JS. Jackson MC, Smock WS. Forensic Emergency Medicine. Lippincott William and Wilkins, Philadelphia.
21. Norah Rudin, Keith Inman. An introduction to Forensic DNA Analysis. CRC Press, London.
22. Robertson J, Ross AM, Burgoyne LA. DNA in Forensic Science - Theory, Technique

and Application. Ellis Horwood, UK

23. Curry AS. Method of Forensic Science Vol. I-III. Inter-science Publishers London.
24. Clement JG, Ranson DL. Craniofacial Identification in Forensic Medicine. Arnold Publishers, London.
25. Sellier GK, Kneubuechl BP. Wound Ballistics and the scientific background. Elsevier, Amsterdam.
26. Bernard Knight. Simpson's Forensic Medicine. Arnold Publishers London.
27. Bernard Knight. Legal aspects of Medical Practice. Churchill Livingstone New York.
28. Gunn and Taylor. Forensic Psychiatry Clinical, Legal and Ethical issues. Butterworth Heinemann
29. G Gustafson. Forensic Odontology. Staples Press.
30. Gonzalez TA. Legal Medicine, Pathology and Toxicology - Appleton Century-Crofts Inc. New York.
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32. Lincoln PJ, Thomas J. Forensic DNA Profiling Protocols. Methods in Molecular Biology, Vol. 98, Humana Press, Totowa, New Jersey.
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58. Guidelines for Poison Control. Published by WHO, UNEP and ILO
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## Journals

### International Journals

1. Medicine, Science & the Law
2. American Journal of Forensic Medicine & Pathology
3. Egyptian Journal of Forensic Sciences

4. Forensic Science International
5. Australian Journal of Forensic Sciences

#### **National Journals**

1. Journal of Indian Academy of Forensic Medicine
2. Journal of South India Medicolegal Association
3. Journal of Indian Society of toxicology
4. Journal of Forensic Medicine Science and Law
5. Journal of Forensic Medicine and Toxicology
6. Indian Journal of Forensic Medicine and Pathology



## Annexure 1

### Postgraduate Students Appraisal Form Para – Clinical Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based / recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self-directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs / Conferences				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications

Yes/ No

Remarks\* \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

**SIGNATURE OF ASSESSEE**

**SIGNATURE OF CONSULTANT**

**SIGNATURE OF HOD**

## **CHAPTER - I**

### **Regulations for Post Graduate Degree Courses in Medical Sciences**

**1. Branches of Study : Postgraduate Degree Courses** The following courses of studies may be pursued.

**M.D. (Doctor of Medicine)**

- 1 Anaesthesiology
- 2 Dermatology, Venereology and Leprosy
- 3 General Medicine
- 4 Paediatrics
- 5 Psychiatry
- 6 Radiodiagnosis
- 7 Pulmonary Medicine
8. Community Medicine

**and such other subjects which may be introduced in future from time to time and recognized by National Medical Commission.**

**M.S. (Master of Surgery)**

- 1 General Surgery
- 2 Obstetrics and Gynaecology
- 3 Ophthalmology
- 4 Orthopaedics
- 5 Oto-Rhino-Laryngology

**and such other subject which may be introduced in future from time to time and recognized by National Medical Commission.**

**Goal :** The goal of post-graduate medical education shall be to produce competent specialist and medical teachers recognised by the fraternity as the graduating scholars, building upon their undergraduate education and skills who shall -

- i. Recognise the health needs of the community and carry out professional obligations ethically keeping in view the objectives of the national health policy;
- ii. Have mastered most of the competencies, pertaining to the respective speciality, that is required to be practised at the

secondary and the tertiary levels of the health care delivery system;

- iii. Be aware of the contemporary advancements and developments in the respective discipline concerned and shall progress accordingly
- iv. Have acquired a spirit of scientific inquiry and is oriented to the principles of research methodology and epidemiology;
- v. Have acquired the basic skills in the teaching of medical and paramedical professionals;
- vi. Acquire basic management skills in human resources, materials and resource management related to health care delivery, general hospital management, principal inventory skills and counselling;
- vii. Develop personal characteristics and attitudes required for professional life such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals;
- viii. Become an exemplary citizen by observing the highest standards of professional ethics and working towards fulfilling social and professional obligations to respond to national aspirations.

### **General Objectives**

At the end of the postgraduate training in the discipline concerned the student shall be able to:

- i) Recognize the importance of the concerned speciality in the context of the health need of the community and the national priorities in the health sector.
- ii) Practice the speciality concerned ethically and in step with the principles of primary health care.
- iii) Demonstrate sufficient understanding of the basic sciences relevant to the concerned speciality.

- iv) Identify social, economic, environmental, biological and emotional determinants of health in a given case, and take them into account while planning therapeutic rehabilitative, preventive and promotive measures/ strategies.
- v) Diagnose and manage majority of the conditions in the speciality concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- vi) Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.
- vii) Demonstrate skills in documentation of individual case details as well as morbidity and mortality data relevant to the assigned situation.
- viii) Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behaviour in accordance with the social norms and expectations.
- ix) Play the assigned role in the implementation of national health programmes, effectively and responsibly.
- x) Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.
- xi) Develop skills as a self-directed learner, recognize continuing educational needs and use appropriate learning resources.
- xii) Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyse relevant published research literature.
- xiii) Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- xiv) Function as an effective leader of a health team engaged in health care, research or training.

### **Statement of the Competencies**

Keeping in view the general objectives of postgraduate training, each discipline shall aim at development of specific competencies, which shall be defined and spelt

out in clear terms. Each department shall produce a statement and bring it to the notice of the trainees in the beginning of the programme so that he or she can direct the efforts towards the attainment of these competencies.

Components of the PG Curriculum The major components of the PG curriculum shall be:

- Theoretical knowledge
- Practical / clinical Skills
- Training in Thesis.
- Attitudes, including communication.
- Training in research methodology.

**3. Eligibility for Admission : ELIGIBILITY CRITERIA FOR SELECTION OF POSTGRADUATE STUDENTS**

- A. Students for postgraduate medical courses shall be selected strictly on the basis of their academic merit.
- B. For determining the academic merit, the university shall adopt the following procedures for degree courses:
- C. Eligibility to pursue a post-graduate broad-speciality course in Medicine shall be as per “NMC, National Exit Test Regulations, 2023”.

Provided that until the first batch based on National Exit Test (NExT) becomes eligible for admission in broad-speciality courses, the existing system of admission through National Eligibility-cum-Entrance Test-Postgraduate (NEET-PG) as per Post-Graduate Medical Education Regulation, 2000 (PGMER-2000) shall Continue

The candidate has to make an application to the KAHER with the following documents along with the prescribed fee :

- 1 MBBS pass / degree certificate issued by the KAHER. Recognized Universities approved by NMC.
- 2 Marks cards of all the examinations passed during MBBS course.
- 3 Attempt Certificate issued by the Principal.
- 4 Certificate regarding the recognition of the medical college by the National Medical Commission.
- 5 Completion of internship certificate.
- 6 In case internship was done in a non-teaching hospital, a certificate from the National Medical Commission that the hospital has been recognized for internship.
- 7 Registration by any State Medical Council.

Candidates should obtain the Eligibility Certificate before the last date for admission as notified by the KAHER.

A candidate who has been admitted to postgraduate course should register his / her name in the KAHER within a month of admission after paying the registration fees.

**4. Intake of Students**

The intake of students to each course shall be in accordance with the NMC approval.

**5. Course of the Study**

**Duration :**

**a) M.D./M.S. Degree Courses**

The course of study shall be for a period of 3 years

**Training Programme:**

- (i) Post-graduate training shall consist of training of the students through lectures, seminars, journal clubs, group discussions, participation in laboratory and experimental work, involvement in research, clinical meetings, grand rounds, clinico-pathological conferences, practical training in the diagnosis and medical and surgical treatment, training in the basic medical sciences as well as in allied clinical specialties, etc. as per the requirement of Speciality training.
- (ii) All post-graduate students will work as full-time resident doctors. They will work for reasonable working hours and will be provided reasonable time for rest in a day.
- (iii) All broad-speciality will do thesis related research and will write thesis.
- (iv) Every institution undertaking post-graduate training programme shall set up an Academic Cell, under the Chairmanship of a senior faculty member, who shall monitor the implementation of training programmes in each speciality and ensure its quality as mandated by the PGMEB.
- (v) The training programmes shall be updated as and when required while keeping in mind the curriculum requirements and other relevant requirements prescribed by PGMEB from time to time. The structured training programme shall be written and strictly followed, to enable the examiners to determine the training undergone by the candidates.



- (vi) Post-graduate students of broad and super Speciality degree courses shall maintain a dynamic e-log book which needs to be updated on a weekly basis about the work being carried out by them and the training programme undergone during the period of training. Provided that M.S. /M.Ch students shall mandatorily enter details of surgical procedures assisted or done independently.
- (vii) It shall be the duty of the Post-graduate guide imparting the training to assess and authenticate monthly the record (e-Log) books.
- (viii) The post-graduate students shall essentially be required to participate in the teaching and training programme of undergraduate students and interns.
- (ix) During the training for award of Degree/Diploma, there shall be proper training in basic medical sciences related to the disciplines concerned. During the training programmes emphasis has to be laid on preventive and social aspects. All post-graduate medical college/institution shall have facilities for teaching the basic science subjects as per guidelines

**(x) Course in Research Methodology -**

- a. All post-graduate students shall complete an online course NPTEL in Research Methodology.
- b. The students shall have to register on the Swayam portal.
- c. The students are expected to complete the course in the first year.
- d. The online NPTEL certificate generated on successful completion of the course and examination thereafter, will be acceptable evidence of having completed this course.
- e. The above certification shall be a mandatory requirement to be eligible to appear for the final examination of the respective post-graduate course.
- f. This requirement shall be applicable for all post-graduate students.

**(xi) Course in Ethics -**

- a. All post-graduate students shall complete course in ethics including Good Clinical Practices and Good Laboratory Practices, whichever is relevant to

them, to be conducted by institutions/Universities.

- b. The students are expected to complete the course in the first year.
- c. No post-graduate student shall be permitted to appear in the examination without the above certification.

**(xii) Course in Cardiac Life Support Skills -**

- a. All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institution.
- b. The students are expected to complete the course in the first year.
- c. No post-graduate student shall be permitted to appear in the examination without the above certification.

**6. Attendance, Progress and Conduct**

- a) A candidate pursuing degree course should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to run a clinic/laboratory/nursing home while studying postgraduate course.
- b) Each year shall be taken as a unit for the purpose of calculating attendance.
- C) Every student shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not be absent himself / herself from work without valid reasons.
- D ) Every candidate is required to attend a minimum of 80% of the training during each academic year of the post graduate course. Provided further, leave of any kind shall not be counted as part of academic term without prejudice to minimum 80% attendance of training period every year

e) Any student who fails to complete the course in the manner stated above shall not be permitted to appear for the KAHER Examinations.

## **7) Leave Rules for Post-graduate Students -**

The following leave rules will be followed:

- a. Every post-graduate student will be given minimum 20 days of paid leave (casual leave) per year, 5 days academic leave per year. Thus a student is entitled to 52 weekly offs and 20 paid casual leaves per year.
- b. Subject to exigencies of work, post-graduate students will be allowed one weekly holiday.
- c. Female post-graduate students shall be allowed maternity leave as per existing Government rules and regulations.
- d. Male post-graduate students shall be allowed paternity leave as per existing Government rules and regulations.
- e. In addition to 20 days' paid leave, the candidates will be allowed.
- f. If candidate avails leave in excess of the permitted number of days, his/her term of course shall be extended by the same number of days to complete the training period. However, one shall be able to appear in the examination if one has 80% (eighty per cent) of the attendance.

A student shall require 80% attendance on working days i.e. 751 days for appearing for exams.

**8) Work diary / E- Log Book-**Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. E Log book will be maintained digitally. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution and presented in the university practical/clinical examination. The log book is thus a record of various activities by the student like: Overall participation & performance, attendance, participation in sessions, record of completion of pre-determined activities, and acquisition of selected competencies.

- a) Periodic tests: In case of degree courses of three years duration, the concerned departments should conduct three internal assessments, two of them be annual at the end of first and second year. The third internal assessment will be preliminary examination which will be held three months before the final

examination conducted by the college similar to final University Examination. The tests may include written papers, clinicals (Direct Observation of Procedural skills)/ OSCE/Case Based discussion/ Mini Cex and viva voce. Records and marks obtained in such tests will be maintained by the Department and sent to the concerned authority.

- b) Records: Records and marks obtained in tests will be maintained by the head of the Department and will be made available to the University or NMC.

## **9. Dissertation**

- A) Every candidate pursuing MD/MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation.
- B) The dissertation is aimed to train a post graduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, comparison of results and drawing conclusions.
- C) Every candidate shall submit to the Registrar (Academic) of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation

work within six months from the date of commencement of the course on or before the dates notified by the KAHER. The synopsis shall be sent through the proper channel.

- D) Synopsis will be reviewed and the dissertation topic will be registered by the KAHER. No change in the dissertation topic or guide shall be made without prior approval of the KAHER.
- E) The dissertation should be written under the following headings:
  - i. Introduction
  - ii. Aims or Objectives of study
  - iii. Review of Literature
  - iv. Material and Methods
  - v. Results
  - vi. Discussion
  - vii. Conclusion
  - viii. Summary
  - ix. References
  - x. Tables
  - xi. Annexures
- F) The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexures. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The dissertation shall be certified by the Guide, Head of the department and Head of the Institution.
- G) Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the Institute.

- H) The dissertation shall be valued by 2 EXTERNAL examiners appointed by the KAHER and assessed for 20 marks.
- I) Guide: The academic qualification and teaching experience required for recognition by KAHER as a guide for dissertation work is as per Medical Council of India, Minimum Qualifications for Teachers in Medical Institutions Regulations, 2000. -Teachers in a medical college/institution having a total of eight years teaching experience out of which at least five years teaching experience as Lecturer or Assistant Professor gained after obtaining post graduate degree shall be recognized as post graduate teachers.
- J) A Co-guide may be included provided the work requires substantial contribution from a sister department or from another medical institution recognized for teaching/training by KAHER /National Medical Commission of India. The co-guide shall be a recognized post graduate teacher of KAHER.
- K) Change of guide: In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the KAHER.

#### **9) DISTRICT RESIDENCY PROGRAMME (DRP) -**

##### **Preamble:**

Doctors have to be trained in diverse settings including those which are close to the community. Hence, they should be trained in the District Health System / the District Hospitals. Provided that in respect of M.D./M.S. students admitted with effect from academic session 2021, the training imparted as part of the District Residency Programme, shall be considered as training imparted in a medical institution.

**Objectives:** The main objectives of the District Residency Programme (DRP) would be:

- a. To expose the post-graduate student to the District Health System/ District Hospital and involve them in health care services being provided by District Health System /District Hospital for learning while serving;
- b. To acquaint them with the planning, implementation, monitoring, and assessment of outcomes of the National Health programmes at the district level.

- c. To orient them to promotive, preventive, curative and rehabilitative services being provided by various categories of healthcare professionals under the umbrella of the National Health Mission. In doing so, the post-graduate medical students would also be contributing towards strengthening of services of the District Health System as Speciality resident doctors working as members of the district teams.

**d. District Residency Programme:**

All post-graduate students pursuing M.D./M.S. in broad specialties in all medical colleges/institutions under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the postgraduate programme. This rotation shall be termed as 'District Residency Programme' (DRP) and the post-graduate medical student undergoing training shall be termed as a 'District Resident'.

**e) Training and Responsibilities of District Residents:**

The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC). During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/ sections/services at the District Health System/ District Hospital. The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Speciality and encompass night duties. Post-graduate students of specialties where direct patient care is not involved will be trained by District Health System/ District Hospital teams within the available avenues in coordination with the District Health Officer/Chief Medical Officer. They would be trained in and contribute to the diagnostic/laboratory services, pharmacy services, forensic services, general clinical duties, managerial roles, public health programmes etc., as applicable. They may also be posted in research units / facilities, laboratories and field sites of the Indian Council of Medical Research and other national research organizations.

**f) Stipend and Leave for District Residents:**

The District Residents shall continue to draw full stipend from their respective medical colleges for the duration of the rotation subject to the attendance record submitted by the appropriate district authorities to the parent medical college/institution, based on methods and system as prescribed. Subject to exigencies of work, the District Resident will be allowed one weekly holiday by rotation. They shall also be entitled to leave benefits as per the rules/ guidelines of the parent college/university.

**g) Training during DRP and Certification thereof:**

- a. Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. Such monitoring systems shall also be accessible to the State/Union Territory Steering Committee and the National Coordination Cell.
- b. The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.
- c. Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective post-graduate course.
- d. The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to be decided by the PGMEB to the concerned medical college and the Govt. of the State/UT.

**11) Scheme of Examination-**

**M.D./M.S. Degree shall consist of**

Both Formative Assessment (examination) and Summative Assessment (examination) consisting of Theory, Clinical/Practical and Viva Voce.

Both Formative Assessment (examination) and Summative Assessment (examination). shall consist of Theory, Clinical and Viva Voce.

The university shall conduct not more than two examinations in a year, for any subject, with an interval of not less than 4 and not more than 8 months between the two examinations.



**Formative Assessment:**

Formative assessment should be continual and should assess medical knowledge, procedural and academic skills, interpersonal skills, professionalism, self- directed and ability to practice in the system.

**General Principles-**

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

**SUMMATIVE ASSESSMENT**

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS 2023. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

**Methodology**

Broad Specialties: Doctor of Medicine (M.D.)/Master of Surgery (M.S.): M.D./M.S. examinations, in any subject shall consist of theory papers, and clinical/practical and viva voce examinations and Dissertation..

**a. Theory:**

The theory examination (both formative and summative) may be of descriptive answer of a question type. Theory examination for summative examination shall be of four theory papers. The first and the fourth paper shall be on basic medical science and recent advances, respectively. The theory examination shall be held well in advance before the clinical and practical examination.

**b. Practical and viva voce**

i. Clinical examination for the subjects in clinical sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a consultant/specialist/teacher, for which candidates shall be examined for one long case and two short cases.

ii. Practical examination for other subjects shall be conducted to test the knowledge and competence of the candidates for making valid and relevant observations based on the experimental/ laboratory studies and his ability to perform such studies as are relevant to his subject.

iii. The viva voce examination shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the Speciality.

iv. Practical examination shall include Objective Structured Clinical Examination (OSCE)

- c) **Dissertation** : Every candidate shall carry out work and submit a dissertation. Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

#### **Examiners:**

- a. The examiner (both internal and external) for the post-graduate examination in Broad and Super Specialties shall have three years' experience as recognised Post-graduate Guide in the concerned subject.
- b. The minimum number of examiners for post-graduate examination shall be four. Out of which, at least two shall be external examiners and least one of them shall be from different university outside the state.
- c. An examiner shall not be appointed for more than two consecutive regular examinations for the same institution.

#### **Valuation:**

- a. All the teachers of the other colleges of the concerned University or other Universities, who are eligible to be post-graduate examiners, can perform the valuation of the answer scripts.
- b. All the answer scripts shall be subjected for two valuations by the concerned University. The average of the total marks awarded by the two valuers for the paper, which is rounded off to the nearest integer (whole number), shall be considered for computation of the results. All the answer scripts, where the difference between two valuations is 15% and more of the total marks prescribed

for the paper, shall be subjected to third valuation. The average of the best two total marks, awarded by the three evaluators for the paper, rounded off to the nearest integer (whole number), shall be considered for final computation of the results.

- c. c. After the computation and declaration of the results, under no circumstances, revaluation is permitted.
- d. d. All the Health Universities/Institutions imparting post-graduate courses shall implement digital valuation.

**L) Revised Eligibility requirements for PG Students in Broad Speciality for appearing in University examination:**

- Have minimum one Poster presentation or Podium presentation at a National / Zonal / State Conference of his / her specialty.
- Have minimum one Research paper published in journal of his / her specialty as first author.
- Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
- Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
- Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
- Thesis acceptance by all evaluators before the conduct of University Examination.

**Written Examination (Theory):** A written examination shall consist of four question papers, each of three hours duration. Each paper shall carry 100 marks. Out of the four papers, the 1st paper in clinical subjects will be on applied aspects of basic medical sciences. Recent advances shall be covered in 4th paper. In basic medical subjects and para-clinical subjects, questions on applied clinical aspects should also be asked.

<b>Paper</b>	<b>No. of Questions</b>	<b>Marks for each Question</b>	<b>Total Marks</b>
Paper-I	10	10	100
Paper-II	10	10	100
Paper-III	10	10	100
Paper-IV	10	10	100
		<b>GRAND TOTAL</b>	<b>400</b>

### Practical/Clinical Examination :

a) In case of practical examination, it should be aimed at assessing competence and skills, Techniques of procedures as well as testing students ability to make relevant and valid observations, interpretations and inference of laboratory or experimental work relating to his/her-subject.

b) In case of clinical examination, it should aim at examining clinical skills and competence of candidates for undertaking independent work as a specialist. Each candidate should examine at least one long case and two short cases.

c) The total marks for practical/clinical examination shall be **300**.

**Viva Voce:** Viva Voce Examination shall aim at assessing depth of knowledge, logical reasoning and oral communication skills. The total marks shall be 100.

Criteria for declaring as pass in KAHER Examination: A candidate shall secure not less than 50% marks in each head of passing which shall include

- (1) Theory,
- (2) Practical including clinical and viva voce examination separately.

### Clinical:

Description	M.D/M.S.
<b>THEORY</b>	
• No. of Theory papers	04
• Marks for each Theory paper	100
<b>Total marks for Theory papers</b>	<b>400</b>
Passing minimum for Theory	200/400 (40% minimum in each paper and an aggregate of 50 % in theory to be declared pass in theory )
<b>PRACTICALS</b>	300
• Dissertation	20
• OSCE	25 (5 stations x 5 marks)
• Subject specific assessment	255
<b>VIVA</b>	100
• Criteria for passing	A candidate in a subject has to score theory and practical + viva separately with a minimum of 50% marks.

<ul style="list-style-type: none"> <li>Criteria for passing</li> </ul>	A candidate in a subject has to score theory and practical + viva separately with a minimum of 50% marks.
------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------

**Passing criteria :**

“Obtaining a minimum of 50% marks in theory as well as Practical separately shall be mandatory for passing the whole Examination. (Obtaining a minimum of 40% marks in each theory paper and not less than 50% cumulatively in all the 4 papers shall be mandatory. Obtaining a minimum of 50% marks (clinical and Viva-voce together) in Practical is mandatory)”.

A candidate securing less than 50% of marks as described above shall be declared to have failed in the examination. Failed candidate may appear in any subsequent examination upon payment of fresh fee to the Controller of Examinations.

1. Declaration of distinction : A successful candidate passing the KAHER examination in first attempt will be declared to have passed the examination with distinction, if the grand total aggregate marks is 75 percent and above. Distinction will not be awarded for candidates passing the examination in more than one attempt.
2. Number of Candidates per day : The maximum number of candidates for practical/clinical and viva-voce examination for degree course shall be upto 8 per day.



# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN ANAESTHESIOLOGY**

## **Preamble**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate specialist having undergone the required training in anesthesiology should be able to recognize the health needs of the community. He or she should be competent to handle effectively medical problems and should be aware of the recent advances pertaining to his/her specialty. She/he should be highly competent anesthesiologist with broad range of skills that will enable him/her to practice anesthesiology independently. The PG student should also acquire the basic skills in teaching of medical/para-medical students. She/he is also expected to know the principles of research methodology and modes of consulting library. She/he should attend conferences, workshops and CMEs regularly to upgrade his/her knowledge.

The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

## **SUBJECT SPECIFIC LEARNING OBJECTIVES**

The training should have clear objective, is competency based, is well planned & evaluated, is supervised and delivered by well trained teachers. It will have special emphasis on attitude and behavior, safety, communication, presentation, audit, teaching, ethics and law and management.

No limit can be fixed and on the number of topics that can be prescribed as course contents. The student is expected to know his/her subject in depth from various text books and journals; however more emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competency in anaesthesia skills commensurate with the specialty (actual hand on training) must be ensured.

- 1. Theoretical knowledge:** The student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology, Pharmacology, Statistics and Physics) as applied to Anaesthesia. The student should acquire in-depth knowledge including recent advances. He/she should be fully conversant with the bedside procedures (diagnostic and therapeutic) and have knowledge of latest diagnostics and therapeutics procedures available including radiological methods.
- 2. Teaching:** The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students. The student should be familiar with the latest teaching (computer and power point presentation) modes including simulators training and evidence based medical education.
- 3. Attitude development:** The student should develop attitude that leads to appropriate communication with colleagues to function in a group in Operating Room /Intensive Care Unit, and develop the ability to function as a leader in the operating room.

## **SUBJECT SPECIFIC COMPETENCIES**

**The student during the training programme, should acquire the following competencies:**

### **A. Cognitive domain**

- Demonstrate knowledge of Anatomy related to;
  - ❖ Diaphragm, upper and lower airway, heart and coronary circulation ,
  - ❖ Regional anaesthesia - field block, central neuraxial, blockade, block for acute pain states
  - ❖ Procedures like -Intramuscular injections, arterial and venous cannulations and
  - ❖ Patient Positioning under anaesthesia
- Demonstrate knowledge of Physiology of various systems (respiratory, cardiovascular, hepatobiliary, renal, endocrine, pregnancy, haematological, neuromuscular, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP, central, autonomic and peripheral nervous systems, metabolic response to stress and trauma) in detail and translate its application in a problem solving manner.
- Demonstrate knowledge of Biochemistry relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
- Demonstrate knowledge of commonly used drugs in anaesthesia practice

(premedication, induction agents - intra-venous and inhalational, neuromuscular blocking agents and reversal of muscle relaxants) - general principles, concepts of pharmacokinetics and pharmacodynamics, drug interactions with the other drugs taken concomitantly by the patient and anaphylactoid reactions.

- Demonstrate knowledge of gas laws, medical gas supply system, fluidics, electricity, diathermy and oxygen therapy.
- Demonstrate knowledge of 'principles of physics' that govern functions of basic anaesthesia delivery equipment, airway devices - (laryngoscopes, airways etc), breathing systems and monitors, fiber optics, Lasers, Pacemakers and defibrillators, monitoring equipments (used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block), Sterilization of equipments, manufacture, filling and transport of gases and liquid oxygen. etc.
- Demonstrate knowledge of importance of pre-anaesthetic assessment and optimization of a patient; consisting of evaluation, interpretation of laboratory investigation as applied to the care of the patients in planning and conduct of general anaesthesia.
- Demonstrate knowledge of basic life support, advanced cardiac, trauma life support, and neonatal resuscitation according to latest guidelines.
- Demonstrate knowledge of principles of sterilization and universal precautions, selection, maintenance and sterilization of anaesthesia and related equipment, Infection control, cross contamination in OT and ICU. Immune response and anaesthesia.
- Describe the development and history of anaesthesia as a specialty with knowledge of important personalities who have contributed towards it.
- Demonstrate knowledge of principles of artificial ventilation, management of unconscious patients, oxygen therapy, shock- (pathophysiology and management) and various protocols related to Intensive Care Unit.
- Demonstrate knowledge of post-operative care in the post-anaesthesia recovery room, in terms of management of
  - ❖ Post-operative pain: various modalities
  - ❖ Nausea and vomiting
  - ❖ Identified emergencies and postoperative complications.
  - ❖ Special precautions to be taken in specific surgical patients.
- Demonstrate knowledge of acute pain management, chronic pain therapy & therapeutic nerve blocks, acupuncture, acupressure and other non-conventional methods of treatment.
- Describe documentation, medico-legal aspects of anaesthesia and concept

of informed consent.

- Demonstrate knowledge of research methodology and basics of biostatistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
- Demonstrate ability to interpret blood gas analysis and other relevant biochemical values, various function tests and basics of measurement techniques and ECG.
- Explain blood coagulation mechanism and their disturbances, rational use of blood and blood components.
- Demonstrate knowledge pertaining to special anaesthetic techniques as relevant to:
  - ❖ Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
  - ❖ Associated medical disorders in surgical patients
  - ❖ Geriatric and pediatric anaesthesia, Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
  - ❖ Induced hypothermia, incidental and environmental safety of patient.
  - ❖ Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises.
  - ❖ Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
  - ❖ Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
  - ❖ Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator, Multiple organ failure
- Demonstrate knowledge pertaining to care of terminally ill, Hospices management, do not resuscitate orders.
- Demonstrate knowledge of general principles of medical audit and Critical incident reporting.
- Demonstrate knowledge of Ethics and clinical trial.
- Demonstrate knowledge of Hospital, ICU and OT design and planning.
- Demonstrate knowledge of Medical education including evidence based medical education.
- Demonstrate knowledge of principles of human resources and material management.
- Demonstrate the knowledge pertaining to Artificial intelligence in

anaesthesia.

- Demonstrate knowledge of fetal surgery & anaesthesia
- Demonstrate knowledge of anaesthesia for robotic surgery
- Demonstrate knowledge pertaining to basics of ultrasonography (USG)
- Demonstrate knowledge of point of care ultrasonography (USG) for anaesthesiologist (POCUS)
- Demonstrate knowledge of inter and intrahospital transfer of the critically ill patient.
- Demonstrate knowledge of anaesthesia for modified ECT

## **B. Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues and interact with the patient and the clinician or other colleagues, able to take appropriate decision making to provide the best possible diagnosis or opinion to aid in optimal patient care.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff and for effective teaching.

## **C. Psychomotor domain**

**At the end of the course, the student should acquire skills in the following broad areas and be able to:**

- Demonstrate ability as a perioperative physician, in terms of
  - ❖ Acquiring mastery in careful and relevant history taking, physical examination in clinical evaluation of the patient preoperatively.
  - ❖ Collecting and synthesizing preoperative data from parent hospital and other sources and to develop a rational strategy for the peri-operative care of the patient.
  - ❖ Thorough and systematic approach to preoperative evaluation of patients with and without systemic diseases, undergoing different types of operations.
  - ❖ Prioritizing problems, present cases clearly and systematically to attending consultants.
  - ❖ Developing working relationships with consultants in other specialties

to assist in preoperative evaluation and get a good consultation.

- ❖ Interacting with preoperative patients and developing effective counseling techniques for different anaesthetic techniques and peri-operative procedures.
  - ❖ Assessing and explaining risk of procedure and taking informed consent.
  - ❖ Managing information in preoperative evaluation and outcome enhancement and communication skill to patients and relatives.
  - ❖ Ability to choose and order the required investigations to be done in a particular patient peri-operatively
- Demonstrate ability in performing
    - ❖ Pre-operative equipment check
      - ❖ selection of drugs
      - ❖ Preparation of work table etc.
  - Identify conditions like difficult airway by following difficult airway algorithms.
  - Demonstrate ability to establish topical airway anaesthesia for awake intubation
  - Demonstrate management of a Failed intubation drill on a Mannequin according to latest guidelines
  - Demonstrate ability to monitor and assess depth of anaesthesia
  - Demonstrate abilities to manage body fluid composition, volume status, replacement of fluid and blood loss, use of whole blood and blood components.
  - Demonstrate abilities to manage electrolyte and acid base derangements, osmolarity and osmolality.
  - Demonstrate acquisition of skills to initiate mechanical ventilation, select appropriate type and mode of ventilator and monitor proper functioning of ventilator.
    - Identify the need to perform intra-operative laboratory tests, blood gases, coagulation profile and interpret the results with clinical co-relation
    - Demonstrate ability to manage co-morbid conditions and anaesthesia
    - Demonstrate ability to perform cannulation of arteries, central and peripheral veins.
    - Demonstrate ability in using and interpreting the following routine non-invasive and invasive monitors intra-operatively:
      - a. Electrocardiogram with ST-segment analysis
      - b. Noninvasive blood pressure
      - c. Capnograph: values and changes in values and waveform.
      - d. Pulse oximetry: values and changes in values
      - e. Neuromuscular blockade monitor
      - f. Invasive arterial pressure: waveform and changes in the waveform

- g. Central venous pressure: values and waveform
- h. Pulmonary artery pressure: values and waveforms, pulmonary capillary wedge tracing.
  - i) Cardiac output
  - ii) Mixed venous oxygen saturation
  - iii) Evoked potential
  - iv) Transesophageal echocardiography: basic understanding
- Demonstrate skills in providing basic life support, advanced cardiac life support, trauma life support and paediatric-neonatal life support, train medical and paramedical staff in BLS, ACLS and ATLS.
- Demonstrate mastery in common procedures like vascular access, use of latest invasive and non-invasive monitoring equipment, lumbar puncture, management of appropriate mechanical ventilation and total care of Intensive Care Patient.
- Demonstrate ability to administer general anaesthesia and regional anaesthesia for ASA I to V, under supervision.
- Demonstrate ability to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision.
- Demonstrate ability to use ultrasound machine for giving blocks and venous cannulation.
- Demonstrate ability to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries, able to manage critically ill patients and treat intractable pain
- Demonstration of following abilities in Simulation Skill Lab
  - Central neuraxial blocks
  - Airway management including endotracheal intubation
  - BLS & ACLS
  - Plexus blocks
  - Peripheral venous access
  - Central venous access
- Demonstration of following abilities in Cadaveric skill lab
  - Anatomy of plexus and major nerves
  - Sono anatomy of plexus of major nerves
  - Front of neck access for airway (FONA)
  - Tracheostomy
  - ICD insertion on cadaver/simulated
  - Demonstrate following abilities in Emergency Anaesthesia, Trauma and Resuscitation:
    - Organize resources in case of mass casualty.
    - Perform triage.
    - Assess, transport and manage mass casualties / disaster

management and camp anaesthesia.

- Manage massive haemorrhage and massive blood transfusion.
  - Transport critically ill patient.
  - Perform anaesthetic management of geriatric patients with fracture neck of femur
  - Manage severe burns patients, rapidly progressing spinal compression, massive haemoptysis and lobectomy, peritonitis from various suspected causes, preparation and management of bowel obstruction, septicemic shock, acute upper airway obstruction such as foreign body, epiglottitis, infections, cardiac tamponade from post cardiac surgery, malignant pericardial effusion, peri-operative management of rupture aneurysm of abdominal aorta
  - Basic Cardiac Life Support and Advanced Cardiac Life Support, Basic Trauma Life Support, Advanced Trauma Life Support, and Cerebral preservation.
  - Management of intra-operative cardiac arrest
  - Management of intra-operative bronchospasm
- Demonstrate ability to document a Medico-legal aspect.
  - Demonstrate ability to provide special sedation /anaesthesia requirements outside operating room eg: Radiology: for CT, MRI (especially in relation to dye allergy and embolization), Onco radiotherapy, Electroconvulsive shock therapy (modified ECT), Non-invasive cardio-radiologic procedures including balloon angioplasty and cardiac catheterization, Non-invasive neuro-radiologic procedures, lithotripsy etc .
  - Demonstrate ability to analyze data and write a thesis, present scientific data, participate in anaesthesia audit.
  - Demonstrate ability to critically review and acquire relevant knowledge from the journals about the new development in the specialty
  - Demonstrate following abilities in the Post Anaesthesia Care Unit (PACU)
    - ❖ Assess the patient's recovery and condition for a safe discharge or transfer.
    - ❖ Observe, recognize and treat the commonly occurring problems likely to arise in the Post-anaesthesia Care Unit (PACU) especially those in relation to cardio-respiratory systems:
      1. Airway integrity and compromise.
      2. Arrhythmia
      3. Hypertension
      4. Hypotension
      5. Pain prevention and pain relief
      6. Nausea and vomiting
      7. Decreased urine output
      8. Emergence delirium



9. Delayed emergence from anaesthesia
10. Shivering
11. Post-obstructive pulmonary edema.

- ❖ Assess patient recovery and the parameters for transfer from the PACU to the ward, ICU, home.
  - ❖ Score the patient's condition according to the Aldrete system, including fast tracking after out-patient surgery.
- Demonstration of following abilities in Intensive Care Unit
    - ❖ Understanding the spectrum of critical illnesses requiring admission to ICU.
    - ❖ Recognizing the critically ill patient who needs intensive care - Trauma, burns, all types of shock, Sepsis, SIRS and ARDS, Poisoning, infectious patient (HIV, Hepatitis) and patients with metabolic disturbances.
    - ❖ Monitoring progress of patients by physiological scoring systems
    - ❖ Practicing infection control practices and control of nosocomial infections.
    - ❖ Inserting central venous lines, arterial lines using ultrasound and interpreting the data.
    - ❖ Managing cardiovascular instability, respiratory failure and postoperative pulmonary complications
    - ❖ Understanding of the operation of mechanical ventilators including different ventilatory modalities non-invasive ventilation, complications and modes of weaning.
    - ❖ Principles and application of Oxygen Therapy
    - ❖ Glycemic control in the critically ill patient
    - ❖ Practice of hypothermia and prevention of cerebral injury after cardiac arrest
    - ❖ Delivering appropriate nutritional support - enteral and parenteral.
    - ❖ Proper use of sedative/hypnotic drugs in the ICU.
    - ❖ Sampling for and interpretation of arterial blood gases (ABG)
    - ❖ Use of PPE (personal protective equipment)
    - ❖ Practicing ethical and legal aspects of critical care
    - ❖ Good communication skills with patient and relatives.
    - ❖ Proper Sterilization of ICU equipment.

- Demonstration of following abilities in Acute and Chronic Pain Management
  - ❖ Assessment of patients with pain including: history taking, physical examination, and interpretation of investigations.
  - ❖ Classify types of pain - acute chronic, traumatic, cancer pain, etc. with the knowledge of Pain pathways in detail.
  - ❖ Practice the different modalities of physical therapy that may relieve both acute and chronic pain
  - ❖ Practice the acute pain, cancer pain guidelines and WHO treatment ladder.
  - ❖ Practice routes of administration and risk/benefits of drugs used for acute and chronic pain relief, patient controlled analgesia and treat the common pain syndromes.
  - ❖ Demonstrate practice of pain management in patients with problem drug use, drug dependency and addiction and identify the parameters for referral to a pain medicine specialist.
- Demonstrate Organization of acute pain service and role of acute pain nurse for pain assessment in various groups of patients, Physiological changes secondary to Pain, practice different modalities of pain control. Pharmacology and side effects of opioid analgesia and non-opioid analgesia, principle of patient-controlled analgesia and assessment of its efficacy, Pharmacology and side effects of epidural/intra-thecal opioid. Neurological assessment of epidural blockade and management of failed block. Management of regional blockade - brachial plexus, para-vertebral and intra-pleural block. Management of epidural abscess. Substance abuse and acute pain control. Pain control in concurrent medical diseases - COAD, IHD, bleeding tendency, geriatric. Pain control in burns patients. Pain control in trauma patients included multiple rib fracture
- Demonstration of abilities to manage Chronic Pain
  - ❖ Practice different modalities of chronic pain management - physical therapy, psychotherapy, (including cognitive behavioural approaches), neuro- ablation, neuro-augmentation, spinal opioid, interventional neuro-blockade, non-opioid analgesia.
  - ❖ Anatomy, indication, technique and complication of chemical sympathectomy (lumbar sympathectomy, stellate ganglion block, celiac plexus block).
  - ❖ Practice principles of management of cancer pain, principle of management of non-cancer neuropathic pain - phantom limb pain, post-herpetic neuralgia, complex regional pain syndrome, trigeminal neuralgia. Principle of management of non-cancer nociceptive pain - myofascial pain, lower back pain, intractable angina, burns, chronic pancreatitis, peripheral vascular diseases.
  - ❖ Practice Epidural steroid injection (all levels) and long-term epidural

catheterization.

- ❖ Observe and practice following blocks: Infra-orbital nerve, Intercostal nerve
- ❖ Recognize complications associated with each blocks and know appropriate treatment of each
- ❖ Know the indications for stimulation techniques such as transcutaneous electrical nerve stimulation (TENS), dorsal column stimulation, and deep brain stimulation.
- ❖ Mechanisms and side effects of other therapies used for treating pain.
- ❖ The principles of pain management in special patient groups including the elderly, children, disabled, intellectually handicapped and those unable to communicate.
- ❖ Awareness of the principles for insertion and management of implantable drug delivery pumps.
- ❖ Awareness of the basic principles of palliative care.

- **Demonstrate practice of Regional Anaesthesia**

- ❖ Applying general principles of pharmacology of local anaesthetics and various adjuvants.
- ❖ Familiarizing with the relevant anatomy for regional techniques.
- ❖ Application of indications and contraindications to regional anesthetic technique including central neuraxial blocks, peripheral nerve blocks and sympathetic nerve blocks.
- ❖ Assessing adequacy of regional anaesthesia and learn techniques of supplementation of inadequate blocks.
- ❖ Providing effective anxiolytics and sedation of patients by both pharmacologic and interpersonal technique.
- ❖ Performing the following regional anaesthesia techniques:
  - Brachial plexus, cervical plexus, stellate ganglion block, lumbar plexus, lumbar sympathetic, Sciatic nerve block, Femoral nerve block, 3 in 1 block, Wrist block, Popliteal Nerve block, Trigeminal nerve block, Retro bulbar blocks, Paravertebral blocks, Intercostal blocks, Caudal block - adult and pediatric, Ankle block, Epidural block/Catheter, Subarachnoid block, Bier's block, all peripheral nerves of the upper and lower limbs.

- **Demonstrate practice of Thoracic Anaesthesia**

- ❖ Pre-operative assessment of patients undergoing Thoracotomy (lung resection), thoracoscopy, video assisted thoracoscopy and mediastinoscopy
- ❖ Various approaches and their relevant equipments for lung isolation.
- ❖ Various double lumen tubes and their placement.
- ❖ Application of Principle of chest drain.

- ❖ Respiratory Physiology and management of one lung ventilation (OLV). Indications, contraindications and hazards of OLV.
- ❖ Application of the knowledge of Anatomy of lung and broncho-pulmonary segments.
- ❖ Anatomy and techniques for intercostals nerve block and thoracic epidural. Management of thoracic epidural anaesthesia and analgesia
- ❖ Anatomy, techniques and placement of paravertebral block/catheter.
- ❖ Post-operative care of patients after lung surgery.
- ❖ Peri-operative management of patients with myasthenia gravis.
- ❖ Peri-operative management of patients with mediastinal mass.
- ❖ Anaesthetic management of mediastinoscopy, major airway stenting.
- ❖ Lung volume reduction surgery and problems.

• **Demonstrate practice of Cardiovascular Anaesthesia:**

- ❖ Application of the knowledge of Anatomy and physiology of valvular disease, coronary arteries and their territories. Pulmonary circulation, coronary circulation, cerebral circulation, visceral circulation.
- ❖ Application of the knowledge of Distribution of blood volume to different organs and systems and their control. Microcirculation. Venous system, venous pressure, its influence on various functions.
- ❖ Regulation of blood pressure, hypotensive anaesthesia.
- ❖ Anatomy and physiology of all operable congenital heart disease like ASD, VSD, PDA, TOF, transposition of great vessels.
- ❖ Application of the knowledge of anatomy and physiology of vascular heart disease like coarctation of aorta.
- ❖ Assessment of cardiac patient with ischaemic heart, valvular heart disease and other diseases listed above. Understanding of cardiac catheterization, echocardiography, stress testing, and radio-nucleide imaging.
- ❖ Application of Principle and complication of cardiopulmonary bypass
- ❖ Application of Principle of trans-esophageal echocardiography
- ❖ Application of Principle of circulatory support: inotropes, IABP, pacing
- ❖ Coagulation and management of coagulopathy.
- ❖ Off pump bypass
- ❖ Intra-operative management of aortic surgery and major peripheral vascular surgery, aneurysm grafts, recanalisation procedures.

- ❖ Understanding of the adult patient with congenital heart disease and their management during anaesthesia.
- ❖ Postoperative cardiac critical care, including cardiovascular problems, analgesia.
- ❖ Insertion of invasive monitoring for arterial monitoring, central venous pressure monitoring, pulmonary artery catheter insertion and interpretation.
- ❖ Robotic cardiac surgery.
- ❖ Temporary pacemaker implantation.
- ❖ Familiarizing bedside use of 2-D ECHO

- **Demonstrate practice of Paediatric Anaesthesia**

- ❖ Application of knowledge of Anatomical changes in paediatric patient and neonates.
- ❖ Application of knowledge of Physiology and pharmacology in paediatric patient.
- ❖ Guideline for pre-operative fasting in children and pre-medication.
- ❖ Anaesthetic equipment: laryngoscopes, airways, endotracheal tubes, LMAs, PLMA and breathing circuit for children.
- ❖ Anaesthesia management for premature and newborn.
- ❖ Emotional problems for parent and child and principles of premedication. Consent by parents and their presence during induction. To become skilled in communicating with children, parents and other relatives.
- ❖ Problems of transporting a sick pediatric patient from the ward to the operating room and back with regard to temperature maintenance, cardiovascular stability, ventilation and oxygenation.
- ❖ Estimate preoperatively blood volume, hourly fluid requirements, fluid deficit, third space loss, acceptable blood loss and apply principles of fluid and blood replacement in the perioperative period.
- ❖ Induce and maintain anaesthesia by inhalation, intravenous, intramuscular and rectal routes and monitor pediatric patients.
- ❖ Understand the benefits, risks and techniques of regional anaesthesia in children. Anatomy and techniques of caudal, dorsal penile and inguinal regional block, spinal and epidural block
- ❖ Learn to recognize and treat post anaesthesia complications like apnea, laryngospasm, acid-base and electrolyte disturbances, febrile and convulsing child and bleeding child.
- ❖ Common problems related to common congenital syndromes presenting for surgery. Anaesthetic management of a child with

concurrent disease - Down's, Pierre Robin syndrome, von Willebrand's disease, Goldenhar's, Sturge-Weber, Tracher-Colin, Prune-Belly, and cyanotic and non-cyanotic congenital heart disease.

- ❖ Paediatric resuscitation: drugs, doses and defibrillation of children of all ages, from the very premature neonates to those children with complex coexisting disease.
- ❖ Management of patients requiring paediatric intensive care, ventilatory management, and support of circulation.
- ❖ Resuscitation of neonates and children of all ages. A period of one to two months in a PICU is recommended for all post graduate students undergoing advanced training in paediatric anaesthesia.
- ❖ Paediatric pain management
- ❖ Assessment of a child with URTI, with a heart murmur.
- ❖ Management of fluid and electrolytes in children.
- ❖ Anaesthetic management of a malignant hyperthermia susceptible child.
- ❖ Anaesthetic management of FB bronchus and oesophagus, Wilm's tumour, congenital diaphragmatic hernia, tracheo-oesophagus fistula, thoracotomy.
- ❖ Anaesthesia for Fetal Surgery.
- ❖ Sedation techniques including the selection, management and monitoring of children for diagnostic and therapeutic procedures, with particular attention to working in areas outside the theatre suite.
- **Demonstrate practice of Transplant anaesthesia**
  - ❖ Application of knowledge of basic pathophysiology of renal and liver failure. Principles of anesthetizing an immuno-compromised patient.
  - ❖ Principles of anesthetizing patient with end stage renal/liver disease and patient with organ transplantation. Perioperative management.
- **Demonstrate practice of Neuroanaesthesia**
  - ❖ Application of basic knowledge of cerebral circulation and intra cranial pressure and its implications
  - ❖ Anaesthesia to patients with neurologic disease, head injury undergoing neurologic or non-neurologic surgery and for diagnostic procedures requiring anaesthesia.
  - ❖ Anesthetic implications of the most common neurosurgical procedures, transnasal, trans-sphenoidal pituitary surgery. Posterior fossa surgery. Surgery for supratentorial pathology.
  - ❖ Application of basic concepts behind electrophysiologic monitoring of the brain and spinal cord.
  - ❖ Application of knowledge of general principles of positioning the patient for surgery and the advantages and disadvantages of each position.

- ❖ Effects of anaesthesia on the electroencephalogram (EEG) and evoked potentials.
- ❖ Differential diagnoses and treatment alternatives of intraoperative intracranial hypertension (“tight brain”)
- ❖ Management of Head Trauma, and its anesthetic management and various protocols regarding their management and associated trauma.
- ❖ Intracranial surgery and spinal surgery, both routine and emergency.
- ❖ Monitoring: techniques for detection and management of air embolism.
- ❖ Lumbar puncture and CSF drainage.
- ❖ Non-surgical management of the head trauma patient, Systemic complications of severe brain injury.
- ❖ Management of subarachnoid haemorrhage and vasospasm.
- ❖ Diagnosis and management of patients with brainstem death and dealing with patient’s relatives
- ❖ Monitoring ICP & depth of anaesthesia.

- The following are special procedures which the post graduate student must be able to perform

Sr. No.	Name of procedure
1.	Blind Nasal intubation
2.	Failed intubation drill (includes Fiberoptic Laryngo/ Bronchoscope)
3.	Double Lumen Tube insertion
4.	Bronchial Blocker placement
5	Jet Ventilation
6.	Suctioning and physiotherapy of wet lung
7.	Intubation in Neonates
8.	Initiation and management of ventilation
9.	Combined Spinal Epidural
10.	Brachial Plexus Block
11.	Intravenous Regional Anaesthesia
12.	Elbow, Wrist, Digital, Sciatic, Femoral, Lateral Cutaneous Nerve of thigh, Ankle, etc.
13	Cervical-Superficial and Deep, Stellate, Splanchnic.
14.	Central Venous Line by Brachial, Jugular and Subclavian veins
15.	Radial and Femoral Artery cannulation
16.	CVP monitoring
17.	Pulmonary Capillary Wedge Pressure
18.	Neuro-muscular transmission Monitoring
19.	Anaesthetic Depth eg. BIS monitoring
20.	Transcutaneous cricothyroidotomy.
21.	Awake intubation

- Demonstration of anesthetic abilities in the intraoperative period keeping into consideration the specific requirement of the surgical procedure - ENT, Orthopaedic, Gynaecology - Obstetrics, General surgery, Onchosurgery, replacement surgeries, urosurgery, vascular, plastic, Thoracic, Dental etc

### **Suggested Time Frame for Training the PG Students:**

The student should be taught as per the following schedule to acquire the skills:

#### **1. First 6 months:**

- During the first 6 months, the student should be taught expertise in the management of uncomplicated cases not belonging to any super specialty (ASA I and II cases). To start with, the student will observe and slowly become independent in giving general anaesthesia and spinal anaesthesia to ASA I and II cases for minor and major surgery, under graded supervision.
- The postgraduate student should learn the basic principles of safe and



effective anaesthesia, resuscitation, and both the prevention and treatment of pain, perioperative care of the surgical patient, care of handling equipments, basic techniques in anaesthesia, and anaesthetic pharmacology, and electrical safety.

- He/she should select the thesis topic and submit the protocol for his thesis.

## **2. Next 18 months**

- The student should widen his experience and should be able to undertake anaesthetic care of all routine cases, assist in the anaesthetic care for routine obstetric practice, understand basic principles of critical care, pain management, and participate in audit.
- The student should be trained in administration of general anaesthesia and regional anaesthesia for ASA I to V under supervision. The student should be able to give extradural block (EDB) lumbar and thoracic, Spinal Block, and Peripheral Nerve Blocks under supervision, and use of Ultrasound machine for giving blocks and venous cannulation. The student should learn paediatric and trauma life supports and maintain skills for basic and advanced cardiac life support.
- It is advised that they should be posted in the following specialties: general surgery including gastrointestinal surgery, transplant, ENT, Urology, Obstetrics, Dental Surgery, Eye, ICU, Pain Clinic and peripheral theatres like ECT, radiodiagnostic and therapeutic procedures (CT scan, MRI scan, angiography).
- The student should be able to analyze data and write a thesis. He/she should be able to present scientific data.

## **3. Last 12 months**

- Thesis should be submitted minimum of 6 months before the final MD examination.
- The post graduate student should be given experience of various super-specialties like cardiothoracic and vascular surgery, neurosurgery and transplantation, and paediatric surgery. The student should be able to plan and administer anaesthesia to all emergency patients under supervision including patients for Cardiac, Neurosurgery, Pediatric surgery, and for all major surgeries. The aim at the end is to be competent and independent soon after the third year of junior residency in providing anaesthesia to elective and emergency cases.
- The post graduate student should be able to manage critically ill patients and treat intractable pain. They should also know how to organize resources in case of mass casualty. The curriculum should be able to provide 04 months of elective Intensive Care Unit posting (2 months during initial years under supervision and 2 months independently in the last six months).

**4. At the end of 3 years, the post graduate student should have the skills to:**

- Plan and conduct anaesthesia and provide post-operative care including pain relief for elective and emergency surgical procedures related to all surgical specialties.
- Carry out basic life support (BLS) and advanced life support (ALS) and train medical and paramedical staff in BLS and ALS.
- Manage patients admitted to an intensive care unit with the help of latest equipment.
- Manage patients suffering from acute and chronic intractable pain.
- Organize the hospital environment to manage mass casualty situation and camp anaesthesia.
- Critically review and acquire relevant knowledge from the journals about the new development in the specialty.
- Should be able to participate in anaesthesia audit.

Overall the student should acquire skills in the following practical competencies:

- ❖ Information management in preoperative evaluation and outcome enhancement and communication skill to patient and relatives.

## **Syllabus**

The course content of 1<sup>st</sup> year should cover the following:

**1. Anatomy related to:**

- Diaphragm, upper and lower airway
- Regional anaesthesia, field block, central neuraxial, blockade, block for acute pain states
- Intramuscular injections, arterial and venous cannulations and positioning.

**2. Physics related to:**

- Anaesthesia machine - assembly of necessary items.
- Airway equipment including laryngoscopes, airway devices
- Breathing systems
- Monitoring in anaesthesia with concepts of minimum monitoring
- Gas laws, medical gas supply system
- Fluidics
- Electricity and diathermy
- Oxygen therapy

### 3. Physiology related to:

- Theories of anaesthesia
- Respiratory, cardiovascular, hepatobiliary, renal and endocrine system, pregnancy, blood, muscle and N-M junction, Nerve impulse transmission, ECG, regulation of temperature and metabolism, stress response, cerebral blood flow and ICP.
- Central, autonomic and peripheral nervous systems.
- Metabolic response to stress and trauma.

### 4. Pharmacology related to

- General principles, concepts of pharmacokinetics and pharmacodynamics
  - Drug interactions in anaesthesiology, anaphylactoid reactions
  - Drugs used for premedication, induction of anaesthesia, general anaesthetics- intra-venous and inhalational, neuromuscular block and reversal of muscle relaxants.
5. **Biochemistry** relevant to fluid balance and blood transfusion, perioperative fluid therapy, acid base homeostasis in health and diseases.
  6. Theoretical background of the commonly used anaesthetic techniques of general and regional anaesthesia, general principles of pre-anesthetic assessment and medication, recovery from anaesthesia and post-operative care, effects of positioning during anaesthesia.
  7. Introduction to the operation theatre, post-anaesthesia care rooms
  8. Introduction to acute, chronic pain and pain management.
  9. Documentation and medico-legal aspects of anaesthesia. Defensive anaesthesia. Concept of informed consent.
  10. Resuscitation - basic and advanced life support (cardiac and trauma life support), neonatal resuscitation.
  11. Intensive care of critical patients with introduction to artificial ventilation, management of unconscious patients, oxygen therapy, shock - pathophysiology and management.
  12. Introduction to Research methodology, basics of biostatistics.

The course content of **2<sup>nd</sup> year** should cover the following:

Anatomy related to blocks for chronic pain, chemical neurolysis and different organ systems.

### 1. Physics related to:

- equipments used in anaesthesia monitors, ventilators, vaporizers,
- Fiberoptics.

- Laser
  - Pacemaker and defibrillator
  - Monitoring equipment used for assessment of cardiac functions, temperature, respiratory functions, blood gases, intracranial pressure, depth of anaesthesia and neuromuscular block.
  - Sterilization of equipment
  - Computers in anaesthesia
2. Pharmacology of drugs used in cardiovascular, respiratory, endocrine, renal diseases and CNS disorders.
  3. Interpretation of blood gases and other relevant biochemical values, various function tests and basics of measurement techniques, ECG.
  4. Blood coagulation mechanism, disturbances, blood components.
  5. Special anaesthetic techniques as relevant to -
    - Outpatient anaesthesia, hypotensive anaesthesia, anaesthesia in abnormal environments including rural area and calamitous situations
    - Associated medical disorders in surgical patients
  6. Geriatric and pediatric anaesthesia
  7. Emergency, ENT, orthopedic, ophthalmology, obstetrics, dental, radio-diagnosis and radiotherapy.
  8. Medical statistics relevant to data collection, analysis, record keeping in anaesthesia, comparison and estimation of significance.
  9. Care of terminally ill, Hospices management. Do not resuscitate orders.
  10. Postures and anaesthesia.
  11. Induced hypothermia, incidental and environmental safety of patient.
  12. Malignant hyperthermia, myasthenia gravis, GB syndrome and other neuromuscular diseases, obesity, COPD, Diabetes mellitus, bronchial asthma and hypertensive crises..
  13. Third world anaesthesia.
  14. Inherited metabolic diseases and anaesthesia.

The course contents of 3<sup>rd</sup> year should cover the following:

1. Principles of anaesthetic management of neuro/cardiac/thoracic/vascular/ transplantation/burns and plastic surgery.
2. Anaesthesia for patients with severe cardiac, respiratory, renal and hepatobiliary disorder posted for unrelated surgery
3. Shock, types, pathogenesis and management of patients in shock, renal failure, critically ill and/or on ventilator.

4. Multiple organ failure
5. Infection control, cross contamination in OT and ICU.
6. Immune response and anaesthesia.
7. Concept of cytokines, and other enzymes.
8. Selection, maintenance and sterilization of anaesthesia and related equipment
9. Chronic pain therapy and therapeutic nerve blocks.
10. Acupuncture, acupressure and other non-conventional methods of treatment.
11. Principles of neonatal resuscitation, ventilation and critical care.
12. Principles of human resources and material management.
13. General principles of medical audit. Critical incident reporting
14. Ethics and clinical trial.
15. Hospital, ICU and OT design and planning.
16. Medical education including evidence based medical education.

## **TEACHING AND LEARNING METHODS**

### **Postgraduate Training**

#### **Teaching methodology**

Didactic lectures are of least importance.

- Teaching should include seminars, journal clubs, symposia, tutorials, case discussions, Flip class, Case based discussions, Simulation based training and research presentations.
- Reviews and guest lectures should get priority for theoretical knowledge.
- Bedside teaching, grand rounds, interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning.
- Student should have hands-on training in performing various procedures (medical/surgical concerning his specialty) and ability to interpret various tests/investigations.
- Exposure to newer specialized diagnostic/therapeutic procedures concerning his/her subject should be given.
- A postgraduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.
- Log books shall be maintained regularly and should be checked and assessed periodically by the faculty members imparting the training.
- The postgraduate students shall be required to participate in the teaching

and training programme of undergraduate students and interns.

- Department should encourage e-learning activities.

### **Thesis: Supervision**

- The postgraduate is responsible to a Faculty member and the latter should be available to advise and assist the student in his clinical assignments
- Departmental teaching committee will be responsible for the educational activities of the department and the teaching schedule.
- This involves providing services for emergencies and it makes different demands upon the anaesthesiologist. It should be learned through experience, with reduced staff. The clinical work during emergency should have a close supervision. The standards should be maintained of the agreed competence on schedule. The emergency duties should be properly arranged with duty off. The postgraduates may have to do emergency duty as per schedule

**During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of skills laboratories in medical colleges is mandatory.**

### **Simulators:**

Simulators should be used for the events of high importance but infrequent occurrence and where there may be high risks to the patients. The simulators can also be used for assessment purposes.

### **Rotation:**

#### **Schedule for three years of MD Anaesthesia postings:**

The post graduate student should be exposed to the following areas of clinical anaesthesia practice:

1. Pre-anaesthesia clinic
2. Pain clinic
3. Recovery and Post anaesthesia Care Unit ( PACU )
4. Intensive Care Units
5. Dialysis and transplant
6. All specialty theatres
7. Peripheral areas: Radiology, MRI, ECT and other interventional laboratories

The suggested schedule of the Operating Theatre can be as follows: This may change as per availability of specialities.

Operation theatre	Months
General Surgery	6
Urology	1
Ophthalmology	1
Otorhinology	2
Dental	1
Orthopedics/Trauma/casualty	3
Gynecology	3
Obstetrics	3
Pediatrics surgery	2
Burns/Plastic	1
CTVS	2
Neurosurgery	2
ICU	4
Pain	1
Recovery	1
Organ Transplant, posting in other areas (Radiology, Radiotherapy, ECT, Cardiac Cathlab)	3

## **ASSESSMENT**

**FORMATIVE ASSESSMENT**, during the training programme

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

Formative assessment will be done yearly both theory and practicals. Theory will include four papers with ten questions and ten marks each. Practical will be conducted through OSCE by DOPS and mini CEX.

Oral/Viva-voce should be conducted preferably on four tables with one examiner on each table

### **General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination. The thesis is assessed separately.

**Quarterly assessment during the MD training should be based on:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)

**SUMMATIVE ASSESSMENT** i.e, assessment at the end of training

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS 29<sup>th</sup> December 2023.  
**Post graduate Examination**

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D. shall be held at the end of 3rd academic year.



An academic term shall mean six month's training period.

The final examination consists of three parts:

- 1) Eligibility criteria for appearing university examination.
- 2) Theory evaluation
- 3) Practical/Clinical and Oral evaluation

## **1. Eligibility criteria for appearing university examination.**

### **A. Thesis**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the all the examiners before the conduct of University Examination.

- B. Have minimum one paper presentation or podium presentation at a National / Zonal / State Conference of his/her specialty.
- C. Have minimum one Research paper published in Journal of his / her specialty as first author.
- D. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
- E. Complete a certificate course in ethics in Good clinical practices in the first year of the course conducted by the institution.
- F. Complete a certificate course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and dissertation is

accepted.

2. **Theory** consists of four papers of 3 hours each having 10 short structured questions with 10 marks each:

**Paper I:** Basic Sciences as applied to Anaesthesiology

**Paper II:** Practice of Anaesthesia: Anaesthesia in relation to associated systemic and medical diseases.

**Paper III:** Anaesthesia in relation to subspecialties/superspecialties

**Paper IV:** Intensive Care Medicine, Pain Medicine and Recent advances.

**Total marks for theory papers will be 400.**

**Passing minimum for theory will be 200/400 (40% minimum in each paper)**

3. **Practical/Clinical Examination: Total marks for practicals will be 300.**

A. Dissertation 20 marks.

B. OSPE 5 STATIONS 25 Marks (5 stations X 5 marks)

C. Case Presentations:

Long case: One, duration 30 min (history, examination, Diagnosis and Management, Discussion) 100 marks

Short cases: Two, 15 minutes each for short case. In short cases only relevant history important to anaesthesia to be taken (history, clinical examination and diagnosis, discussion). 2 X 40 = 80 marks

D. Subject Specific Assessment: Clinical Case/ Problem Based Discussion 75 marks

**Oral/Viva-voce 100 marks**

Conducted preferably on four tables with one examiner on each table:

Table one: ECG, X-rays, ABG Cards, Pulmonary function tests, Capnographs, clinical exercises card.

Table two: Anaesthetic Drugs, Emergency Drugs, IV Fluids, Nerve Blocks (skeleton).

Table three: Anaesthesia machine including circuits and Vaporizers, ETT, Supraglottic Airway devices, ICU Ventilator and oxygen therapy equipment.

Table four: Resuscitation equipments, resuscitation demonstration, Difficult Airway Equipment, monitoring equipments.

The university shall conduct not more than 2 examinations in a year, with an interval of not less than 4 and not more than 8 months between the two examinations.

### **Recommended Reading Books (latest edition)**

1. Lee's Synopsis of Anaesthesia
2. Clinical Anesthesiology by Morgan
3. Cardiac Anaesthesia By Joel Kaplan
4. Clinical Anaesthesia by Barash, Cullen and Stoelting
5. Textbook of Anaesthesia by Aitkenhead Rowbotham and Smith
6. Anaesthesia for neonates and infants by Smith
7. Pharmacology and Physiology for Anaesthetists by Stoelting
8. Principles of Obstetric Anaesthesia by Craford
9. Miller's Anesthesia
10. Stoelting RK, Miller RD Basics of Anaesthesia
11. ICU Book, Paul Marino
12. Text Book of Critical Care, by Fink et al
13. Regional Anaesthesia, P Prithviraj
14. Practical Management of Pain, Raj
15. Stoelting and Dierdorf: Anaesthesia and Co-existing Disease
16. Dorsch and Dorsch: Understanding Anaesthesia Equipments
17. ECG by Shamroth/Goldman
18. Anatomy for Anaesthetists by Harold Ellis
19. Clinical Anesthesia by P.G.Barash
20. Longneckers Anaesthesiology- Mcgraw Hill

### **Must refer:**

1. Cucchiara and Michenfelder: Clinical Neuroanaesthesia
2. Cottrell and Smith: Anaesthesia and Neurosurgery
3. Complications in Anaesthesiology by Orkin
4. Complications in Anaesthesia by Raven
5. Airway management by JL Benumof
6. Obstetric Anaesthesia by Chestnut

### **Journals**

03 International Journals and 02 national (all indexed) journals

Annexure I

Postgraduate Students Appraisal  
Form Pre / Para /Clinical  
Disciplines

Name of the Department/Unit :

Name of the PG Student :

Period of Training : FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Journal based /recent advances learning				
2.	Patient based /Laboratory or Skill based learning				
3.	Self-directed learning and teaching				
4.	Departmental and interdepartmental learning activity				
5.	External and Outreach Activities / CMEs				
6.	Thesis / Research work				
7.	Log Book Maintenance				

Publications Yes/ No

Remarks\*  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE  
HOD

SIGNATURE OF CONSULTANT

SIGNATURE OF

## **POST GRADUATE DEGREE COURSE**

### **M.D IN**

### **DERMATOLOGY, VENEREOLOGY AND LEPROSY**

#### **PREAMBLE:**

The course of the postgraduate students in Dermatology, Venereology and Leprosy is to impart knowledge and skills that may enable them to diagnose and treat common and rare diseases, complications of skin diseases and their unusual manifestations. The student should also be aware of the recent advances in the speciality.

They should also be able to:

- Should be able to recognize health needs of community.
- Practice efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude, maintaining high ethical standards.
- Continue to evince keen interest in continuing medical education in the specialty, irrespective of whether he/she is in a teaching institution or a practicing specialist.
- Be a motivated 'teacher' – defined as a specialist keen to share his/her knowledge and skills with a colleague or a junior or any learner.

#### **SUBJECT SPECIFIC OBJECTIVES**

1. Student should have knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to dermatology. The student should acquire in-depth knowledge of his subject including recent advances.

The student should be fully conversant with the bedside procedures (diagnostic and Therapeutic) and having knowledge of latest diagnostics and therapeutics available.

2. Student should have acquired practical and procedural skills related to the subject.

3. Critically evaluate, initiate investigation and clinically manage cases in Dermatology, Venereology and Leprosy with the help of relevant investigations.

4. Should plan and advise measures for the prevention and rehabilitation of patients with Various dermatological conditions.

5. Able to ensure the implementation of National Health Programmes, particularly in Sexually transmitted diseases (STD) and leprosy.

6. Acquire training skills in research methodology, professionalism, attitude and Communication skills, as below:

- Student must know basic concepts of research methodology, plan a research Project, consult library and online resources, has basic knowledge of statistics And can evaluate published studies.
- Should be able to practice the specialty of dermatology ethically.
- Recognize the health needs of patients and carry out professional obligations in Keeping with principles of National Health Policy and professional ethics.

7. Teaching skills in the subject

- Student should learn the basic methodology of teaching and develop

Competence in teaching medical/paramedical students.

8. Should have acquired Problem Solving skills

9. Fully conversant with bedside procedures

## ***SUBJECT SPECIFIC COMPETENCIES***

**By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:**

### **A. Cognitive domain**

**At the end of the course, the student should have acquired following theoretical competencies:**

- Describe structure, functions and development of human skin.
- Describe ultrastructural aspects of epidermis, epidermal appendages, dermo-epidermal junction, dermis, and sub-cutis.
- Describe basic pathologic patterns and reactions of skin.
- Demonstrate the knowledge of common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immunofluorescence, immunoperoxidase and other related techniques.
- Describe the basics of cutaneous bacteriology, mycology, virology, parasitology and host resistance.
- Describe papulosquamous and vesiculobullous disorders.
- Describe disorders of epidermal appendages and related disorders.
- Describe inflammatory and neoplastic disorders of dermis.
- Describe skin lesions in nutritional, metabolic and heritable disorders.
- Describe pharmacokinetics and principles of topical and systemic therapy.
- Describe drug reaction, its diagnosis and management.
- Describe cutaneous manifestations of systemic disorders.
- Describe anatomy of male and female genitalia, epidemiological transmission, clinical aspects and management of STDs and HIV.
- Describe clinical features, reactions, treatment and rehabilitation in leprosy.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problems in dermatology including emergencies in adults and children.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion in dermatological conditions.
- Describe common dermatological malignancies in the country and their management including prevention.
- Should be expert in evaluation of ECG, chest X-ray (CXR), biochemical, haematology and immunology reports related to dermatology.

- Acquire knowledge of common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immuno-fluorescence, immuno-peroxidase and other related techniques.
- Acquire knowledge of the basics of laser operation and precautions which needs to be taken. Demonstrate competence in basic concepts of research methodology and interpretation of data in medical literature/publications.

Skilled as a self-directed learner, recognize continuing educational needs; use appropriate learning resources and critically analyze relevant published literature in order to practice evidence-based dermatology;

- Should also have a broad idea how to approach an uncommon dermatological disease.

## B. Affective Domain

**At the end of the course, the student should have acquired the following attitudinal competencies:**

- Demonstrate self-awareness and personal development in routine conduct
- **Behavior and Emotional Stability:** Dependable, disciplined, dedicated, stable in emergency situations and shows positive approach.
- **Motivation and Initiative:** Is innovative, enterprising, does not shirk duties or leave any work pending and motivates team members.
- **Honesty and Integrity:** Is truthful, admits mistakes, does not cook up information, has ethical conduct and exhibits good moral values.
- **Interpersonal Skills and Leadership Quality:** Has compassionate attitude towards patients and attendants, gets on well with colleagues and paramedical staff, is respectful to seniors, has good communication skills.
- Should be able to maintain confidentiality with regards to history, physical examination and management of patients.
- Identify social, economic, environmental, biological and emotional determinants of patients, and institute diagnostic, therapeutic, rehabilitative, preventive and promotive
- Measures to provide holistic care to patients at individual and community level against skin, venereal disease and leprosy.
- Recognize the emotional and behavioral characteristics of patients and keep these fundamental attributes in focus while dealing with them.
- Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities.
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities.
  - Organize and supervise the desired managerial and leadership skills.
  - Should be able to function as a part of a team, develop an attitude of cooperation with
- colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with

- patients, relatives and other health personnel and to respect the rights of the patient
- including the right to information and second opinion.

### **C. Psychomotor Domain**

**A student at the end of training of 3 years of MD programme, must acquire the following practical skills:**

- General medical skills as learnt in MBBS to be maintained:
- Should be expert in blood pressure measurement, intravenous access, blood sampling, fluid electrolytes therapy, pleural and cerebrospinal; fluid (CSF) fluid examination.
- Should be able to provide basic and advanced life-saving support services in emergency situations.
- Should be able to undertake complete monitoring of the patient and identify social economic, environmental and emotional determinants in a given case and take them into account for planning therapeutic measures
- Recognize conditions that may be outside the area of his specialty/competence and refer them to the proper specialist.

### **Dermatology, Venereology and Leprosy, HIV/AIDS Skills**

**The student should:**

- Acquire skills in history taking, physical examination, diagnosis and management of
- patients in dermatology, venereology and leprosy.
- Be able to identify, classify and differentiate cutaneous findings in dermatological
- terms in a systematic way.
- Be able to perform systemic examination (chest, cardiac, abdomen, neurological,
- genitals, oral, eye and gynecological examination) relevant to dermatologic condition.
- Be competent to manage dermatologic emergencies like angioedema, toxic epidermal
- necrolysis (TEN), Stevens-Johnson syndrome (SJS), pemphigus, drug reaction and
- necrotic erythema nodosum leprosum (ENL).
- Be able to plan and deliver comprehensive treatment for diseases using principles of
- rational drug therapy.
- Be able to plan and advice measures for the prevention of infectious disease.
- Be able to plan rehabilitation of patient suffering from chronic illness and disability
- and those with special needs like leprosy.
- Demonstrate skills in documentation of case details and of morbidity/mortality data
- relevant to the assigned situation.



## Laboratory Skills

### The student:

- Should be able to perform common laboratory procedures like potassium hydroxide
- (KOH) mount, Gram stain, Giemsa stain, acid fast bacilli (AFB) stain, Woods lamp
- examination, stains, culture media etc. related to the cutaneous diagnosis
- independently.
- Should be able to order relevant investigations and interpret them to reach to a
- diagnosis.
- Should be familiar with other recent investigations.

### Dermatopathology - Student should be competent enough to:

- To interpret histopathology of common skin diseases.
- To diagnose common skin diseases by examining slides under microscope.

## Surgery in dermatology

### At the end of training following skills should be performed independently by the student:

1. Should be able to give incisions, take stitches and sutures.
2. Should be trained in taking skin biopsy and nail biopsy.
3. Should be able to perform chemical peels, manual dermabrasion, skin punch grafting and wound dressing independently.
4. Should be able to perform cryosurgery, nail surgery and acne surgery.
5. Able to perform chemical cauterization, cryotherapy, patch and photopatch test, slit smears and tissue smears.

## Venereology

1. Should be competent in the clinical approach to the patient of STDs and HIV/AIDS.
2. Should be able to interpret the histopathological diagnosis including laboratory aids related with venereology.
3. Able to perform dark ground illumination, gram stain, Bubo aspiration and tissue smear.
4. Able to manage the patient according to syndromic approach for treatment of STDs.

## Leprosy

### The student should be:

1. Able to diagnose and approach the case of leprosy.
  2. Perform AFB smear.
  3. Able to manage cases of lepra reaction.
- Identify, judge and decide when to refer the patients at appropriate level for

surgery or rehabilitation. Should be able to manage pediatric cases with skin diseases.

# Syllabus

## Course contents

### Topics related to allied basic sciences

- The structure, functions and development of human skin.
- Ultrastructural aspects of epidermis, epidermal appendages, dermo-epidermal junction, dermis, and sub-cutis.
- Immunology, molecular biology and genetics in relation to the skin.
- Epidermal cell kinetics and keratinization.
- Lipids of epidermis and sebaceous glands.
- Percutaneous absorption.
- Skin as an organ of protection and thermoregulation.
- Biology of eccrine and apocrine sweat glands.
- Biology of melanocytes and melanin formation.
- Biology of hair follicles, sebaceous glands and nails.
- Epidermal proteins.
- Dermal connective tissue: collagen, elastin, reticulin, basement membrane and ground substance.
- Metabolism of carbohydrates, proteins, fats and steroids by the skin.
- Cutaneous vasculature and vascular reactions.
- Mechanism of cutaneous wound healing.
- Cellular and molecular biology of cutaneous inflammation and arachidonic acid metabolism.
- Immunologic aspects of epidermis.
- Human leukocyte antigen (HLA) system.
- Immunoglobulins.
- Cytokines and chemokines.
- Lymphocytes, neutrophils, eosinophils, basophils and mast cells.
- Complement system.
- Hypersensitivity and allergy.
- Cutaneous carcinogenesis (chemical, viral and radiation).
- Basics of cutaneous bacteriology, mycology, virology, parasitology and host resistance.

- Common laboratory procedures, stains, culture media etc. related to the cutaneous diagnosis.
- Basic pathologic patterns and reactions of skin.
- Common laboratory stains and procedures used in the histopathologic diagnosis of skin diseases and special techniques such as immunofluorescence, immunoperoxidase and other related techniques.
- 

## **Clinical dermatology**

- Epidemiology of cutaneous disease.
- Psychologic aspects of skin disease and psycho-cutaneous disorders.
- Pathophysiology and clinical aspects of pruritus.

## **Papulosquamous diseases**

- Psoriasis, pityriasis rubra pilaris, pityriasis rosea.
- Parapsoriasis, lichen planus, lichen nitidus.
- Palmo-plantar keratodermas, Darier's disease, porokeratosis.
- Ichthyoses and ichthyosiform dermatoses.
- Kyrle's disease and other perforating disorders.

## **Vesiculo - bullous disorders**

- Erythema multiforme, Stevens-Johnson syndrome, Toxic epidermal necrolysis.
- Bullous pemphigoid, Pemphigus.
- Chronic bullous disease of childhood.
- Herpes gestationis (pemphigoid gestationis).
- Hereditary epidermolysis bullosa.
- Epidermolysis bullosa acquisita.
- Dermatitis herpetiformis.
- Familial benign pemphigus.

## **Disorders of epidermal appendages and related disorders**

- Disorders of hair and nails.
- Disorders of sebaceous glands.
- Rosacea, Perioral dermatitis, acne.
- Disorders of eccrine and apocrine sweat glands.
- Follicular syndromes with inflammation and atrophy.

## **Epidermal and appendageal tumours**

- Precancerous lesions, squamous cell carcinoma and basal cell carcinoma
- Keratoacanthoma, benign epithelial tumours, appendageal tumours

- Merkel cell carcinoma, Paget's disease

### **Disorders of melanocytes**

- Disorders of pigmentation, albinism, benign neoplasia and hyperplasias of melanocytes, dysplastic melanocytic nevi, cutaneous malignant melanoma.

### **Inflammatory and neoplastic disorders of the dermis**

- Acute febrile neutrophilic dermatosis (Sweet's syndrome)
- Erythema elevatum diutinum
- Cutaneous eosinophilic diseases
- Granuloma faciale
- Pyoderma gangrenosum
- Erythema annulare centrifugum and other figurate erythemas
- Granuloma annulare
- Malignant atrophic papulosis (Dego's Disease)
- Neoplasms, pseudoneoplasms and hyperplasias of the dermis
- Vascular anomalies
- Kaposi's Sarcoma
- Anetoderma and other atrophic disorders of the skin
- Ainhum and pseudoainhum
- Neoplasias and hyperplasias of neural and muscular origin
- Elastosis perforans serpiginosa and reactive perforating collagenosis

### **Lymphomas, pseudolymphomas and**

### **related conditions Disorders of**

### **subcutaneous tissue**

- Panniculitis
- Lipodystrophy
- Neoplasms of the subcutaneous fat

### **Disorders of the mucocutaneous integument**

- Biology and disorders of the oral mucosa
- Disorders of the anogenitalia of males and females
- 

### **Cutaneous changes in disorders of altered reactivity**

- Genetic immunodeficiency diseases
- Urticaria and Angioedema
- Disorders associated with complement abnormalities
- Graft-versus-host Disease
- Muco-cutaneous manifestations in immunosuppressed host other than HIV-infection
- Contact dermatitis
- Auto-sensitization dermatitis
- Atopic dermatitis (atopic eczema)
- Nummular eczematous dermatitis
- Seborrhoeic dermatitis
- Vesicular palmoplantar eczema

### **Skin changes due to mechanical and physical factors**

- Occupational skin disease
- Radiobiology of the skin
- Skin problems in amputee
- Sports dermatology
- Skin problems in war field
- Decubitus ulcers

### **Photomedicine, photobiology and photo immunology in relation to skin**

- Acute and chronic effects of ultraviolet radiation and sun light on the skin
- Narrow-band ultraviolet B (NBUVB) therapy, phototherapy, photochemotherapy

### **Disorders due to drugs and chemical agents**

- Cutaneous reactions to drugs
- Mucocutaneous complications of anti-neoplastic therapy
- Cutaneous manifestations of drug abuse

### **Dermatology and the ages of man**

- Neonatal dermatological problems
- Pediatric and adolescent dermatological problems
- Ageing of skin
- Geriatric dermatological problems

### **Skin lesions in nutritional metabolic and heritable disorders**

- Cutaneous changes in nutritional disease

- Acrodermatitis enteropathica and other zinc deficiency disorders
- Cutaneous changes in errors of amino acid metabolism: Tyrosinemia II, phenylketonuria, arginine succinic aciduria, and alkaptonuria
- Amyloidosis of the skin
- The porphyrias
- Xanthomatosis and lipoprotein disorders
- Fobry's Disease; galactosidase - a deficiency (Angiokeratoma corporis diffusum universale)
- Lipid proteinosis
- Cutaneous mineralisation and ossification
- Heritable disorders of connective tissue with skin changes
- Heritable disease with increased sensitivity to cellular injury
- Basal cell Naevus syndrome

### **Skin manifestations of hematologic disorders**

- Skin changes in hematological disease
- Langerhans cell and other cutaneous histiocytoses
- The Mastocytosis syndrome

## **Skin manifestations of systemic disease**

- The skin and disorders of the alimentary tract
- The hepatobiliary system and the skin
- Cutaneous changes in renal disorders, cardiovascular, pulmonary disorders and endocrinal disorders
- Skin changes and diseases in pregnancy
- Skin changes in the flushing disorders and the carcinoid syndrome

## **Skin manifestations of rheumatologic disease**

- Lupus Erythematosus
- Dermatomyositis
- Scleroderma
- Systemic Necrotizing Arteritis
- Cutaneous Necrotising venulitis
- Cryoglobulinemia and Cryofibrinogenemia
- Relapsing Polychondritis
- Rheumatoid Arthritis, Rheumatic Fever and Gout
- Sjogren's syndrome
- Raynaud's phenomenon
- Reiter's syndrome
- Multicentric Reticulohistiocytosis
- 

## **Cutaneous manifestations of disease in other organ systems**

- Sarcoidosis of the skin
- Cutaneous manifestations of Internal Malignancy
- Acanthosis Nigricans
- Scleredema
- Papular Mucinosis
- Neurocutaneous disease
- Tuberous Sclerosis Complex
- The Neurofibromatosis
- Ataxia Telangiectasia
- Behcet's disease

## **Bacterial diseases with cutaneous involvement**

- General considerations of bacterial diseases
- Pyoderms: Staphylococcus aureus, Streptococcus, and others
- Staphylococcal Scalded-Skin syndrome
- Soft Tissue Infections: Erysipelas, Cellulitis, Septicemia and Gangrenous Cellulitis
- Gram-Negative Coccal and bacillary infections
- Bartonellosis

- Miscellaneous bacterial infections with cutaneous manifestations
- Tuberculosis and other myopacterial infections
- Actinomycosis, Necardiosis, and Actinomycetoma
- Lyme Borreliosis
- Kawasaki Disease

### **Fungal diseases with cutaneous involvement**

- Superficial fungal infection: Dermatophytosis, Tinea Nigra, Piedra
- Yeast Infections: Candidiasis, Pitryiasis (Tinea) Versicolor
- Deep Fungal Infections

### **Viral and ricketisial disease**

- Viral Diseases: general consideration
- Rubella (German Measles)
- Measles
- Hand, Foot and Mouth Disease
- Herpangina
- Erythema Infectiosum and Parvovirus B 19 infection
- Herpes simplex
- Varicella and Herpes Zoster
- Cytomegalovirus Infection
- Epstein - Barr Virus Infections
- Human Herpes virus 6 & 7 infections and Exanthem subitum (Roseola Infantum or Sixth Disease)
- Smallpox and Complications of small pox vaccination
- Contagious Pustular Dermatitis, Contagious Ecthyma: Orf virus infection
- Milluscum Contagiosum
- Miller's Nodules
- Warts
- Human Retroviral Disease: Human T-Lymphotropic Virusviruses

## **Therapeuti**

### **cs Topical**

#### **therapy**

- Pharmacokinetics principles intopical applications of drugs.
- Principles of topical therapy.
- 

#### **Topical agents**

- Glucocorticoids, Acne therapies, Analgesics, Anesthetics, Anti-inflammatory, Anti hair loss, Anti-microbial, Anti-parasitic, Anti-perspirants, Anti-pruritic, Anti-viral, Astringents, Bleaching agents, Keratolytics, Psoriasis therapies, Wart therapies,



Topical Retinoids, Topical Antibiotics, Topical Anti-fungal Agents, Sun-protective Agents, Keratolytic Agents, Topical Cytotoxic Agents, Cosmetics and Skin care in practice.

### **Systemic therapy**

Systemic glucocorticoids, Sulfones, Aminoquinolines, Cytotoxic and Antimetabolic Agents, Oral Retinoids, Antihistamines, Antibiotics, Antiviral Drugs, Oral

- Subcorneal pustular dermatoses.
- Pustular eruptions of palms and soles.
- Antifungal Agents, Immunosuppressive and Immunomodulatory drugs, Thalidomide, photo-chemotherapy and photo-therpay, electric cautery, cryotherapy, electrolysis, tattooing, intra-lesional injections etc.

### **Surgery in dermatology**

- Dermatologic Surgery: Introduction and Approach
- Skin Resurfacing: Chemical Peels
- Skin Resurfacing: Dermabrasion
- Skin Resurfacing: Laser
- Skin punch grafting
- Wound Dressings
- Cryosurgery
- Nail Surgery

### **Venereology**

- Clinical approach to the patient of sexually transmitted disease
- Anatomy of male and female genitalia
- Epidemiological aspects of STDs
- Viral STDs including HIV, Herpes, Human Papilloma virus (HPV), Molluscum contagiosum, Espirito Santo virus (ESV) etc.
- Bacterial STD's: Syphilis, Gonorrhoea, Chancroid, Donovanosis
- Chlamydial infections: Lymphogranuloma venereum, urethritis, cervicits, nongonococcal urethritis (NGU), non-specific vaginitis etc.
- Fungal: Candidiasis
- Protozoal: Trichomoniasis
- Ectoparasitic: Scabies, Pediculosis infestations.
- Syndromic management of STDs
- HIV/AIDS - Epidemiology, transmission, patient load, High risk groups, cutaneous manifestations of HIV, treatment of opportunistic infections, antiretroviral therapy, management of STDs in HIV positive cases

- STDs in reproduction health and Pediatrics
- STDs and HIV
- Prevention, counselling and education of different STDs including HIV
- National Control Programmes of STDs and HIV infection
- Medico-legal, social aspects of STDs including psychological and behavioural abnormalities in STD patients

## **Leprosy**

- Approach to the patient with leprosy
- Epidemiological aspects
- Structure, biochemistry, microbiology of *Mycobacterium leprae*
- Animal models
- Pathogenesis
- Classification
- Immunology and molecular biological aspects
- Histopathology and diagnosis including laboratory aids
- Clinical features
- Reactions
- Systemic involvement (Ocular, bone, mucosa, testes and endocrine etc.)
- Pregnancy and leprosy
- HIV infection and leprosy

## TEACHING AND LEARNING METHODS

A post graduate student pursuing the course should work in the institution as a full time student. No candidate should be permitted to run a clinic/laboratory/nursing home while studying postgraduate course. Each year should be taken as a unit for the purpose of calculating attendance. Every student shall attend teaching and learning activities during each year as prescribed by the department and should not be absent from work without valid reasons.

### Teaching methodology:

- **Lectures:** Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated.

a. **Didactic Lectures:** Few topics are suggested as examples:

- 1) Bio-statistics
- 2) Use of library
- 3) Research Methodology
- 4) Medical code of Conduct and Medical Ethics
- 5) National Health and Disease Control Programmes
- 6) Communication Skills

These topics may preferably be taken up in the first few weeks of the first year.

- **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book the relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance. **Atleast 4 times in the year.**
- **Subject Seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator should be announced in advance.

### 4. Case Discussion: Minimum 5 cases to be presented by every PG every year.

Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details.

The presentations would be evaluated using check lists and would carry weightage for

Internal assessment. A timetable for the case presentation with names of the students should be announced in advance.

➤ **Tutorials/ Group Discussion:** On basic topics like histopathology/ drugs in dermatology etc. once weekly.

**6. Ward Rounds:** Ward rounds may be service or teaching rounds.

a) Service Rounds: Postgraduate students should do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.

b) Teaching Rounds: Every unit should have ‘grand rounds’ for teaching purpose at the bed side. A diary should be maintained for day-to-day activities by the post-graduate students. Entries of (a) and (b) should be made in the Log book.

**7.Clinico-Pathological Conference:** Recommended once in 2 months for all post graduate students. Presentation is to be done by rotation. Presentations will be assessed using checklist. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

**8. Inter Departmental Meetings:** Strongly recommended particularly with departments of **Pathology & Radiology inter departmental meetings will be held once in 15 days with pathology and monthly once with radiology.** These meetings should be attended by post-graduate students and relevant entries must be made in the Log Book. The staff of pathology will show the slides & present final diagnosis.

**Pathology:** Interesting cases shall be chosen and presented by the post-graduate students and discussed by them as well as the senior staff of Pathology department once in every 15 days. The staff of Pathology department would then show the slides and present the final diagnosis. In these sessions the advanced immunohistochemical techniques and other recent developments can be discussed.

**Radiology:** Interesting cases shall be chosen and presented by the post-graduate students and discussed by them as well as the senior staff of Radiology department once in month.

**9. Mortality Meeting:** The mortality meeting should be conducted in the department every month. The post graduate student should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting.

**10. Teaching Skills:** Post-graduate students must teach under graduate students (eg. Medical, Nursing) by taking demonstrations, bedside clinics, tutorials, lecture, etc. Assessment is made using a checklist by medical faculty as well as by the students. Record of their participation is to be kept in the Log Book. Post graduates posting to skill lab for learning suturing techniques and wound care for 2 days in 2<sup>nd</sup> term in rotation.

**11. Continuing Medical Education Programmes (CME):** Recommended that at least 2 CME programmes should be attended by each student during the course.

**12. Conferences:** Have minimum one Poster presentation or Podium Presentation at a National/ Zonal/ State conference.

- Have minimum one Research paper publication in journal as first Author.

**13. Research Activities:** Complete an online course in Research methodology (NPTEL) in the first year submit certificate generated on successful completion of the course and examination.

- Complete a certification course in ethics including good clinical practices and good laboratory practices in the first year of the course conducted by institutions.
- No-post graduate student shall be permitted to appear in the examination without the above Certification.

**14. Additional Courses:** Complete a certification course in basics Cardiac life support (BCLS) and advanced Cardiac life support (ACLS) skills in the first year of the course conducted by institution.

- No-post graduate student shall be permitted to appear in the examination without the above certification.

**15.** Minimum of 80% attendance is compulsory to appear for theory examinations.

## **B) Clinical / Practical Training:**

### **1. Rotational Postings in other Departments:**

These are essential to acquire knowledge in allied subjects as applicable to Dermatology, Venereology and Leprosy. It is preferable to post students to:

#### **1. General Medicine / Emergency Medicine– 2 weeks**

Plastic Surgery – 2 weeks

#### **2. UHC/PHC – 1 month each in 3/4/5<sup>th</sup> semester as a part of District residency program,**

Supervised and having log book entries. supervised and having log book entries.

### **1. Thesis Writing:**

Thesis writing is compulsory. All MD students are required to carry out work on a selected research project under the guidance of a recognized post graduate teacher, the result of which shall be written up and submitted in the form of a Thesis.

During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.

3. Thesis acceptance by all evaluators before the conduct of the university Examination

## **OTHER CRITERIA TO BE FULFILLED FOR THE DEGREE COURSE**

## **ASSESSMENT**

**FORMATIVE ASSESSMENT, i.e., during the training may be as follows:**

**Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.**

### **1. Internal evaluation:**

During the course of three years, the department will conduct three tests, two of them conducted annually, one at the end of the first year and the other at the end of the second year. The third test may be held three months prior to the final examination. The tests may include written papers, practicals / clinicals and viva voce. Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the University when called for.

Results of all evaluations should be entered into P. G's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

### **2. Maintenance of E-Logbook**

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the University practical/clinical examination.

## **SUMMATIVE ASSESSMENT, i.e., at the end of training**

**Essential pre-requisites for appearing for examination include:**

### **Revised Eligibility requirements for PG Students in Broad Specialty and Super Specialty for appearing in university examination:**

- a. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.
- b. Have minimum one Poster presentation or Podium presentation at a National / Zonal / State Conference of his/her specialty.
- c. Have minimum one Research paper published in journal of his/her specialty as first author.
- d. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
- e. Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
- f. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
- g. Thesis acceptance by all evaluators before the conduct of University Examination.
- h. Attendance of 80% is mandatory.

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS (PGMER 2023). The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

**The university shall conduct not more than two examinations in a year, with an interval of not less than 4 months and not more than 8 months between the two examinations.**

The summative examination would be carried out as per the Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 29<sup>th</sup> December 2023.



The examination shall be in three parts:

### **1. Thesis**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

### **2. Theory: 400 Marks**

There shall be four question papers, each of three hours duration. Each paper shall consist of 10 essay questions, each question carrying 10 marks Total marks for each paper will be 100.

Type of questions	Number of questions	Marks for each question	Total marks
Short essay	10	10	100
GRAND TOTAL			100

Details of the distribution of topics for each paper are as follows:

Paper I Basic Sciences as applied to Dermatology,

Venereology and Leprosy 100

Paper II Dermatology 100

Paper III Venereology & Leprosy 100

Paper IV Dermatology in relation to Other Systemic Diseases,

Dermato-therapeutics, Dermato-surgery and Recent  
Advances in Dermatology, Venereology & Leprosy 100

**Note: The distribution of chapters/topics shown against the papers are suggestive only and may overlap or change.**

### 3. Clinical / Practical Examination: 300 Marks

To elicit competence in clinical skills and to discuss differential diagnosis and therapeutic aspects.

- Dissertation 20 Marks
- Type of cases
- 1 Long case 100 Marks
- 2 Short cases 40+40 Marks
- 10 Spotters (Varieties of cases included) 70 Marks
- 6 OPSE 30 Marks

### 4. Viva Voce Examination: 100 Marks

#### 1) Viva-Voce Examination: (100 Marks)

Candidates will be examined by all examiners for comprehension, analytical approach, expression and interpretation of data. It includes all components of the course contents. In addition, candidates may also be given case reports, gross specimens, pathology slides, instruments, X-rays, etc for interpretation.

### SCHEME OF EXAMINATION

Maximum Marks for M.D. Dermatology, Venereology and Leprosy	Theory	Practical	Viva	Grand Total
	400	300	100	800

Obtaining a **minimum of 40% marks in each theory paper** and **not less than 50% cumulatively in all the four papers** for degree examination shall be mandatory.

Obtaining of **minimum of 50% marks in Practical Examination** shall be mandatory for passing the examination as a whole in degree examination. Hence a **candidate shall secure not less than 50% marks in each head of examination which shall include Theory and Practical including clinical and viva voce examination. No grace marks is permitted** in Postgraduate Examination either for **Theory or for Practical**.

**The University shall not conduct more than 2 examination in a year, an interval not less than 4 months and not more than 8 months between the 2 examinations.**

**RECOMMENDED BOOKS (LATEST EDITIONS):**

<b>Sl. No.</b>	<b>Name of the book</b>	<b>Names of the editors</b>	<b>Publisher</b>
1	Rook's Textbook of Dermatology – 4 vol.	Burns, Breathnach, Cox, Griffiths	Blackwell Science
2	Fitzpatrick's Dermatology in General Medicine – 2 vol.	Goldsmith, Katz, Gilchrist, Paller, Leffell, Wolff	McGraw Hill Publications
3	Dermatology – 2 vol.	Moschella, Hurley	W.B.Saunders Company
4	Lever's Histopathology of the Skin	Elder, Elenitsas, Johnson	Lippincott-Raven
5	Dermatology – 2 vol.	Jean L. Bologna, Jorrizzo, Rapini	Mosby Publication
6	IADVL Text Book and Atlas of Dermatology – 2 vol.	Valia, Valia, Siddappa	Bhalani Publishing House
7	Andrew's Diseases of the Skin-Clinical Dermatology	Elston, James, Berger,	W.B.Saunders, Elsevier
8	Text Book & Atlas of Dermato-Surgery & Cosmetology	Satish S. Savant, Radha Atal-Shah, Deepak Gore	Association of Scientific Cosmetologists and Dermatologists
9	Skin Disease: Diagnosis and Treatment	Thomas P. Habif	Mosby Publication
10	Clinical Dermatology	Habif	Mosby Publication
11	Leprosy	Hastings	Churchill Livingstone
12	Leprosy	Dharmendra	Samant & Company
13	Leprosy	Bryceson, Roy & Pfaltzgraff	Churchill Livingstone
14	Handbook of Leprosy	Jopling, Mc Dougall	CBS Publishers & distributors
15	Sexually Transmitted Diseases	Holmes, Sparling, etc V.K. Sharma	McGraw Hill Publications
16	Venereal Diseases	King, Nicol	ELBS
17	Sexually Transmitted Infections	Bhushan Kumar, Gupta	Elsevier
18	Comprehensive Dermatological Drug Therapy	Wolvorten	Elsevier
19	Dermatology Vol. I & II	Jean L. Bologna Jorrizzo, Rapini	Elsevier

**RECOMMENDED JOURNALS:**

<b>Sl. No.</b>	<b>Name of the journal</b>
1	Archives of Dermatology
2	British Journal of Dermatology
3	Dermatology
4	Indian Journal of Dermatology, Venereology & Leprosy
5	International Journal of Dermatology
6	Journal of American Academy of Dermatology
7	Journal of Investigative Dermatology
8	Dermatology Clinics of North America
9	Genitourinary Medicine
10	Sexually Transmitted Infections (British)
11	Indian Journal of Leprosy
12	International Journal of Leprosy
13	Leprosy Review



# **GUIDELINES FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN GENERAL MEDICINE**

## **I Preamble:**

The purpose of post graduate (PG) education in General Medicine is to create specialists who would provide high quality health care to the community and advance the cause of science through research, training and teaching the medical fraternity.

The competency-based training program aims to produce a postgraduate doctor who after required training should be competent to handle all problems related to general medicine including recent advances and able to deal effectively with the medical needs of the community. The postgraduate specialist is also expected to know the principles of research methodology and modes of accessing literature and also be able to update himself with advances and practice evidence-based medicine. They should be trained to work in synchrony with faculty in super-speciality courses of medicine and to follow a holistic approach to medical care which will lead to the development of good quality teachers. Student should also acquire skill in teaching of medical/para-medical students in General Medicine.

## **II OBJECTIVES;**

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate complete the course. The objectives may be considered under following subheadings.

## **SUBJECT SPECIFIC OBJECTIVES**

Postgraduate training should enable the student to:

- Practice efficiently internal medicine specialty, backed by scientific knowledge including basic sciences and skills which are evidence based.
- Conduct clinical examination and relevant investigations, diagnose medical conditions and refer early where indicated.

- Plan and deliver comprehensive treatment using the principles of rational drug therapy.
- Plan and advise measures for the prevention and rehabilitation of patients.

- Manage emergencies efficiently by providing Basic Life Support (BLS) and Advanced Life Support (ALS).
- Recognize conditions that may be outside of scope of general medicine and refer to an appropriate specialist.
- Exercise empathy and a caring attitude and maintain professional integrity, honesty and high ethical standards.
- Document case details including epidemiological data.
- Play the assigned role in the implementation of National Health Programs.
- Demonstrate competence in basic concepts of research methodology and clinical epidemiology; and preventive aspects of various disease states.
- Become a motivated 'teacher' - defined as one keen to share knowledge and skills with a colleague or a junior or any learner.
- Continue to evince keen interest in continuing education and use appropriate learning resources.
- Practice the medico-legal responsibilities.
- Undertake audit related to patient care, morbidity and mortality, use information technology tools and carry out research - both basic and clinical, with the aim of publishing the work and presenting the work at scientific forums.
- Participate in public health emergencies (arising in the community).
- Estimate the financial burden of care and practice health economics and rational approach to investigations.
- Communicate about the illness with patients /relatives at all stages of care.



## **SUBJECT SPECIFIC COMPETENCIES**

**By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:**

**A. Predominant in Cognitive Domain:**

1. Describe clinical features of diseases of various aetiology affecting all systems in the adult and geriatric population.

2. Apply the basic sciences knowledge in understanding and managing common diseases.
3. Describe the investigations to be undertaken at various levels like OPD, Ward, ICU etc. and choose them appropriately depending on the clinical features and epidemiologic principles.
4. Describe the pharmaco-therapeutics of various diseases and complications.
5. Describe and discuss the health issues related to environmental and ecological factors.
6. Describe and discuss the methods and mechanisms of rehabilitation following diseases.
7. Describe and discuss the issues related to palliative and terminal care.
8. Incorporate the national and international guidelines related to various diseases in day to day practice and teaching.
9. Describe and discuss the social and economic aspects of illnesses, outbreaks and epidemics.
10. Analyse the observations of disease patterns in patients and community and make suggestions for improvement in management and prevention.
11. Describe and discuss the National Health Programs.
12. Analyse and critique the publications related to various aspects of illnesses and evidence based medicine.
13. Describe and discuss the various levels of prevention in communicable and non - communicable diseases.
14. Describe and discuss various legislations related to organ transplant, brain death, informed consent, human rights etc.
15. Be updated on recent advances in internal medicine.

**B. Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient, relatives, paramedical and medical colleagues to provide the best possible comprehensive care.
2. Always adopt ethical principles and maintain professional etiquette in dealing with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second

opinion.

3. Develop communication skills to interact with patients, relatives, peers and paramedical staff, with special emphasis on breaking bad news empathetically.
4. Should demonstrate equity and equality when dealing with individuals of special groups (differently abled and LGBTQIA+).

**C. Predominant in Psychomotor domain:**

The post graduate student, at the end of the course should be able to perform the following skills, independently (PI) or under supervision (PS):

**Clinical Assessment Skills**

- Elicit a detailed clinical history (PI)
- Perform a thorough physical examination of all the systems (PI)

**Procedural Skills**

- Test dose administration (PI)
- Mantoux test (PI)
- Subcutaneous injection (PI)
- Intramuscular injection (PI)
- Intravenous cannulation (PI)
- Intravenous injections (PI)
- IV- Infusions (PI)
- Sampling of fluid for culture (PI)
- ECG recording (PI)
- Pleural tap (PI)
- Lumbar puncture (PI)
- Arterial puncture for ABG (PI)
- Bone marrow aspiration and biopsy (PI)
- Abdominal paracentesis - diagnostic (PI)
- Aspiration of liver abscess (PI)

**Desirable**

- Ultrasound abdomen at point of care (PI)
- Fine needle aspiration cytology (FNAC) from palpable lumps (PI)

- Joint fluid aspiration (PI)
- Liver biopsy (PI)
- Kidney biopsy (PS)
- Cardiac-TMT (PS)
- Pericardiocentesis (PS)
- Holter monitoring (PS)
- Echocardiography (point of care) (PS)
- Doppler studies (PS)

### **Respiratory Management**

- Nebulization (PI)
- Inhaler therapy (PI)
- Oxygen delivery (PI)
- Non-invasive and mechanical ventilation (PI)

### **Critically ill Person**

- Monitoring a sick person (PI)
- Endotracheal intubation (PI)
- Cardio-pulmonary resuscitation(PI)
- Central vein cannulation and CVP monitoring (PI)
- Using a defibrillator (PI)
- Pulse oximetry (PI)
- Feeding tube/Ryle's tube, stomach wash (PI)
- Nasogastric intubation (PI)
- Urinary catheterization - male and female (PI)
- Hemodialysis (PS)
- Certification of Brain death (PI)

### **Interpretation Skills**

Interpretation of results of the following investigations, considering clinical data (history & examination findings).

- Treadmill testing (PI)
- ABG analysis (PI)
- Ultrasonography (PI)

- CT scan chest and abdomen (PI)
- CT scan head and spine (PI)
- MRI- Brain and spine (PI)
- Barium studies- desirable (PI)
- IVP, VUR studies
- Pulmonary function tests (PI)
- Immunological investigations (PI)
- Nerve conduction studies /EMG (PI)
- EEG (PI)
- Evoked potential interpretation (PI)
- Hemodynamic monitoring
- Nuclear isotope scanning
- MRI spectroscopy/SPECT
- Ultrasound guided aspiration and biopsies

### **Communication Skills (PI)**

While eliciting clinical history and performing physical examination, emphasize on:

- Communicating health and disease,
- Pre-test and post-test counseling for HIV,
- Pedagogy: teaching students, other health functionaries: lectures, bedside clinics, discussions,
- Health education: prevention of common medical problems, promoting healthy life- style, immunization, periodic health screening, counseling skills in risk factors for common malignancies, cardiovascular disease, AIDS etc.
- Dietary counseling in health and disease,
- Linking patients with community resources,
- Providing referral,
- Genetic counseling,
- Communicating bad news to the patient and relatives.

### ***Patient management skills***

- Proficiency in management of medical emergencies, including triaging.
- Drawing and executing patient management plan and long term care.
- Documenting patient records.
- Identifying need for timely referral.

### **Others**

- ***Demonstration of the following: (PI)***
  - Professionalism
  - Ethical behavior (humane and professional care to patients)
- **Utilization of Information Technology**
  - Medline search, Internet access, computer usage
- **Research Methodology**
  - designing a study
  - interpretation and presentation of scientific data
- **Self-Directed Learning (SDL)**
  - identifying key information sources
  - literature searches
  - information management
- **Therapeutic Decision-Making**
  - managing multiple problems simultaneously
  - assessing risks, benefits and costs of treatment options
  - involving patients in decision-making
  - selecting specific drugs within classes
  - rational use of drugs

# **Syllabus**

**Course contents:**

## **A: Cognitive Domain:**

### **Basic Sciences**

#### **1. Basics of human anatomy as relevant to clinical practice:**

- Surface anatomy of various viscera
- Neuro-anatomy
- Important structures/organ's location in different anatomical locations in the body
- Histology of organs
- Blood supply, nerve supply to various organs
- Common congenital anomalies

#### **2. Applied physiology of various organ systems:**

- Basic functioning of various organ-system, control of vital functions.
- Pathophysiological alteration in diseased states.
- Interpretation of symptoms and signs in relation to pathophysiology.
- Physiology of temperature, sleep regulation.

#### **3. Applied biochemical basis of various diseases including fluid and electrolyte disorders:**

- Acid-base disorders, disorders of carbohydrate, fat, protein, calcium, phosphorous and iron metabolism.
- Interpretation and clinical application of various biochemical tests.

#### **4. Applied pathology of different diseases.**

- Common pathological changes in various organs associated with diseases and their correlation with clinical signs.
- Understanding of various pathogenic processes and possible therapeutic interventions.
- Preventive measures at various levels to reverse or arrest the progression of diseases.



5. Knowledge about various microorganisms, their special characteristics important for their pathogenetic potential or of diagnostic help:

- Important organisms associated with tropical diseases, their growth pattern/life- cycles,
- Levels of therapeutic interventions possible in preventing and/or eradicating the organisms,
- Antimicrobial resistance,
- Antibiotic stewardship,
- Hospital infection control,
- Biomedical waste management,
- Vaccinology.

6. Knowledge about pharmacokinetics and pharmacodynamics of the drugs used for the management of common problems in a normal person and in patients with diseases of kidneys/liver/systemic disorders which may need alteration in doses due to abnormal metabolism/excretion of the drugs:

- Pharmacokinetics and pharmacodynamics of drugs: principles and methodology
- Rational use of available drugs.
- Principles of drug therapy,
- Adverse drug reactions,
- Drug interaction,
- Pharmacovigilance,
- Drug abuse and addiction,
- Drug development,
- Pharmacoeconomics,
- Pharmacogenomics.
- Precision medicine
- Biology of addiction
- Complementary and alternative medicine
- Evidence-based medicine in drug therapy.

7. Research methodology, study designs, clinical epidemiology and biostatistics relevant to medical sciences.

8. National Health Programmes:

- Investigation of community outbreak,
- Public health policy,
- Health promotion,
- Prevention of communicable and non-communicable diseases.
- International health regulations,
- Travel medicine.

9. Knowledge about various poisons with specific reference to different geographical and clinical settings - their diagnosis and management.

- Knowledge about snake bite, other bites and stings,
- Medicolegal aspects.

### **Systemic Medicine**

10. Preventive and environmental issues, including principles of preventive health care, immunization and occupational, environmental medicine and bioterrorism,

- Health tourism,
- Rehabilitation,
- Drowning,
- Heat and altitude related disorders.

**11. Geriatric Medicine:**

- Physiology and biology of aging and various organ changes in elderly.
- Principles of geriatric medicine and uniqueness of geriatric presentation.
- Physical examination of geriatric patient.
- Drug metabolism, laboratory tests in elderly.
- Management of unique problems related to elderly such as nutrition, falls, urinary incontinence, gait disorders, neuro- psychiatric problems etc.
- Mental health disorders,
- Elderly neglect and abuse,

- Social and family support and rehabilitation of elderly.
- Assessment of functional and cognitive aspects, counseling and communication with elderly.
- Appropriate medication and avoidance of poly-pharmacy.

## **12. Genetics:**

- Overview of the paradigm of genetic contribution to health and disease
- Principles of Human Genetics
- Genetic basis of medical disorders
- Single gene and chromosomal disorders
- Genetic counseling
- Prevention of genetic disorders
- Genetic analysis
- Gene therapy
- Diseases caused by genetic defects of mitochondria.
- Screening counseling and presentation of genetic disorder.
- Human genome project, stem cell therapy and gene transfer in clinical medicine.

## **13. Immunology:**

- Innate and adaptive immune systems
- Mechanisms of immune mediated cell injury
- HLA system, primary and secondary immune-deficiency,
- Allergic disorders: urticaria, angioedema, anaphylaxis and other allergic disorders.
- Transplantation immunology, immunocomplex disorders, organ specific and multisystem immune disorders, monoclonal antibodies.

## **14. Cardio-vascular diseases:**

- Essential Anatomy, Physiology and Embryology of the heart.
- Approach to the patient with Cardiovascular diseases
- Physical examination of the Cardiovascular system
- Relevant investigations for the diagnosis of cardiac diseases
- Bradyarrhythmias- disorders of sinus node function and AV conduction disturbances
- Tachyarrhythmias- premature complexes, atrial tachycardia, atrial flutter, atrial fibrillation, supraventricular, junctional and ventricular tachyarrhythmias.
- Heart failure

- Cor Pulmonale
- Valvular heart disease
- Infective endocarditis
- Cardiomyopathy and myocarditis
- Pericardial disease
- Congenital heart disease in the adult
- Cardiac tumors
- Cardiac manifestations of systemic diseases and traumatic cardiac injury
- Pulmonary hypertension
- Cardiac Transplantation and Prolonged assisted circulation
- Heart disease in the elderly
- Cardiac patient and surgery
- Cardiac disorder in pregnancy
- Therapeutic procedures- BLS, ALS, Defibrillation, Cardiac pacing, Pericardiocentesis, Intra-aortic balloon pumping 3rd Generations Stents
- Devices in Cardiac disorder.
- Newer Investigation for diagnosis of rhythm abnormalities: External Loop Records, Internal Loop
- Atherosclerosis- pathogenesis, clinical manifestations, prevention and treatment of atherosclerosis.
- Ischemic heart diseases- stable angina pectoris, unstable angina pectoris, acute myocardial infarction. The student is expected to know about percutaneous revascularization procedures and CABG.
- Systemic hypertension
- Diseases of the aorta
- Vascular diseases of the extremities
- ECMO

## **15. Respiratory System:**

- Applied aspects of respiratory anatomy and respiratory physiology.
- Approach to the patient with disease of respiratory system.
- Disturbances in respiratory function.
- Diagnostic procedures in respiratory diseases.
- Asthma, tropical pulmonary eosinophilia, hypersensitivity pneumonitis
- Environmental lung diseases.
- Chronic bronchitis, emphysema and airways obstruction.
- Small airways disease

- Interstitial lung diseases.
- Smoking and air pollution.
- Mycobacterial diseases - diagnostic methods, pathogenesis, clinical manifestation and treatment. National programme on tuberculosis including DOTS.
- Pneumonitis, Pneumonia.
- Pulmonary manifestation of systemic diseases.
- Lung abscess, bronchiectasis, cystic fibrosis.
- Pulmonary thromboembolism.
- Disorders of pleura, mediastinum and diaphragm.
- Disorders of ventilation.
- Obstructive sleep apnea syndrome
- Diseases of the chest wall, pleura and mediastinum
- ARDS.
- Mechanical ventilator support.
- Intrathoracic malignancies.
- Lung transplantation.
- Surgical approach to lung disease.

## **16. Nephrology:**

- Structure and function of the kidneys.
- Fluid and electrolytes.
- Acid base disorders.
- Approach to the patients with kidney disease.
- Acute kidney injury.
- Chronic kidney disease.
- Glomerular diseases.
- Nephrotic syndrome
- Tubular disorders.
- Tubulointerstitial diseases of the kidney
- Reno vascular hypertension
- Cystic renal disease.
- Nephrolithiasis.
- Urinary tract infection and pyelonephritis.
- Obstructive Uropathy.

- Diabetes and the kidney
- Drugs and kidney.
- Tumors of the kidneys and genitourinary tract.
- Diseases of prostate gland.
- Renal replacement therapy- hemodialysis, peritoneal dialysis, Renal Transplantation
- Treatment of irreversible renal failure.
- Renal involvement in systemic disease.

## **17. Gastro-Intestinal Diseases:**

- Approach to the patient with gastrointestinal diseases
- Gastrointestinal endoscopy procedures
- Diseases of the esophagus
- Motility disorders
- Peptic ulcer and related disorders
- Disorders of absorption and digestion
- Inflammatory bowel diseases
- Irritable bowel syndrome
- Functional gastrointestinal disorders
- Common diseases of the colon
- Diarrhea
- Malabsorption syndromes
- Diverticular diseases.
- Mesenteric vascular insufficiency
- Acute intestinal obstruction
- Acute appendicitis
- Peritonitis
- Diseases of the rectum and anus.
- Approach to the patient with pancreatic diseases
- Acute pancreatitis
- Chronic pancreatitis
- Neuroendocrine tumors of the pancreas

## **18. Diseases of the Liver and Gall bladder:**

- Approach to the patient with liver diseases
- Evaluation of liver function tests
- Hepatobiliary disorders Imaging
- The hyperbilirubinemias
- Acute viral hepatitis
- Chronic hepatitis
- Alcoholic liver disease
- Toxic and drug induced hepatitis
- Non- alcoholic steatohepatitis
- Portal hypertension
- Cirrhosis and its complications
- Non-cirrhotic portal hypertension
- Budd Chiari syndrome
- Liver abscess
- Infiltrative, genetic and metabolic diseases affecting liver
- Liver diseases in pregnancy
- Liver in systemic disease
- Veno-occlusive diseases of liver
- Liver tumors
- Hepatic failure
- Liver transplantation
- Diseases of the gall bladder and bile ducts

## **19. Hematology Diseases:**

- Hematopoiesis
- Iron deficiency anemia
- Megaloblastic anemia
- Hemolytic anemia and anemia due to acute blood loss
- Aplastic anemia, myelodysplasia and related bone marrow failure syndromes
- Hypoproliferative anemias
- Disorders of hemoglobin
- Polycythemia vera and other myeloproliferative diseases

- Acute and chronic myeloid leukemia
- Malignancies of lymphoid cells
- Plasma cell disorders
- Transfusion biology and therapy
- Hematopoietic cell transplantation
- Disorders of platelet and vessel wall
- Coagulation disorders
- Venous thrombosis
- Antiplatelet, anticoagulant and fibrinolytic drugs
- Blood components and transfusion medicine

## **20. Oncology:**

- Epidemiology
- Approach to the patient with cancer
- Prevention and early detection of cancer
- Cancer genetics
- Cancer cell biology and angiogenesis
- Principles of cancer treatment
- Infection in patients with cancer
- Cancer of skin
- Head and neck cancer
- Neoplasms of the lung
- Breast cancer
- Gastrointestinal tract cancer
- Tumors of the liver and biliary tree
- Pancreatic cancer
- Bladder and renal cell carcinoma
- Benign and malignant diseases of the prostate
- Testicular cancers
- Gynecological malignancies
- Soft tissue and bone sarcomas and bone metastasis
- Paraneoplastic syndromes.
- Thymoma.



- Late consequences of cancer and its treatment.
- Oncologic emergencies.
- Metastatic cancer of unknown primary site.
- Cancer chemotherapy
- Palliative care in cancer patients.
- Rehabilitation in cancer patients.

## **21. Metabolic Diseases - inborn errors of metabolism and disorders of metabolism:**

- Disorders of lipoprotein metabolism.
- Wilson's disease
- Hemochromatosis
- Porphyrrias
- Disorders of purine and pyrimidine metabolism
- Homocystinuria
- Inherited disorders of connective tissues
- Lipodystrophies

## **22. Nutritional Diseases:**

- Basic considerations of nutrition.
- Assessment of nutritional status, anthropometry
- Vitamin and trace mineral deficiency and excess.
- Enteral and parenteral nutrition therapy.
- Protein energy malnutrition.
- Free radicals and antioxidants deficiency and excess.
- Malnutrition in the hospital population.
- Biology of obesity.
- Evaluation and management of obesity.
- Eating disorders.

## **23. Endocrine Diseases:**

- Principles of endocrinology
- Chronobiology and neuroendocrinology and the neuroendocrine system.
- Anterior pituitary (disorders of anterior pituitary and hypothalamus).

- Posterior pituitary (disorders of neurohypophysis).
- Disorders of thyroid gland
- Disorders of adrenal cortex
- Disorders of adrenal medulla, catecholamines and pheochromocytoma.
- Diabetes mellitus
- Metabolic syndrome
- Dyslipidemia
- Hypoglycemia/ pancreatic islet cell disorders
- Disorders affecting multiple endocrine system (polyglandular disorders).
- Heart as an endocrine system
- Reproductive endocrinology including menopause and postmenopausal hormone therapy.

## **24. Rheumatic Diseases:**

- Approach to the patient with rheumatic diseases
- Osteoarthritis
- Systemic lupus erythematosus
- Rheumatoid arthritis
- Scleroderma- diffuse and limited
- Sjogren's syndrome
- Ankylosing spondylitis, reactive arthritis, psoriatic arthritis and undifferentiated spondyloarthropathy
- Systemic sclerosis
- Anti-phospholipid antibody syndrome
- Behcet's syndrome
- Vasculitis syndromes- polyarteritis nodosa, Wegener's granulomatosis, Takayasu's arteritis, Henoch - Schonlein purpura, Churg- Strauss syndrome, giant cell arteritis, Kawasaki disease, drug induced vasculitis
- Acute rheumatic fever
- Inflammatory myopathies
- Sarcoidosis
- Amyloidosis
- Emergencies in rheumatology
- Rheumatic manifestation of systemic disease

- Approach to articular and musculoskeletal disorders
- Gout and other crystal arthropathies
- Infectious arthritis
- Relapsing polychondritis
- IgG4 related disease
- Polymyalgia rheumatica
- Fibromyalgia
- Periarticular disorders of the extremities

## 25. Infectious Diseases:

- Basic consideration in Infectious diseases
- Clinical syndromes
- Approach to acutely ill febrile patients
- Community acquired clinical syndromes
- Nosocomial infections
- Infections in immunocompromised
- **Bacterial Diseases** -
  - Introduction:
  - Bacterial Genetics, pathogenesis, treatment and prophylaxis, sterilization, antibiotic resistance, bioterrorism.
  - Diseases caused by gram- positive bacteria: Staphylococcus, Streptococcus, Pneumococcus, Corynebacteria, Bacillus anthracis, Bacillus cereus, Clostridium Species-gas gangrene and food poisoning, Actinomycosis, Nocardiosis, Listeria.
  - **Diseases caused by gram- negative bacteria:**
  - Meningococci, Gonococci, Moraxella, Salmonella, Shigella, Proteus, Pseudomonas, Campylobacter, Helicobacter, Yersinia, Haemophilus, Bordetella, Brucella, Legionella, Bartonella, Klebsiella. Mycoplasma, Chlamydia, Rickettsia and Coxiella. Vibrio cholera and other vibriose.
  - **Spirochaetal Diseases:** Syphilis, Relapsing Fever, Lyme's disease and Leptospirosis.
  - **Mycobacterial Infections:** Pulmonary & extrapulmonary tuberculosis, leprosy, atypical mycobacterial infections.
- **Viral diseases** - Introduction: Classification, viral genetics, diagnostic modalities and antiviral therapy, emerging viral diseases.

- Diseases caused by the DNA virus: Smallpox, Chickenpox, Orf, Molluscum contagiosum, Herpes simplex, Varicella zoster, Herpes zoster, CMV, EBV, Adenovirus and Hepatitis B virus.
- Diseases caused by RNA virus:
  - Enterovirus- including Poliovirus, Cocksackie virus, Echovirus, Rhinovirus. Influenza virus with special reference to H5N1, H1N1 (swine flu), Mumps virus, Parainfluenza virus, Respiratory syncytial virus, Rubella, Ebola virus, Zika virus.
  - Arbovirus including- Chikungunya, Japanese encephalitis, Yellow fever, Dengue virus, Kyasanur forest disease, Hantaan virus, Chandipura virus. Rabies virus, Hepatitis A, C, D, E, F and G, Arenavirus, Ebola fever, Coronavirus, Rotavirus, Nipah virus.
- Oncogenic Viruses:
  - Viruses with oncogenic potential, mechanism of oncogenicity
- HIV and AIDS
  - Epidemiology, genetics, pathogenicity, Indian perspective, clinical features, lab diagnosis, Prevention and Treatment.
  - Drug resistance
  - Non opportunistic infections
  - Pre- exposing prophylaxis's
  - Post exposing prophylaxis's
  - HIV vaccine
  - Miscellaneous: Co-infection of various viral diseases, immunization and chemoprophylaxis, viruses in gene therapy
- Protozoal Infection
  - Introduction: General introduction, modes of transmission, lab diagnosis, antiprotozoal drugs
  - Diseases caused by amoeba, Entamoeba histolytica, primary amoebic meningoencephalitis.
  - Diseases caused by zoomastigotes: intestinal, oral, vaginal, blood and tissue flagellates.
  - Diseases caused by sporozoa: Isospora, Plasmodium, Toxoplasma.

- Helminthic Infection
  - Introduction: general introduction, modes of spread, diagnostic procedures and antihelminthic drugs
  - Diseases caused by cestodes: Taenia, Echinococcus, Hymenolepis, Diphylobothrium,
  - Diseases caused by trematodes: intestinal, hepatic, lung and blood trematodes
  - Diseases caused by Nematodes: Strongyloides, Ankylostoma, Necator, Angiostrongylus, Enterobius, Ascaris, Wuchereria, Brugia, Onchocerca, Monsonella, Loa, Dracunculosis, Gnathostoma.
  
- Fungal Infections
  - General Introduction, diagnostic modalities and treatment options; fungal infections in the immunocompromised; diseases caused by Histoplasmosis, Coccidioidomycosis, Blastomycosis, Cryptococcosis, Candidiasis, Aspergillosis, Mucormycosis, Pneumocystis Infection.

## 26. Neurology

### Diagnosis of Neurologic Disorders

- Neurobiology of diseases
- Approach to the patient with neurologic diseases
- Localization of neurological disease.
- Electrophysiological studies of the central and peripheral nervous system
- Neuroimaging in neurologic disorders
- Neurogenetics (molecular diagnosis)

### Diseases of the Central Nervous System

- Headache
- Seizures and epilepsy
- Coma
- Disorders of sleep

- Cerebrovascular diseases
- Alzheimer's disease and other dementias
- Parkinson's diseases and other extrapyramidal disorders
- Ataxic disorders
- Motor neuron diseases
- Disorders of cranial nerves
- Disorders of the autonomic nervous system
- Disorders of the spinal cord
- Traumatic lesions of the head and spine
- Primary and metastatic tumours of the nervous system
- Multiple sclerosis and other demyelinating conditions of the central nervous system
- Viral meningitis and encephalitis
- Bacterial meningitis and other suppurative meningitis
- Chronic and recurrent meningitis
- Brain abscess.
- Prion diseases
- Critical care neurology

### **Disorders of the Nerve and Muscle**

- Approach to the patient with peripheral neuropathy
- Guillain-Barre syndrome and other Immune mediated neuropathies
- Inherited neuropathies
- Myasthenia Gravis and other diseases of the neuromuscular junction
- Approach to the patient with muscle disease
- Polymyositis, Dermatomyositis and Inclusion Body myositis
- Muscular dystrophies and other muscle diseases.

- Chronic fatigue syndrome

## **27. Psychiatric Disorders**

Common psychiatric disorders in adult & geriatric population:

- Introduction to Psychiatry - Psychiatric history taking and clinical examination including the mental state examination
- Classification of psychiatric disorders
- Psychiatric aspects of physical diseases
- Mood (Affective) disorders - depressive disorders, mania and hypomania
- Suicide and attempted suicide, self-harm.
- Anxiety disorders - obsessive compulsive disorders, general anxiety disorders, panic disorder
- Schizophrenia
- Autistic Disorders
- Organic mental disorders
- Psychotherapies in Mental Health
- Eating disorders - anorexia nervosa, bulimia nervosa
- Sexual disorders
- Personality disorders
- Functional and psychosomatic disorder,
- Somatoform disorder,
- Dissociative/ conversion disorder.
- Substance use disorders.
- Lithium poisoning
- Psychiatry and the law

## **28. Dermatology:**

- Structure and functions of skin.
- Infections of skin.
- Papulo squamous and inflammatory skin rashes.
- Photo-dermatology.
- Erythroderma.
- Cutaneous manifestations of systematic diseases.

- Bullous diseases.
- Drug induced rashes.
- Disorders of hair and nails.
- Principles of topical therapy.

## **29. Radio Diagnosis**

- Ultrasound in medicine, doppler Imaging
- Computed Tomography
- Magnetic Resonance Imaging
- Nuclear Imaging PECT/PEMRI

## **30. Critical Care Medicine**

- Principles of critical care medicine.
- Approach to the patient in critical care setting.
- Acute respiratory failure.
- Ventilator management in the Intensive Care Unit.
- Approach to patient with shock.
- Care of terminally ill patients
- Cardiogenic shock and pulmonary edema.
- Advanced cardiac life support
- Cardiovascular collapse and cardiac arrest.
- Cardiopulmonary resuscitation.
- Severe sepsis and septic shock.
- Neurological critical care.
- Non Invasive positive pressure ventilation

## **31. Environmental and Occupational Hazards**

- Illnesses due to poisons, drug over dosage and envenomation
- Disorders caused by reptile bites and marine animal envenomations – ectoparasite infestations and arthropod bites and stings
- Specific environmental and occupational hazards



- Drowning and near drowning
- Electrical injuries
- Radiation injury
- Heavy metal poisoning
- Acclimatization disorders
- Disaster management
- Bioterrorism

## **32. Disorders of Bone and Mineral Metabolism**

- Introduction to bone and mineral metabolism
- Diseases of parathyroid gland and other hypercalcemic and hypocalcemic disorders
- Osteoporosis
- Osteomalacia and rickets
- Disorders of bone – Paget's disease of bone, osteosclerosis/osteonecrosis

## **33. Recent Advances**

- Student is expected to keep himself abreast of recent advances in various fields of medicine especially in diagnostic and therapeutic aspects of various diseases. Some of these advances are – electrophysiology of the heart, various ablation techniques in the treatment of cardiac arrhythmias, resynchronization therapy, ERCP, capsule endoscopy, bronchoscopy, stenting, interventional neurological techniques, gene therapy, organ transplantation, stem cell therapy, etc.

## **34. Miscellaneous**

- Medical illnesses in pregnancy
- Peri-operative evaluations
- Adult Immunisation

## TEACHING AND LEARNING METHODS

**Orientation session:** All PG students after joining the course will have an orientation session to acquaint them with syllabus, duties and responsibilities, basic skills including communication skills, presentation of journals, seminar, clinical cases etc,

Didactic lectures are of least importance; seminars, journal club, symposia, reviews and guest lectures will get priority for acquiring theoretical knowledge. Bedside teaching, grand rounds, case based learning, stimulation based study, self-directed learning, integrated learning, interactive group discussions and clinical demonstrations will be hallmark of clinical/practical learning. Students will have hands on training in performing various procedures and ability to interpret results of various test/investigations. Exposure to newer specialized diagnostic/therapeutic procedures will be done.

All students joining the postgraduate (PG) courses shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a e-log book for recording the training they have undergone, and details of the procedures done during laboratory and clinical postings in real time.

Self-Directed Learning (SDL) is an extension of the role of lifelong learner envisaged in the goals of the Indian Medical Graduate. All postgraduate students are expected to learn through Problem Based Learning, SDL, Project Based learning etc. Various forms of self-learning including those mediated through IT - enhanced methodologies will be adopted. Specific hours will not be ear-marked, but these will be integrated into day to day practice.

Post graduates are expected to learn through work-based discussions and experiential learning. Beyond documentations in e-logbook, they should demonstrate competency related to patient care, interpretation and communication skills during the routine work in wards, OPD, ICUs, district residency postings etc. They will be involved in teaching of Undergraduate (MBBS) students also.

**A. Lectures:** Didactic lectures will be used sparingly. A minimum of 10 lectures per year will be conducted in department. These lectures will cover topics on

1. Systemic medicine including CNS, CVS, Respiratory system, Gastro intestinal system, Endocrinology, etc.
2. Recent advances in medicine.

3. Research methodology and biostatistics.
4. Salient features of Undergraduate/Postgraduate medical curriculum.
5. Teaching and assessment methodology.

Topic number 3, 4 and 5 will be covered during research methodology/biostatistics and medical education workshop in the institute.

**B. Journal club** will be held once a week. All the PG students will attend and actively participate in discussion and enter in the e-Log Book the relevant details. Topics will include presentation and critical appraisal of original research papers, review articles, case studies, etc published in peer reviewed indexed journals. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the students and the moderator will be announced in advance.

**C. Student Seminar** will be schedule once a week. All the PG students are expected to attend and actively participate in discussion and enter in the e-Log Book relevant details. Important topics will be selected as per subject requirements and allotted for in-depth study by a postgraduate student. It will aim at comprehensive evidence-based review of the topic. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator will be announced in advance.

**D. Group Discussion:** Selected topics for group discussion are given to all PG students and all the PG students are expected to attend and actively participate in discussion and enter in the e-Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the group discussion with names of the students will be announced in advance.

**E. Bedside clinics** will be held twice a week. All the PG students are expected to attend and actively participate in discussion and enter in the e-Log Book relevant details. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), Mini Cx, simulations in skills lab, and case-based discussions etc. will be carried out. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the case presentation with names of the students will be announced in advance.

**F. Ward Rounds:** Ward rounds may be service or teaching rounds.

- a) **Service Rounds:** Postgraduate students will do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.
- b) **Teaching Rounds:** Every unit will have 'grand rounds' for teaching purpose at the bed side. The post-graduate students will maintain day-to-day activities in e-log book.

### **G. Student Symposium: Minimum of once every 3 months.**

A broad topic of significance will be selected, and each part will be dealt by one postgraduate student. A teacher moderator will be allocated for each symposium and moderator will track the growth of students. The symposium will aim at an evidence- based exhaustive review of the topic. All participating postgraduates will be graded by the faculty and peers.

### **H. Interdepartmental colloquium**

Faculty and students must attend once a three month meetings between the medicine department and Pathology/ Ophthalmology/Radiology on rotational basis on topics of current/common interest or clinical cases.

- I. Mortality Meeting:** The mortality meeting will be conducted in the department every month. The post graduate student will prepare the details regarding the cause of death and will present for discussion.
- J. Teaching Skills:** Post-graduate students must teach under graduate students and interns by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist faculty. Record of their participation will be entered in e-log Book. Training of postgraduate students in Educational Science and Technology will be conducted by department of medical education.
- K. Continuing Medical Education (CME):** Recommended to attend CME programmes at national/state/regional levels.
- L. Poster, Paper Presentation and Publication;** A post graduate student should present one poster and one paper at national/state/regional conferences. One research paper which should be published during the period of his postgraduate studies so as to make him eligible to appear for university examination.

### **M. G.(a). Rotational clinical postings**

During second year post graduates will be posted on rotation in super speciality departments, intensive care units.

<b>SL. NO</b>	<b>Departments</b>
1	Medical ICU
2	Trauma Centre and Emergency Medical Services(TCEMS)
3	Casualty
4	ICCU(Cardiology)
5	Neurology
6	Nephrology
7	Gastroenterology

8	Oncology
9	Endocrinology
10	Rheumatology
11	Psychiatry/Chest and TB/Dermatology

### **G. (b). Posting under “District Residency Programme” (DRP):**

All postgraduate students pursuing MD Medicine will undergo a compulsory rotation of three months in District Hospitals as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (2023). Such rotation will take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme and the rotation shall be termed as “District Residency Programme” and the PG medical student undergoing training shall be termed as “District Resident”.

District Resident will work under the overall direction and supervision of the District Residency Programme coordinator(DRPC).

DRPC shall issue certificate of satisfactory completion of DRP and report on performance of the district resident on prescribed format to be decided by the PDMEB to the concern medical college and the Govt. of state.

Satisfactory completion of the district residency will be an essential criteria to appear for university examination.

**G.(c) Training in Skill Lab:** During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, students will be trained in Skill Lab

**G.(d) Post Graduates are encouraged for e-learning activities**

### **Illustration of Structured Training**

Time Period	Description/Levels	Content	Responsibilities
Ist Month	Orientation	Basic cognitive Skills	- Combined duties - Supervised procedures

I year	Beginners	Procedural abilities OPD & ward work	<ul style="list-style-type: none"> <li>- History sheet writing</li> <li>- Clinical abilities,</li> <li>- Procedural abilities (PA,PI)*,</li> <li>-Laboratory-diagnostic(All PI)</li> <li>-Communication skills O,A,PA</li> <li>- BLS &amp; ACLS</li> </ul>
II <sup>nd</sup> Year	Intermediate	Intermediate degree of cognitive abilities  Specialised procedural skills  Emergency	<ul style="list-style-type: none"> <li>- Independent duties</li> <li>- All procedures</li> <li>- Respiratory management abilities (All PI)</li> <li>- Communication skills (PA, PI)</li> <li>- Writing thesis</li> <li>- Teaching UGs</li> </ul>
III <sup>rd</sup> year		Special skills  Intensive critical care	<ul style="list-style-type: none"> <li>- Advanced levels of independent duties,</li> <li>- casualty calls,</li> <li>- ICU,</li> <li>- UG teaching</li> </ul>

#### **N. Teaching research skills**

Writing a thesis will be used for inculcating research knowledge and skills. All postgraduate students will conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee will participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work.

#### **O. Training in teaching skills**

DOME will train PG students in education methodologies and assessment techniques. The PG students will conduct UG classes in various courses and a faculty shall observe and provide feedback on the teaching skills of the student.

#### **P. Maintenance of e-Log book**

During the training period, the postgraduate student should maintain a dynamic e-log book indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The log book entries must be done in real time.

It will be the duty of the Post graduate guide imparting the training to assess and authenticate the e-log book monthly basis.

The purpose of the Log Book is to:

- a) Help maintain a record of the work done during training,
- b) Enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
- c) Provide feedback and assess the progress of learning with experience gained periodically.
- d) Documentation of acquisition required competencies

The e-Log Book will be used in the internal assessment of the student; should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed e-log book in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination.

**Q. Course in Research Methodology:** All postgraduate students will complete an online course in Research Methodology within six months of the commencement of the batch and generate the online certificate on successful completion of the course.

**R. Other aspects**

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.
- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department will encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS).
- The Postgraduate trainees must undergo training in information technology and use of computers.



# ASSESSMENT

**FORMATIVE ASSESSMENT**, ie., assessment to improve learning

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

## General Principles

Internal Assessment will be done yearly to cover all domains of learning and used to provide feedback to improve learning. The Internal Assessment will be conducted in theory and practical/clinical examination including OSCE.

### **Quarterly assessment during the MD training should be based on:**

- Case presentation, case work up,  
case handling/management : once a week
- Journal club : once a month
- Seminar : once a month
- Case discussions : once a month
- Interdepartmental case or seminar : once a three months
- Attendance at Scientific meetings, CME programmes (at least 02 each)

**The student to be assessed periodically as per categories listed in appropriate postgraduate student appraisal form (Annexure I).**

**SUMMATIVE ASSESSMENT**, ie., assessment at the end of training

**Essential pre-requisites for appearing for examination include:**

1. Candidates will be allowed to appear for examination only if attendance is 80% at end of each academic year.

2. Have minimum one Poster presentation or Podium presentation at a National / Zonal / State Conference.
3. Have minimum one Research paper published in journal of his / her specialty as first author.
4. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
5. Complete a certification course in ethics including Good Clinical Practices and in the first year of the course conducted by institutions.
6. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
7. Thesis acceptance by all evaluators before the conduct of University
8. Performance in internal assessment should be satisfactory.
9. **E-Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.

The summative examination will be carried out as per the POSTGRADUATE MEDICAL EDUCATION REGULATIONS 2023. The theory examination shall be held in advance before the Clinical and Practical examination, so that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

The postgraduate examination shall be in three parts:

### **1. Thesis**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. A post graduate student will be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the external examiners.

Five percent of the mark of total marks of clinical/practical and viva voce marks (20marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. External examiner outside the state will evaluate dissertation/thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance of its viva voce.

## 2. Theory examination

The examinations will be organized on the basis of Marking system to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training, as given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS 2023.

1<sup>st</sup> and 2<sup>nd</sup> internal assessment(IA) will be carried out in the department at the end of 11 months and 23 months respectively.

3<sup>rd</sup> internal assessment will be prelims according to university norms.

**There will be four theory papers, each of three hours duration. Total marks of each paper will be 100.**

No of Questions	Marks for each question	Total Marks
10	10	100

Paper I	Basic Sciences as related to Medicine, Nutrition, Clinical Pharmacology, Emergency and Critical Care Medicine, Genetics.
Paper II	Central Nervous system, Diseases of Nerves and Muscles, Gastro Intestinal system, Hepatobiliary, Pancreatic disorders, Infectious diseases including tropical medicine, Geriatrics Medicine.
Paper III	Cardiovascular system, Respiratory system, Immunology, Connective tissue and joint disorders, Nephrology, Poisoning. Environmental and Occupational hazard, Pregnancy Medicine.
Paper IV	Recent advances in Medicine, Endocrinology & Metabolism (including bone and mineral metabolism), Hematology, Oncology, Dermatology and Psychiatry.

### 3. Practical/clinical and Oral/viva voce examination

#### Practical examination

Practical examination will include various major components of the syllabus focusing mainly on the psychomotor domain.

**Oral/Viva voce examination** on defined areas will be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain.

**PRACTICAL & VIVA VOCE = 400 MARKS**

**Practical =300**

Sl No		MARKS
1	Long Case	100
2	Short Cases (2)	50x2 =100
3	Emergency Case(1)	50
4	OSCE (5 stations)	5 x 6 = 30
5	Dissertation	20
6	Total	300

#### OSCE STATIONS

Five OSCE stations will be prepared as performance stations including

- Procedure stations; BLS, lumbar puncture, liver biopsy, kidney biopsy, Bone marrow aspiration, CVP line insertion, endotracheal intubation, etc.
- Communication stations;
- Interpretation session

The assessment will be done using checklist.

<b>VIVA VOCE=100</b>			
<b>Table I (25)</b>	<b>Table II (25)</b>	<b>Table III (25)</b>	<b>Table IV (25)</b>
• ECG	Instruments	Imaging	Drugs
• Specimens	Procedure	X-ray CT MRI	Emergencies/ Clinical trials /recent guidelines

#### **DISTRIBUTION OF MARKS FOR FINAL EXAMINATION**

##### **Maximum Marks**

<b>Maximum Marks for M.D. General Medicine</b>	<b>Theory</b>	<b>Practical</b>	<b>Viva Voce</b>	<b>Grand Total</b>
	<b>400</b>	<b>300</b>	<b>100</b>	<b>800</b>

#### **Criteria for evaluation of MD**

<b>Description</b>	<b>MD</b>
<b>THEORY</b>	
- No. of theory papers	04
- Marks for each theory paper	100
<b>Total marks for theory papers</b>	<b>400</b>
Passing minimum for theory	200/400(40% minimum in each paper)
<b>PRACTICALS</b>	<b>300</b>
- Dissertation	20
- OSCE	30(6x5)
- Long case	100
- Short case(2)	100(2x50)
- Emergency case(1)	50
<b>VIVA VOCE</b>	<b>100</b>

The candidate will secure not less than 50% marks in each head of passing which

shall include-

- 1) Theory- aggregate 50% (in addition, in each theory paper a candidate has to secure minimum of 40%)
- 2) Practical /clinical and Viva voce -aggregate 50%
- 3) If any candidate fails even under one head, he/she has to re-appear for both theory and practical/clinical and Viva voce examination.
- 4) No grace mark is permitted in exam

The examination for M.D will be held at the end of 3<sup>rd</sup> academic year.

The University shall conduct no more than 2 examinations in a year, with an interval not less than 4 months and more than 8 months between the two examinations.

### **RECOMMENDED BOOKS (LATEST EDITION)**

#### **I. Clinical Methods (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Clinical Methods	Hutchison	W. B. Saunders
2	Symptoms and Signs in Clinical Medicine	Chamberlain	Butterworth Heinemann
3	Clinical Examination	McLeod's	Elsevier
4	Neurological Examination in Clinical Practice	Bicker staff	Blackwell Science
5	Bedside Cardiology	Jules Consant	Little, Brown & Company
6	The Neurologic Examination	De'jong	Jaypee & Lippincott Williams & Wilkins
7	Clinical Medicine	Praveen Kumar Micheal Clark	Elsevier W. B. Saunders

8	Clinical Medicine	K.V.Krishna Das	Jaypee
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### I. General Medicine (Latest Edition)

Sl. No.	Name of the Textbook	Authors	Publisher
1	Principles of Internal Medicine	Harrison	McGraw Hill
2	Textbook of Medicine	API	API Mumbai
3	Textbook of Medicine	Cecil	W. B. Saunders
4	Textbook of Medicine	D. J. Weatherall J. Ledingham	Oxford University Press
5	Principles & Practice of Medicine	Davidson	Churchill Livingstone
6	Current Medical Diagnosis and Treatment,	Lawrence M. Tierney	McGraw Hill
8	Textbook of medicine	John Firth, Timothy Cox Christopher Conlon	Oxford University
9	The Washington Manual	Zachary Cries Cassandra Fritz	Wolters Kluwer

### III. Cardiology (Latest Edition)

Sl. No.	Name of the Textbook	Authors	Publisher
1	The Clinical Recognition of Congenital Heart Diseases	Josph K. Perloff	W. B. Saunders
2	An introduction to Electrocardiography	Leo Schamroth	Black Well Science
3	Practical Electrocardiography	Galen S. Wagner	Lippincott Williams & Wilkins (LWW)
4	Heart Disease	Eugene Braunwald	W. B. Saunders
5	The Heart	Hurst	McGraw Hill
6	Congenital Heart Disease in Adults	Perloff Child	W. B. Saunders

### IV. NEUROLOGY (LATEST EDITION)

Sl. No.	Name of the Textbook	Authors	Publisher
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1	Principles of Neurology	Adam's Victor & Ropper A. H.	Mc Graw Hill
2	Neurology in Clinical Practice	Bradley W. G. Daroff R. B.	Butterworth Heinenann (BH) publications
3	Neurological Differential Diagnosis	John Patten Walter	Springer
4	Diseases of the Nervous System	Walton & Donaghy	Oxford University Press
5	Brains Diseases of Nervous System	Michael Donaghy	Oxford University Press

### **V. Gastro-enterology (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Current Diagnosis and Treatment in Gastroenterology	Freedman S. L.	Lange Medical Publication
2	Diseases of Liver and Biliary System	Sheila Sherlock	Blackwell Sciences
3	Gastrointestinal and Liver Disease	Sleissenger & Fordtran's	W. B. Saunders
4	Diseases of the Liver	Schiff	Lippincott Williams & Wilkins (LWW)

### **VI. Nephrology (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	The Kidney	Brenner & Rector's	W. B. Saunders
2	Diseases of the Kidney & Urinary Tract	Robert W. Schrier	Lippincott Williams & Wilkins (LWW)
3	Textbook of Nephrology	Massry & Glassock	Williams & Wilkins

### **VII. Hematology (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Clinical Hematology	Wintrobe	Williams & Wilkins

### **VIII. Respiratory Medicine/ Critical Care Medicine (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Chest Medicine Essentials of Pulmonary and Critical Medicine	Ronald George	Williams & Wilkins



2	Manual of Intensive Care Medicine	Irwin and Rippe	Lippincott Williams & Wilkins (LWW)
3	Textbook of Respiratory Diseases	Crofton & Douglas	PG Publication Company

### **IX. Geriatrics/Gerontology (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Geriatric Medicine for students	Brocklehurst	Churchill Livingstone
2	Oxford Textbook of Geriatric Medicine	Evans	McGraw Hill

### **X. Oncology (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Cancer Principles and Practice of Oncology	Devita V. T.	Lippincott Williams & Wilkins (LWW)

### **XI. ENDOCRINOLOGY (latest edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Williams Text book of Endocrinology	Henry.M Kronenberg	Elsevier

### **Reference Books (Latest Edition)**

#### **Anatomy/ Physiology/ Biochemistry/ Biostatistics (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Clinical Neuroanatomy	Richards Snell	Lippincott Williams & Wilkins (LWW)
2	Textbook of Medical Physiology	Arthur C. Guyton	W. B. Saunders Company
3	Review of Medical Physiology	William F. Ganong	McGraw Hill
4	Biochemistry	Harper	Lange
5	Methods in Biostatistics	B. K. Mahajan	Jaypee
6	Biochemistry	Lippincott	Lippincott Williams & Wilkins (LWW)
7	Grays Anatomy	Henry Gray	Elsevier

#### **Pharmacology/ Microbiology/ Pathology (Latest Edition)**

Sl. No.	Name of the Textbook	Authors	Publisher
1	Textbook of Pharmacology	Brunton	McGraw Hill

2	Goodman and Gilman's-The Pharmacological basis of Therapeutics	Joel Griffith Hardman	McGraw Hill
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### RECOMMENDED JOURNALS:

Sl. No.	Name of the Journal
1	Journal of Association of Physicians of India (JAPI)- Monthly.
2	British Medical Journal (BMJ)- weekly
3	New England Journal of medicine- weekly.
4	The Lancet- weekly.
5	American journal of medicine –monthly.
6	Indian Journal of Tuberculosis- Quarterly.
7	Postgraduate Medical journal- Monthly.
8	Stroke- Monthly.
9	Neurology Clinic of North America Quarterly.
10	Indian Journal of Public Health- Quarterly.
11	Cardiology Clinics – Quarterly.
12	Heart – Monthly.
13	<b>JAMA- American Weekly.</b>
14	Indian Practitioner- Monthly.
15	The Practitioner – U.K. _ Monthly.
16	Indian- Heart Journal – Bimonthly.
17	National Medical Journal of India – Bimonthly.
18	<b>Medicine – Monthly- Edt. Allister. Vale.</b>
19	Clinics in Chest Medicine- Quarterly.
20	Antiseptic- Normal Journal- Monthly.
21	Bombay Hospital Journal – Quarterly.
22	<b>Medical Clinics of North America- Bimonthly.</b>
23	<b>Post-Graduate Medicine- Monthly.</b>
24	European Respiratory Journal- Monthly.
25	Indian Journal of Chest Diseases- Quarterly.
26	Indian Journal of Tuberculosis- Quarterly.
27	Brain- Monthly
28	Annals of Neurology- Monthly

29	Journal of Indian Medical Association- Monthly.
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03-05 international Journals and 02 national (all indexed) journals.

## Annexure 1

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**REVISED - COMPETENCY BASED  
POSTGRADUATE TRAINING PROGRAMME  
FOR MD IN PAEDIATRICS - 2024**

**PREAMBLE**

The purpose of any postgraduate (PG) education is to train a qualified MBBS doctor, to achieve competencies across all domains that enables the student to perform the professional role as an expert and specialist practicing a specialty in the community (Newborn to adolescent care; ambulatory and in-patient care; Well child/Healthy and Ill child; health promotion, disease prevention and curative care; individual and family centered care; emergency care, Intensive and routine Care). The shift towards competency-based medical education by Medical Council of India and continued by the National Medical Commission (NMC) focuses education to be outcome based, emphasizing abilities, balancing domains of learning and promoting a learner centered ownership of the curriculum.

The practice of medicine has and will continue to change. Existing changes in the environment and practice have included an explosion of information, stress on knowledge at the expense of skills/attitudes/critical thinking, increased access of information and health delivery systems by lay public, development and access to sub-specialties, technological and IT advances, costs of management (diagnostic and therapeutic), changes in disease trends (non-communicable diseases, behavioral/developmental disorders, malignancies, immunology, etc.), medico-legal litigations, emphasis on quality standards, improved patient safety, violence/anger against health personnel and the emergence of professional ethical dilemmas to name a few.

The NMC's competency-based education is organized using a framework of competencies (predefined abilities) that forms the backbone of the curriculum as defined outcomes. These competencies are defined as observable abilities of a health professional, integrating multiple components across all domains, cognitive, psychomotor skills, and affective. Identified competencies are to be measured and assessed to ensure their acquisition which in turn determines competence. Defined competencies in each domain facilitates education progressing from being a novice towards mastery with formative assessments (feedback) vital for success. Every domain will have weightage and the phenomenon of allowing the ability in one should not be allowed to compensate the lack of ability in another.

These changes are reflected in the review of Core Competencies keeping them mostly aligned with CBME Undergraduate efforts. Each competency will require Sub competencies/milestones enabling both student and teacher monitor progress that is transparent making both accountable. Specific Learning Objectives that will be necessary to achieve (and assess) outcomes are certainly also required to complete the process. This document has been prepared by subject-content specialists of NMC and will provide guidelines to teachers and learners to achieve defined outcomes through learning and assessment. The “domains of learning” are retained under the heading “competencies”.

## ***SUBJECT SPECIFIC OBJECTIVES***

### **Goals**

The goal of the MD Paediatrics post-graduate course on successful completion, is to mould the individual into a qualified Pediatrician who is a specialist doctor with the ability (competence) to assess the state of health; promote health; and diagnose as well as manage disease (acute or chronic, emergency or routine) in children of all ages from newborn to the adolescent.

Their expertise includes dealing with medical and surgical conditions of varied degrees of complexities providing a spectrum of care from prevention, promotion, resuscitation, emergency care, acute care, chronic care and procedures (diagnostic and therapeutic) including providing palliative care. Unlike in most adults, children go through changes in growth and development leading to anatomical, behavioral, and developmental changes that emphasizes that the Specialist incorporates this dynamic requirement into screening, assessments, diagnostic and therapeutic decisions. They will continue to play an important part in the health of the family and community especially through education and support of prevention of disease and health promotion since Paediatrics is child-centered and family focused given the relationships and social structures of families. Pediatricians will also continue to provide consultative services to many other physicians across the specialties including Emergency, Burns, Plastic Surgery, Anesthesiologist, Surgeons, Infectious Disease, Community and Family Medicine.

The objectives of the postgraduate course (MD) in Paediatrics are to produce a competent pediatrician who:

- Acquires competencies relevant to all aspects of Paediatrics (newborn to adolescent) that are essential to function as a clinical expert in providing newborn and pediatric health services for the community at all levels.
- Recognizes the holistic health needs of healthy neonates, infants, children and adolescents.
- Performs responsibilities of the provision of clinical care in keeping with principles of the National Health Policy.
- Performs responsibilities in a professional and ethical manner.
- Acquires skills in effectively communicating not only with the health team but with the child, family, and the community
- Is actively involved in keeping oneself up to date with scientific advances in Paediatrics and Medicolegal aspects of practice.
- Is oriented to principles of research methodology enabling critical appreciation of published scientific evidence and contributing through scholarship.
- Acquires skills to enable education of all stakeholders including health team members



- Acquires skills and understanding of dealing with health team members enabling optimizing system-based practice.

### ***SUBJECT SPECIFIC COMPETENCIES***

Towards achieving suitable outcomes certain Competencies are essential to be achieved, assessed that will enable the qualified professional to perform the role of a Paediatric Specialist. Aligned with the NMC's existing Undergraduate CBME, the following are refined and identified as themes or roles mandatory to perform the responsibility as a Pediatric Specialist in the community after acquiring an MD Paediatric post-graduation:

1. Clinical Expert
2. Communicator
3. Professional
4. Scholar
5. Team Member

#### **Core Competencies**

(The term 'children' is hereby used to include all age groups from birth to 18 years - newborn, neonates, infants, toddlers, children and adolescents)

To perform each of these above roles as a Paediatrician, every role determines competencies which in turn requires Specific Learning Objectives covering all the domains of learning.

By the end of the MD Paediatric course, the postgraduate student should be able to:

#### **1. Clinical Expert**

- 1.1. Appreciate and recognize maternal and child health needs in the context of the health priority of the country at all levels ie. Individual, Community, Local, Regional, and National.
- 1.2. Apply an understanding of the determinants of child health at individual, community, and population levels in practice of disease prevention, health promotion and clinical care of all children.
- 1.3. Understand the existing inequities in accessibility to child friendly health, economics of child health and existing status of child health across gender, communities, region, and nation (eg. NHFS survey).
- 1.4. Participate in population/community efforts towards prevention, promotion, and disease control relevant and with implications for child health (ie. National Health Programs).
- 1.5. Appreciate and recognize the importance of nurturing care for the early growth and development as the very foundation of Paediatrics and help each child realize her/his

optimal growth and development potential.

1.6. Actively support the optimization of quality of growth, development, and holistic health of children in care through education enhancing the promotive, preventive, and curative measures.

1.7. Provide continuum of care and rehabilitation for children afflicted by chronic disease.

1.8. Scientific Knowledge and Evidence

1.8.1. Apply an understanding of scientific basis, concepts, principles, and advances as the basis of health and disease in the screening, diagnosis, and management of all children including growth and development.

1.9. Clinical History/Examination

1.9.1. Demonstrate appropriate proficiency in basic clinical skills appropriate for children, ie. History, Physical Examination and Assessments of Growth/Development/ Behavior, in arriving at the most likely clinical differential; in identifying precipitating or predisposing factors; prioritizing high risk versus low-risk conditions; and, those in need of emergency versus routine care.

1.9.2. Organize and analyze an authentic history and relevant examination towards a valid clinical assessment of health of all children including growth, development, and behavioral assessments.

1.10. Investigations

1.10.1. Order rational Investigations and interpret results keeping in mind cost effectiveness and purpose in child health (ie., confirming diagnosis that impacts management decisions).

1.11. Procedures/Interventions

1.11.1. Order, perform with safety and interpret results of procedures/ interventions that are cost-effective for diagnostic and therapeutic purposes in child health.

1.12. Critical Thinking

1.12.1. Demonstrate a logical clinical approach to diagnose children in health and disease in all settings.

1.12.2. Manage using appropriate resources all children in health and disease in settings not less than secondary level facilities

1.12.3. Demonstrate clinical reasoning at every step from gathering, organization, prioritization, analysis and creating logical diagnostic hypothesis from clinical data relevant to childhood (history to examination to investigations)

1.12.4. Formulate rational, judicious, and cost-effective plans (Investigation, Therapeutic and Counseling/Education plans) for all children in health and

disease (acute and chronic) taking into consideration individual/ family circumstances, interpersonal dynamics, socioeconomic status, vulnerabilities, epidemiology, and population health factors.

1.12.5. Choose investigations and prescribes medications/interventions that are rational and cost-effective balancing benefits and costs in child health in the context of family status.

1.12.6. Critically appreciate scientific literature especially relevant to children under their care.

1.13. Responsiveness

1.13.1. Rapidly assess/screen, recognize and manage critically ill sick children prioritized for immediate attention.

1.13.2. Demonstrate sensitivity and appreciate the emotional and behavioral characteristics and needs of children while dealing with them

1.14. Quality of Care

1.14.1. Demonstrate practices that maximize child safety

1.14.2. Optimize safe working practices in child health delivery settings

1.14.3. Participate in incident reporting of adverse events and errors enabling quality improvement of child health

1.14.4. Participate in continuous Child Health Care related Quality Improvement measures especially patient related audits, recognition of gaps and implementation of interventions to improve quality

1.15. Advocacy

1.15.1. Responding to a Child's health needs by advocating for them

1.16. Documentation

1.16.1. Maintain Child health records of relevant demographic details clinical details, progress, interpretations, educational, monitoring and management decisions accurately and neatly organized

1.16.2. Provide relevant concise summaries and certification in completeness to authorized legal guardians of children

1.16.3. Maintain childhood morbidity and mortality data for audit purposes.

## **2. Communicator**

### **2.1. Effective Communication**

2.1.1. Demonstrate all aspects of effective and empathetic communication during most encounters with children and parents/guardians (listening skills,

culturally appropriate verbal and non-verbal cues, simple understandable language, allow questions, clarify answers and concise written communications for prescriptions and patient education)

- 2.1.2. Demonstrate mutually respectful communications with children/parents/guardians (verbal, telephonic, electronic and written) that is collaborative and effective between health system colleagues of all levels.

## 2.2. Effective Counselling

- 2.2.1. Provide professional assistance and guidance in assisting children/parents/authorized legal guardians determine their autonomous decisions regarding their own health (especially related Diagnostic Interventions and Therapeutic options).

## 3. Professional

### 3.1. Responsibility

- 3.1.1. Demonstrate responsibility for all aspects of the conduct of child care, academic tasks and research in children undertaken.
- 3.1.2. Demonstrate social accountability consistent with community and professional expectations through active participation in child health relevant Community Outreach programs
- 3.1.3. Demonstrate an understanding of one's own limits and seeks assistance appropriately in dealing with children in health and disease.

### 3.2. Integrity

- 3.2.1. Demonstrate commitment with honesty for consistent and uncompromising adherence to moral and ethical principles and values in protecting child rights and wellbeing during care, academics, and research.

### 3.3. Compassion and empathy

- 3.3.1. Demonstrate the ability to understand and share the feelings of children and families while dealing with them as care providers.
- 3.3.2. Demonstrate the ability to understand and share the feelings of health team members while working with them for the good of children.

### 3.4. Stigma and Discrimination

- 3.4.1. Demonstrate ability to comprehend the differences in values and beliefs while respectfully continuing child health care without discrimination

### 3.5. Ethical principles

- 3.5.1. Recognize ethical conflicts specific for child health between principles of ethics and justifies options/decisions while discussing within health care team

discussions.

3.5.2. Demonstrate respect for confidentiality in issues related to child health.

3.5.3. Demonstrate ability to honor the doctor-child/parent/legal guardian relationship in all dealings with respect ensuring due care especially avoiding all inappropriate behavior and activities that lead to conflicts of interest.

3.5.4. Demonstrate mutual respect for all members on the child health team and behaves equitably and collaboratively while dealing with them.

3.5.5. Demonstrate prioritization of child's welfare and community benefits over self when appropriate.

### 3.6. Medicolegal Law and Code of Ethics

3.6.1. Practice within the NMC's standards as prescribed by the Code of Ethics especially in dealings with children.

3.6.2. Practice within the Law of the land fulfilling legal requirements during the provision of care especially relevant to children.

## 4. Scholar

### 4.1. Research

4.1.1. Refer to evidence-based guidelines in the decision-making process for child care justifying limitations.

4.1.2. Understand research methodology and the creation of a research studies for child health.

4.1.3. Demonstrate the ability to critically appreciate the quality and implications of scientific literature justifying its application in the delivery of child health care.

4.1.4. Demonstrate an ability to identify pertinent research questions relevant to child health through active participation and involvement in research.

### 4.2. Academics

4.2.1. Demonstrate features of active adult learning through enthusiasm and displaying a positive attitude in the educational process while participating in educational activities to build child health care capacities (Intra- and inter-institutional).

4.2.2. Use appropriate educational techniques to promote health education amongst children/parents/legal guardians/community

4.2.3. Use appropriate educational techniques to facilitate learning of other child health care team members including undergraduates, nurses, para clinical staff and peers

4.2.4. Maintain competency by keeping up to date with child health guidelines

through continued medical education with scientific knowledge and skills to enable quality practice

#### 4.3. Application

- 4.3.1. Apply child health expertise in an area of study that is published in academic journals
- 4.3.2. Apply child health expertise while participating in health education and community efforts

### **5. Team Member**

#### 5.1. Teams

- 5.1.1. Demonstrate an understanding of the roles and competencies of other health care providers dealing with child health.
- 5.1.2. Demonstrate the ability to engage and collaborate with all child health care team members keeping the patient at the center of all such collaboration.
- 5.1.3. Recognize and discuss in a non-judgmental way the roles of informal stakeholders as extended teams especially in child care planning (especially mature adolescent, extended family, alternative medicine practitioners, support networks, etc.)
- 5.1.4. Demonstrate knowledge of health care financing, implications for management and its application in assisting patient to access the best possible care through extended team networking while dealing with child health.
- 5.1.5. Maintain personal health and wellbeing not only of self but of team members.

#### 5.2. Leaders

- 5.2.1. Demonstrate leadership and management skills enabling effective working as a child health team
- 5.2.2. Lead, manage, and participate as a member of an effective and efficient child health care team while collaborating respectfully either as leader or member.
- 5.2.3. Facilitate child health team capacity building of competencies by leading through conduct of effective education sessions for members of the health team learning.
- 5.2.4. Manage time and human resources efficiently and effectively to deliver optimal child health care.

## ***SYLLABUS***

Syllabus gives an outline and summary of topics to be covered in the MD Paediatric Course. In Competency Based Education, outcomes are required to be defined, taught, learnt, and assessed that determines competence at the end of the course. Defined Outcomes should focus on what is expected practically in the “real world” by the professional performing roles of the expert physician. This syllabus is focused on all age group of children from neonates to toddlers to children to adolescents as per existing practice. The syllabus thus stresses on “real world presentation of symptoms and signs” and is categorized under the following:

### **A. Cognitive Domain**

- a. Basic Sciences
- b. Approaches/Management of common symptoms/signs inclusive of analysis, interpretation, and application of investigations
- c. Specific Topics classified as per traditional systems

### **B. Psychomotor Domain**

### **C. Affective Domain**

### **D. Pedagogic and Research Skills**

## **A) Predominant in Cognitive (Knowledge) Domain**

### **a. Basic Sciences**

- Should be able to justify and apply in the practice of Paediatrics, an understanding of the fundamentals of basic sciences as listed below:

### **1. Applied Anatomy**

#### **1.1. Embryogenesis of all organ systems**

#### **1.2. Central Nervous System**

##### **1.2.1. Structures, Functions, Clinical considerations**

##### **1.2.1.1. Cerebral Cortex**

##### **1.2.1.2. Corticospinal tracts**

##### **1.2.1.3. Extrapyramidal tracts**

##### **1.2.1.4. Cerebellar connections**

##### **1.2.1.5. Sensory tracts**

##### **1.2.1.6. Ventricles**

### 1.3. Spinal Cord, Peripheral Nerves

#### 1.3.1. Structures, Functions, Clinical considerations

##### 1.3.1.1. Lower Motor Neuron

### 1.4. Bladder and Bowel control

### 1.5. Vascular supply – Principal arteries and veins

### 1.6. Extremities, Abdomen, Thorax, Head and Neck

### 1.7. Fetal circulation

## **2. Physiological basis and Pathophysiology in Health and Disease**

### 2.1. Physical Growth

### 2.2. Temperature regulation

### 2.3. Acid Base Balance

### 2.4. Fluid Balance

### 2.5. Hematopoiesis

### 2.6. Hemostasis

### 2.7. Electrolyte balance

### 2.8. Bone mineralization: Calcium-Phosphate balance

### 2.9. Puberty

### 2.10. Renal function

### 2.11. Hepatic function

#### 2.11.1. Bilirubin

#### 2.11.2. Drug metabolism

### 2.12. Respiratory function

### 2.13. Cardiac function

### 2.14. Gastrointestinal

### 2.15. Endocrine functions

### 2.16. Developmental Milestones

### 2.17. Adolescence

### 2.18. Placenta functions

### 2.19. Fetal to Infant Transitions (Cardio-respiratory)

### 2.20. Nutrition

### 2.21. Allergy



## **1. Biochemical basis of health and disease**

- 1.1. Cell biology
  - 1.1.1. Cell cycle
  - 1.1.2. Cell signaling
- 1.2. CHO metabolism
- 1.3. Lipid metabolism
- 1.4. Protein metabolism
- 1.5. TCA Cycle
- 1.6. Hemoglobin
- 1.7. Clinical Chemistry
  - 1.7.1. Vitamins
  - 1.7.2. Minerals
- 1.8. Plasma Proteins
- 1.9. Coagulation Pathway

## **2. Genetics and Molecular Medicine**

- 2.1. Human Genome
- 2.2. Nucleic acids
  - 2.2.1. Protein synthesis
- 2.3. Recombinant DNA Technology
  - 2.3.1. Basic techniques
  - 2.3.2. Applications
- 2.4. Chromosomal abnormalities
  - 2.4.1. Pedigree charting
- 2.5. Prenatal/Postnatal diagnosis
- 2.6. Immuno genetics
  - 2.6.1. HLA

## **3. Clinical Microbiology**

- 3.1. Virology
  - 3.1.1. Classifications

- 3.1.2. Diagnostics
  - 3.1.3. Therapeutics
  - 3.1.4. Resistance
- 3.2. Bacteriology
  - 3.2.1. Classification
  - 3.2.2. Endo/Exotoxins
  - 3.2.3. Diagnostics
  - 3.2.4. Therapeutics
  - 3.2.5. Resistance
  - 3.2.6. Antibiotic Stewardship
- 3.3. Mycology
  - 3.3.1. Classification
  - 3.3.2. Diagnostics
  - 3.3.3. Therapeutics
  - 3.3.4. Resistance
- 3.4. Parasitology (Protozoology and Helminthology)
  - 3.4.1. Classification
  - 3.4.2. Diagnostics
  - 3.4.3. Therapeutics
  - 3.4.4. Resistance
- 3.5. Waste disposal, sterilization, disinfection
  - 3.5.1. Infection Control

## **4. Immunology**

- 4.1. Immune response system
  - 4.1.1. Innate, Adaptive
  - 4.1.2. Cellular
  - 4.1.3. Antibodies
  - 4.1.4. Cytokines
  - 4.1.5. Clinical considerations
- 4.2. Immunoglobulin

## **5. Pharmacology**

- 5.1. Pharmacokinetics – common medications
- 5.2. Antimicrobials

- 5.3. Analgesia, sedation
- 5.4. Drug interactions
- 5.5. Adverse effects
- 5.6. Antidotes for poisons
- 5.7. Drug induced disease

## **6. Epidemiology**

- 6.1.1. Types
- 6.1.2. Clinical considerations
- 6.2. Complement
  - 6.2.1. Components
  - 6.2.2. Pathways
  - 6.2.3. Deficiencies
  - 6.2.4. Clinical considerations
- 6.3. Hypersensitivity reactions
- 6.4. Blood group Immunology
  - 6.4.1. ABO
  - 6.4.2. Rh
  - 6.4.3. Minor groups
- 6.5. Immunological assays
- 6.6. Science of Vaccinology
  - 6.6.1. Vaccines
  - 6.6.2. Classification
  - 6.6.3. Schedule
  - 6.6.4. Indications, contraindications
  - 6.6.5. Adverse effects
  - 6.6.6. Catch up doses
- 6.7. Immunodeficiency
  - 6.7.1. Primary
  - 6.7.2. Secondary
- 6.8. Autoimmune disease
  - 6.8.1. Basis
  - 6.8.2. Autoantibodies
  - 6.8.3. Clinical considerations

## 6.9. Transplant Immunology

### 6.9.1. Stem cell

### 6.9.2. GVH disease

### 6.9.3. Solid organ transplant

## 6.10. Cancer Immunology

## 6.11. Rates

## 6.12. Principles of study design

## 6.13. Measures of effects

## 6.14. Association and causation

## 6.15. Diagnostic tests

# 7. Statistics

## 7.1. Distribution of data

## 7.2. Measures of Central tendency

## 7.3. Measures of dispersion

## 7.4. Probability distributions

## 7.5. Sampling

## 7.6. Statistical significance

# 8. Professionalism and Ethics

## 8.1. Professionalism

### 8.1.1. Clinical competencies

### 8.1.2. Effective communication

### 8.1.3. Understanding of Ethics

### 8.1.4. Accountability

### 8.1.5. Altruism

### 8.1.6. Excellence

### 8.1.7. Humanism

## 8.2. Ethics

### 8.2.1. Code of ethics

### 8.2.2. Principles of Ethics

### 8.2.3. Ethical workup

### 8.2.4. Doctor-Patient relationship

### 8.2.5. Confidentiality and privacy

### 8.2.6. Doctor-Doctor relationship

## 8.3. Medico-legal essentials

- 8.3.1. POSCO
- 8.3.2. Certifications
- 8.3.3. Documentation
- 8.3.4. Informed consent
- 8.3.5. MLC formalities

## 9. Pedagogy

- 9.1. How adults learn
- 9.2. Competencies and Specific Learning Objectives
- 9.3. Teaching Learning Methodologies
- 9.4. T-L Media including Power Point Presentations
- 9.5. Assessments- Formative and Summative**

### **Management**

- 9.6. Time Management
- 9.7. Conflict Management
- 9.8. Communication especially Listening
- 9.9. How to study – Lectures? Wards? Journal club?
- 9.10. Fundamentals of Counselling
- 9.11. Stress Management
- 9.12. Teamwork
- 9.13. Leadership

**b. Approaches/Management of common symptoms/signs inclusive of analysis, interpretation, and application of investigations** (In every age group from newborn to adolescent) - **Approaches** (Clinical and Investigation) of the following clinical symptoms/ signs **Management** plans (Investigation, Treatment, Care, Counselling, Education, FollowUp, Rehabilitation Plans) of healthy children (section 1.1) and children with thefollowing clinical symptoms/signs.

## **1.1. Healthy Children**

- 1.1.1. Healthy neonate
- 1.1.2. Healthy infant
- 1.1.3. Healthy child
- 1.1.4. Healthy adolescent

## **1.2. Cardiovascular Symptoms/Signs**

- 1.2.1. Murmurs
- 1.2.2. Cyanosis
- 1.2.3. Syncope
- 1.2.4. Dizziness
- 1.2.5. Breathlessness
- 1.2.6. Palpitations
- 1.2.7. Chest Pain

### **1.3. Development (and Behavioral) Symptoms/ Signs**

- 1.3.1. Normal development
- 1.3.2. Delayed milestones
- 1.3.3. Regression of milestones
- 1.3.4. Unusual behaviors
- 1.3.5. Poor scholastic performance
- 1.3.6. Deviations in sexuality
- 1.3.7. Dysmorphic features
- 1.3.8. Suicide attempt
- 1.3.9. Behavioral issues -disinterest, isolation, poor social interaction
- 1.3.10. Substance abuse
- 1.3.11. Abnormal eating behavior
- 1.3.12. Sleep disturbance
- 1.3.13. Breath holding spells
- 1.3.14. Multiple unexplained unrelated complaints
- 1.3.15. Technology dependence
- 1.3.16. Speech abnormalities

### **1.4. Dermatology**

- 1.4.1. Neonatal skin lesions
- 1.4.2. Infantile skin lesions
- 1.4.3. Acquired skin rashes in childhood
- 1.4.4. Urticaria
- 1.4.5. Neurocutaneous presentations

### **1.5. Emergencies**

- 1.5.1. Dehydration
- 1.5.2. Respiratory distress

- 1.5.3. Hypoxia
- 1.5.4. Shock
- 1.5.5. Incessant crying
- 1.5.6. Sick looking
- 1.5.7. Status epilepticus
- 1.5.8. Acute Severe Asthma
- 1.5.9. Trauma
- 1.5.10. Animal/human bite
- 1.5.11. Abuse
- 1.5.12. Cardio-pulmonary failure
- 1.5.13. Oliguria/Anuria
- 1.5.14. Raised intracranial pressure
- 1.5.15. Coma
- 1.5.16. Traumatic Brain Injury
- 1.5.17. Acute poisoning
- 1.5.18. Envenomation
- 1.5.19. Medico-legal conditions

## **1.6. Endocrine Symptoms**

- 1.6.1. Abnormal stature
- 1.6.2. Hypoglycemia
- 1.6.3. Delayed puberty
- 1.6.4. Precocious puberty
- 1.6.5. Goiter

## **1.7. Gastrointestinal (and Hepatic) Symptoms**

- 1.7.1. Tongue tie
- 1.7.2. Vomiting and regurgitation
- 1.7.3. Diarrhea – Acute
- 1.7.4. Diarrhea – Chronic, persistent, recurrent
- 1.7.5. Abdominal pain – Acute
- 1.7.6. Abdominal Pain - Recurrent
- 1.7.7. Constipation
- 1.7.8. Jaundice
- 1.7.9. Gastrointestinal bleed
- 1.7.10. Hepatomegaly
- 1.7.11. Splenomegaly
- 1.7.12. Hepatosplenomegaly

- 1.7.13. Encopresis
- 1.7.14. Abdominal distention
- 1.7.15. Abnormal Liver Function tests

## **1.8. Genital Symptoms**

- 1.8.1. Atypical or ambiguous genitalia
- 1.8.2. Menstrual abnormalities
- 1.8.3. Injuries to genitalia
- 1.8.4. Foreskin, penile problems
- 1.8.5. Labial adhesions

## **1.9. Growth (and Nutrition related) Symptoms**

- 1.9.1. Normal growth
- 1.9.2. Normal diet
- 1.9.3. Poor feeding in Infancy
- 1.9.4. Undernutrition
- 1.9.5. Failure to thrive
- 1.9.6. Overweight and obesity

## **1.10. Hematological Symptoms**

- 1.10.1. Pallor
- 1.10.2. Bleeding manifestations
- 1.10.3. Lymphadenopathy
- 1.10.4. Thrombotic manifestations
- 1.10.5. Abnormal Hematological parameters including Pancytopenia

## **1.11. Infectious (and Immunological) Symptoms**

- 1.11.1. Fever with focus
- 1.11.2. Fever without focus
- 1.11.3. Fever - persistent or recurrent
- 1.11.4. Exanthematous Fever
- 1.11.5. Recurrent infections
- 1.11.6. Hospital acquired infection
- 1.11.7. Vaccination Issues— complete, incomplete

## **1.12. Metabolic Symptoms**



- 1.12.1. Acidosis – metabolic, respiratory
- 1.12.2. Alkalosis – metabolic, respiratory
- 1.12.3. Mixed Acid-Base disturbance
- 1.12.4. Dyselectrolytemia–Hypo/Hyponatremia,  
Hypo/Hyperkalemia, Hypo/hypercalcemia
- 1.12.5. Hyperammoniaemia
- 1.12.6. Hypoglycemia

### **1.13. Musculoskeletal Symptoms**

- 1.13.1. Joint pains with or without swelling
- 1.13.2. Low back pain
- 1.13.3. Deformities of bone growth
- 1.13.4. Scoliosis
- 1.13.5. Growing Pains involving lower limbs

### **1.14. Neonatology**

- 1.14.1. Term gestation
- 1.14.2. Prematurity
- 1.14.3. Low birth weight
- 1.14.4. Neonatal Jaundice
- 1.14.5. Ill/Sick
- 1.14.6. Neonatal seizures
- 1.14.7. Neonatal respiratory distress
- 1.14.8. Neonatal Apnea
- 1.14.9. Neonatal Shock
- 1.14.10. Metabolic/electrolyte disturbances –Glucose, Sodium,  
Potassium, Calcium, Bicarbonate, Lactate, Ammonia
- 1.14.11. Feed Intolerance
- 1.14.12. Spinal/Cranial abnormalities
- 1.14.13. Post NICU follow up
- 1.14.14. HIV-HepB-Syphilis exposure/infection
- 1.14.15. Inadequate breast milk
- 1.14.16. Antenatal detected renal abnormalities

### **1.15. Neurological Symptoms**

- 1.15.1. Seizures
- 1.15.2. Altered sensorium/Coma
- 1.15.3. Motor weakness

- 1.15.4. Incessant Irritability
- 1.15.5. Headache
- 1.15.6. Abnormal Head circumference
- 1.15.7. Sensory abnormalities
- 1.15.8. Abnormal gait
- 1.15.9. Ataxia
- 1.15.10. Facial weakness
- 1.15.11. Involuntary movements

#### **1.16. Ophthalmological Symptoms**

- 1.16.1. Red eye
- 1.16.2. Watering of eye
- 1.16.3. Discharge from eye
- 1.16.4. Poor vision
- 1.16.5. White reflex
- 1.16.6. Deviation of eyes

#### **1.17. Otorhino-laryngology Symptoms**

- 1.17.1. Nasal discharge, Nasal congestion, Sneezing
- 1.17.2. Sore Throat
- 1.17.3. Ear Pain/discharge
- 1.17.4. Tonsillar hypertrophy
- 1.17.5. Epistaxis
- 1.17.6. Impaired hearing

#### **1.18. Renal and Urological Symptoms**

- 1.18.1. Enuresis
- 1.18.2. Dysuria
- 1.18.3. Proteinuria
- 1.18.4. Hematuria
- 1.18.5. Edema
- 1.18.6. Hypertension
- 1.18.7. Dyselectrolytemia
- 1.18.8. Polyuria
- 1.18.9. Scrotal and Inguinal swelling
- 1.18.10. Oliguria/Anuria

#### **1.19. Respiratory Symptoms**

- 1.19.1. Cough
- 1.19.2. Breathlessness
- 1.19.3. Noisy breathing - snoring, stridor, wheeze
- 1.19.4. Hemoptysis

## **1.20 Community Situations**

- 1.19.5. Vaccination camps
- 1.19.6. School Health Checkups
- 1.19.7. Outbreaks of childhood diseases

## **1.21 Analysis, interpretation, and application of Investigations**

- 1.21.1. Radiology X-rays (Chest AP/PA/Lateral, abdomen, spine, extremities)
- 1.21.2. Contrast X-rays (Micturating cystourethrogram)
- 1.21.3. Ultrasound (Lung: Consolidation, Left Heart failure, effusion; Circulation: Intravascular Volume; Neonatal Brain: Hydrocephalus, Intracranial Collections; Central veins: Patency for US guided central lines; Lymphadenopathy: For US guided FNAC aspirations)
- 1.21.4. CT scan with/without contrast (Brain: Cerebral edema, Midline shift, Meningitis, Encephalitis, ADEM, Hemorrhage, Infarction, SOLS, Hydrocephalus)
- 1.21.5. MRI scan (Brain: Gross White vs Grey matter degeneration)
- 1.21.6. HIDA Scan

## **1.22. Microbiology**

- 1.22.1. Grams stain of CSF, Pus, Peritoneal fluid
- 1.22.2. Ziehl Neilson Stain of Sputum, Pus
- 1.22.3. Hanging drop for motile cholera
- 1.22.4. PCR reports for infectious disease diagnosis
- 1.22.5. Culture and sensitivity reports of body fluids

## **1.23. Pathology**

- 1.23.1. Pathology reports of human tissue

## **1.22. Routine labs**

- 1.22.1. Hematology reports of Blood counts, peripheral smear, Bleeding and Coagulation parameters, basic immunology
- 1.22.2. Urine routine analysis

## **1.22. Biochemical**

- 1.22.1. Biochemical routine (Electrolytes, Calcium-Phosphate, Renal, Liver profiles, Arterial/venous Blood Gases)
- 1.22.2. Inborn error of metabolism newborn screening reports
- 1.22.3. Endocrine (Glucose related, Thyroid related, Hormonal assays, Lipid profiles)

### **1.23. Electrophysiological Studies**

- 1.23.1. Electrocardiogram

### **1.24. Lung Function Tests**

- 1.24.1. Spirometry

## **C. *Specific Topics***

**Understanding the definition, epidemiology, etiopathogenesis, clinical presentation, investigations, complications, differential diagnosis, treatment, prognosis, prevention, follow up and rehabilitation, if required, of the following, but not limited to:**

### **1. Overview**

- 1.1. History of Paediatrics
- 1.2. State of Health of Children – Global, Regional and India
- 1.3. Evidence-based Care in Pediatrics
- 1.4. WHO's Sustainable Development Goals
- 1.5. National Programs relevant to Child Health
- 1.6. Ethics in the Care of Children
- 1.7. Medico-legal aspects relevant to Paediatrics including:  
Documentation (Initial History/Examination/Differential Sheet, Progress (SOAP, Problem Oriented), Death and other Certification, Informed Consent, Wound Certificates, POSCO, Financial Receipts, Outpatient/In Patient Registers)

### **2. Genetics**

- 2.1. Inheritance Patterns
- 2.2. Genetic Counseling
- 2.3. Prevention of Genetic Disorders  
Management of Genetic Disorders

### **3. Metabolic Disorders**

- 3.1. Approach to Inborn Errors of Metabolism
- 3.2. Approach to Hypoglycemia

- 3.3. Defects of Amino Acid Metabolism
  - 3.3.1. Phenylalanine
  - 3.3.2. Urea Cycle Disorders
- 3.4. Defects of Lipid Metabolism
  - 3.4.1. Organic Acidemias
  - 3.4.2. Fatty Acid Oxidation
  - 3.4.3. Mitochondrial Disorders
  - 3.4.4. Peroxisomal Disorders
  - 3.4.5. Lysosomal Storage Disorders
  - 3.4.6. Gaucher Disease
  - 3.4.7. Niemann-Pick Disease
- 3.5. Defects of Carbohydrate Metabolism
  - 3.5.1. Glycogen Storage Disease
- 3.6. GM1 and GM2 Gangliosidosis
- 3.7. Mucopolysaccharidoses
- 3.8. Porphyrrias
- 3.9. Newborn Screening
  - Immunology
- 3.10. Laboratory Diagnosis of Immune-mediated Diseases
- 3.11. Primary Immunodeficiency Disorders
  - 3.11.1. Antibodies
  - 3.11.2. Cellular
  - 3.11.3. Multiple types
    - 3.11.3.1. SCID (Severe combined immunodeficiency)
- 3.12. Phagocytic system
  - 3.12.1. Neutrophils
  - 3.12.2. Leukopenia
  - 3.12.3. Leucocytosis
- 3.13. Complement pathway
  - 3.13.1. Complement deficiencies
- 3.14. Intravenous Immunoglobulin
- 3.15. Multisystem Inflammatory Syndrome of Childhood

#### 4. Allergy

- 4.1. Basis of Allergy
- 4.2. Allergic rhinitis
- 4.3. Atopic dermatitis
- 4.4. Urticaria, Angioedema
- 4.5. Anaphylaxis
- 4.6. Asthma
- 4.7. Serum sickness
- 4.8. Drug allergies
- 4.9. Food allergies

#### 5. Fluid and Electrolytes

- 5.1. Body Fluids – Composition, Osmolality
- 5.2. Fluid Therapy - Maintenance, Replacement
- 5.3. Sodium
- 5.4. Potassium
- 5.5. Calcium
- 5.6. Magnesium
- 5.7. Phosphorus
- 5.8. Acid-base Abnormalities

## 6. Therapeutics

- 6.1. Principles of Drug Therapy
- 6.2. Administration of Medications
- 6.3. Pre-anesthesia Checkup
- 6.4. Procedural sedation
- 6.5. Analgesia

## 7. Acutely Ill

- 7.1. Assessment and Triage
- 7.2. Cardiopulmonary Resuscitation
  - 7.2.1. Basic Life Support
  - 7.2.2. Pediatric Advanced Life Support
- 7.3. Minor Injuries – Abrasions, Lacerations

## 8. Pediatric Intensive Care

- 8.1. Shock
- 8.2. Respiratory Failure
- 8.3. Pediatric Acute Respiratory Distress Syndrome
- 8.4. Ventilation – Non-Invasive and Invasive
- 8.5. Sedation, Analgesia and Paralysis
- 8.6. Nutrition in Intensive Care
- 8.7. ECMO
- 8.8. Concepts of Futility, do not Resuscitate, Withdrawal of Care
- 8.9. Palliative Care
- 8.10. Death

## 9. Toxins

- 9.1. Clinical Approach to a Poisoned Child
- 9.2. Poisonings by Common Drugs
- 9.3. Hydrocarbon Poisoning
- 9.4. Poisoning in the Household
- 9.5. Corrosive Poisoning
- 9.6. Snakebite

9.7. Insect Stings including Bee, Wasp, Scorpion Sting

10. Injuries

10.1. Poly Trauma: Stabilization, Triage, and Transport

10.2. Drowning/Submersion Injuries

10.3. Animal-related Injuries

10.4. Burn Injuries

10.5. Cold Injuries

11. Neonatology

11.1. Neonatal Mortality and Morbidities

11.2. Fetal Physiology and Growth

11.3. Maternal Influences on Fetus

11.4. Transition of the Fetus to Newborn

11.5. Intrauterine diagnosis and management of Fetal disease

11.6. Organization of Neonatal Care

12. Normal Newborn

12.1. Delivery Room Care of the Newborn

12.2. Newborn Resuscitation

12.3. Assessment of the Newborn

12.4. Care of the Normal Newborn

12.5. Maintenance of Temperature

12.6. Breastfeeding and Lactation Management

13. Disorders of Weight and Gestation in Neonates

13.1. Low Birthweight

13.1.1. Feeding of Low-birth weight

13.1.2. Intrauterine Growth Restriction

13.2. Prematurity

13.3. Post term

13.4. Large for Gestational Age



## 14. High-risk Newborn

- 14.1. Recognition of High-risk neonate
- 14.2. Multiple-gestational pregnancies
- 14.3. Birth Injuries
- 14.4. Perinatal Asphyxia
- 14.5. Jaundice in the newborn
- 14.6. Infant of Diabetic Mother
- 14.7. Neonatal Hypoglycemia
- 14.8. Anemia and Polycythemia
- 14.9. The Bleeding Neonate
- 14.10. Hemorrhagic Disease of the
- 14.11. Thrombocytopenia in the Newborn
- 14.12. Cyanosis in the Newborn
- 14.13. Necrotizing Enterocolitis
- 14.14. Retinopathy of Prematurity
- 14.15. Dyselectrolytemia, Hypocalcemia, Hypermagnesemia
- 14.16. Neonatal Transport
- 14.17. Follow-up of the High-risk Neonate

## 15. Neonatal Infections

- 15.1. Neonatal Sepsis – Early and Late
- 15.2. Superficial Infections in Neonates
- 15.3. Neonatal Meningitis
- 15.4. Deep-seated Infections in Neonates
- 15.5. Neonatal Tetanus
- 15.6. Intrauterine Infections

## 16. Neonatal Neurological Problems

- 16.1. Seizures in the Neonates
- 16.2. Hypoxic Ischemic Encephalopathy
- 16.3. Intra-cranial/ventricular Hemorrhage
- 16.4. Peripheral nerve injuries

17. Neonatal Respiratory Problems
  - 17.1. Approach to a Neonate with Respiratory Distress
  - 17.2. Neonatal Apnea Neonatal Ventilation
  - 17.3. Hyaline Membrane Disease
  - 17.4. Transient Tachypnea of the Newborn
  - 17.5. Meconium Aspiration Syndrome
  - 17.6. Pulmonary Air Leaks in the Newborn
  - 17.7. Persistent Pulmonary Hypertension (PPHN)
  - 17.8. Pulmonary Hemorrhage
  - 17.9. Bronchopulmonary Dysplasia
  - 17.10. Extra pulmonary air leaks
18. Neonatal Cardiac Problems
  - 18.1. Neonate with a murmur
  - 18.2. Patent ductus arteriosus
  - 18.3. Ductus dependent shunts
19. Hematological disorders in Neonates
  - 19.1. Anemia in Neonate
  - 19.2. Hemolytic Disease
  - 19.3. Polycythemia
  - 19.4. Hemorrhagic Disease
20. Congenital Malformations
  - 20.1. Esophageal Atresia and Tracheoesophageal Fistula
  - 20.2. Diaphragmatic Hernia and Eventration
  - 20.3. Gastrointestinal and Abdominal Malformation
  - 20.4. Genitourinary Malformations
  - 20.5. CNS Malformations
  - 20.6. Single Umbilical Artery, Polydactyly, Skin Tags
21. Growth: Normal and Abnormal
  - 21.1. Normal Growth

- 21.2. Factors Affecting Growth
  - 21.3. Assessment of Physical Growth
- 21.4. Disorders of Growth (Failure to Thrive, Overweight and Obesity)
- 21.5. Abnormalities of Stature

## 22. Development and Developmental Delay

- 22.1. Theories of Development and Behaviour
- 22.2. Laws of Development
- 22.3. Factors Affecting Development
- 22.4. Normal Development
- 22.5. Screening of Development and Behaviour
- 22.6. Approach to Diagnosis of Developmental Delay: Developmental Screening and Surveillance
- 22.7. Global Developmental Delay
- 22.8. Specific Developmental Delays
- 22.9. Cerebral Palsy
- 22.10. Intellectual Disability
- 22.11. Learning disabilities
- 22.12. Hearing Impairment
- 22.13. Mental Retardation

## 23. Behavior and Learning

- 23.1. Evaluation of Mental Well-Being
- 23.2. Psychosocial assessments
- 23.3. Technology Dependence
- 23.4. Bullying
- 23.5. Common Behavioral Problems
- 23.6. Tantrums and Breath-Holding
- 23.7. Enuresis and Encopresis
- 23.8. Sleep Medicine
- 23.9. Common Speech, Language, and Communication Disorders
- 23.10. Learning Disorders
- 23.11. Dyslexia

- 23.12. Attention-Deficit Hyperactivity Disorder
- 23.13. Oppositional Defiant and Conduct Disorders
- 23.14. Autism Spectrum Disorder
- 23.15. Rett Syndrome
- 23.16. Anorexia Nervosa and Bulimia
- 23.17. Anxiety Disorders
- 23.18. Suicide
- 23.19. Management of Psychological Illness

## 24. Nutrition and Nutritional Disorders

- 24.1. Nutritional Requirements
- 24.2. Nutritive Values of Indian Foods
- 24.3. Infant and Young Child Feeding
- 24.4. Adolescent Feeding
- 24.5. Feeding during Childhood and Food Allergy
- 24.6. Undernutrition: Prevalence and Etiology
- 24.7. Pathophysiology of Undernutrition
- 24.8. Malnutrition – Moderate and Severe Acute
- 24.9. Vitamin A
- 24.10. Vitamin B Complex
- 24.11. Vitamin C and Scurvy
- 24.12. Vitamin D, Nutritional Rickets, and Hypervitaminosis D
- 24.13. Iodine Deficiency Disorders
- 24.14. Zinc in Child Health
- 24.15. Trace Elements in Nutrition and Health
- 24.16. Fluorosis
- 24.17. Nutritional Rehabilitation including Diet Prescription
- 24.18. Enteral and Parenteral Nutrition
- 24.19. National Nutrition Programs

## 25. Immunization

- 25.1. Basic Concepts of Vaccination
- 25.2. Vaccine Administration Practices

- 25.3. Scheduling of Vaccines
- 25.4. Vaccine Storage and Cold Chain
- 25.5. Adverse Events following Immunization
- 25.6. BCG Vaccine
- 25.7. Poliovirus Vaccines
- 25.8. Diphtheria, Tetanus, and Pertussis Vaccines
- 25.9. Hepatitis B Vaccine
- 25.10. Haemophilus Influenzae Type B (HIB) Vaccines
- 25.11. Measles Vaccine
- 25.12. Rubella Vaccines
- 25.13. Mumps Vaccine
- 25.14. Typhoid Fever Vaccines
- 25.15. Japanese Encephalitis Vaccine
- 25.16. Rabies Vaccines
- 25.17. Pneumococcal Vaccines
- 25.18. Rotavirus Vaccines
- 25.19. Cholera Vaccines
- 25.20. Varicella Vaccine
- 25.21. Hepatitis A Vaccine
- 25.22. Meningococcal Vaccine
- 25.23. Seasonal and Pandemic Influenza Vaccines
- 25.24. Human Papillomavirus Vaccines
- 25.25. Dengue Vaccines
- 25.26. Yellow Fever Vaccine
- 25.27. Combination Vaccines
- 25.28. Covid-19 Vaccines
- 25.29. Immunization in Special Situations

## 26. Adolescence

- 26.1. Gender, Sexual Identity and Sexuality
- 26.2. Psychosocial Development

## 27. Health Issues in Adolescence

- 27.1. Factors Influencing Adolescent Health

- 27.2. Adolescent Nutrition
- 27.3. Mental Health
- 27.4. Injuries, Violence, and Suicide
- 27.5. Menstrual Disorders
- 27.6. Polycystic Ovary Syndrome
- 27.7. Teenage Pregnancy
- 27.8. Sexually Transmitted Infections
- 27.9. Substance Abuse
  - 27.9.1. Alcohol
  - 27.9.2. Tobacco
  - 27.9.3. Other substances
- 28. Care of the Adolescents
  - 28.1. Adolescent Counseling
  - 28.2. Promoting Health of Adolescents
  - 28.3. Adolescent Friendly Health Services
- 29. Infectious Diseases
  - 29.1. Epidemiology of Infectious Diseases
  - 29.2. Laboratory Diagnosis of Infection
  - 29.3. Microbiome and Child Health
  - 29.4. Antimicrobial Resistance
  - 29.5. Infection Control and Prevention
- 30. Fever
  - 30.1. Fever: General Principles of Management
  - 30.2. Fever with/without focus
  - 30.3. Fever of Unknown Origin
  - 30.4. Infections in Immunocompromised conditions
- 31. Bacterial Infections
  - 31.1. Natural History of Bacterial Infection
  - 31.2. Principles of Antibiotic Therapy
  - 31.3. Gram Positive Infections
    - 31.3.1. Streptococcal Infections

- 31.3.1.1. Pneumococcal Infections
- 31.3.1.2. Streptococcal Group A
- 31.3.1.3. Streptococcal Group B
- 31.3.1.4. Streptococcal Non A, Non B

- 31.3.2. Staphylococcal Infections
- 31.3.3. Enterococcus
- 31.3.4. Diphtheria
- 31.3.5. Nocardiosis
- 31.3.6. *Listeria monocytogenes*
- 31.3.7. Actinomycosis

#### 31.4. Gram Negative Infections

- 31.4.1. *Haemophilus influenzae*
- 31.4.2. *Neisseria*
- 31.4.3. *Pseudomonas*
- 31.4.4. Pertussis
- 31.4.5. *Salmonella*
  - 31.4.5.1. Nontyphoidal Salmonellosis
  - 31.4.5.2. Enteric Fever
- 31.4.6. *Shigella*
- 31.4.7. *Escherichia coli*
- 31.4.8. Cholera
- 31.4.9. *Campylobacter*
- 31.4.10. *Yersinia*
- 31.4.11. *Aeromonas*
- 31.4.12. *Brucella*
- 31.4.13. *Moraxella catarrhalis*
- 31.4.14. *Helicobacter pylori*

#### 31.5. Anaerobic Bacterial

- 31.5.1. *Clostridium tetani*
- 31.5.2. *Clostridium botulinum*
- 31.5.3. *Clostridium difficile*

### 31.6. Spirochetal Infections

31.6.1. Treponemapallidum

31.6.2. Leptospirosis

31.6.3. Borrelia

31.6.3.1. Lyme

31.6.3.2. Relapsing Fever

### 31.7. Mycoplasma

31.7.1. Mycoplasma pneumoniae

### 31.8. Chlamydia

31.8.1. Chlamydia pneumonia

31.8.2. Chlamydia trachomatis

31.8.3. Psittacosis

### 31.9. Rickettsia

31.9.1. Spotted Fever

31.9.2. Scrub Typhus

31.9.3. Typhus

31.9.4. Ehrlichiosis

31.9.5. Q fever

## 32. Mycobacterial Infections

32.1. Childhood Tuberculosis: Epidemiology,  
Pathogenesis, Clinical Features, and Prevention

32.2. Diagnostic Tools for Tuberculosis in Children

32.3. Antitubercular Drugs and RNTCP

32.4. Guidelines for Childhood Tuberculosis

32.5. Drug Resistant Tuberculosis

32.6. Atypical Mycobacterial Infections

32.7. Leprosy



### 33. Viral Diseases

33.1. Epidemiology of Viral Infections

33.2. Principles of Antiviral Drugs

33.3. Measles

33.4. Mumps

33.5. Rubella

33.6. Roseola

33.7. Epstein-Barr

33.8. Cytomegalovirus

33.9. Influenza

33.10. Parainfluenza

33.11. Respiratory syncytial virus

33.12. Human metapneumovirus

33.13. Rhinovirus

33.14. Adenovirus

33.15. Coronavirus

33.16. Rotavirus

33.17. Human Papillomavirus

33.18. Arbovirus

33.18.1. Japanese Encephalitis

33.18.2. Other Encephalitis

33.18.3. Tick-borne Encephalitis

33.18.4. Chikungunya

33.18.5. Zika

33.19. Varicella-zoster

33.20. Herpes Simplex

33.21. Rabies

33.22. Parvovirus Infections

33.23. Nonpolio Enteroviral Infections

33.24. Poliomyelitis

33.25. Viral Hepatitis

33.26. HIV

33.27. Human Lymphotropic 1 and 2

- 33.28. Dengue
- 33.29. Yellow Fever
- 33.30. Ebola, Hanta
- 33.31. Rabies
- 33.32. Viral Hemorrhagic Fevers
- 33.33. Covid-19

#### 34. Protozoal Disease

- 34.1. Epidemiology of Parasitic Infections
- 34.2. Principles of Antiparasitic therapy
- 34.3. Malaria
- 34.4. Leishmaniasis
- 34.5. Giardiasis
- 34.6. Amebiasis
- 34.7. Filariasis
- 34.8. Cryptosporidiosis
- 34.9. Toxoplasmosis
- 34.10. Helminthiasis
  - 34.10.1. Hookworm Infestation
  - 34.10.2. Ascariasis
  - 34.10.3. Trichuriasis
  - 34.10.4. Enterobiasis
  - 34.10.5. Strongyloidiasis
  - 34.10.6. Tapeworm Diseases
  - 34.10.7. Cysticercosis
  - 34.10.8. Trichinosis
  - 34.10.9. Toxocara
  - 34.10.10. Intestinal, Liver, and Lung Flukes
  - 34.10.11. Hydatid Disease: Echinococcosis
  - 34.10.12. Schistosomiasis

#### 35. Fungal Infections

- 35.1. Fungi
- 35.2. Principles of Antifungal Therapy

- 35.3. Candidiasis
- 35.4. Aspergillosis
- 35.5. Malassezia
- 35.6. Cryptococcosis
- 35.7. Coccidioidomycosis
- 35.8. Blastomycosis
- 35.9. Histoplasmosis
- 35.10. Mucormycosis
- 35.11. Pneumocystis Jirovecii

### 36. Diarrheal Illnesses

- 36.1. Acute Watery Diarrhea
- 36.2. Dysentery
- 36.3. Cholera
- 36.4. Persistent Diarrhea
- 36.5. Chronic *Diarrhea*
- 36.6. Antibiotic Associated Diarrhea

### 37. Gastrointestinal Disorders

- 37.1. Anatomy and Physiology
- 37.2. Common Symptoms of Gastrointestinal Diseases
- 37.3. Oral Cavity disorders
  - 37.3.1. Malocclusion
  - 37.3.2. Dental Caries
  - 37.3.3. Periodontal disease
  - 37.3.4. Common lesions of soft palate
  - 37.3.5. Cleft Lip and Cleft Palate
  - 37.3.6. Diseases of Salivary Glands
- 37.4. Esophageal atresia, Tracheoesophageal Fistula
- 37.5. Disorders of Esophageal Motility
- 37.6. Gastroesophageal Reflux
- 37.7. Esophagitis
- 37.8. Hiatal Hernia

37.9. Ingestions

37.9.1. Foreign Body

37.9.2. Caustic

37.10. Infantile Hypertrophic Pyloric Stenosis, Volvulus, Duplication

37.11. Duodenal Obstruction

37.12. Malrotation

37.13. Intestinal duplication

37.14. Meckel Diverticulum

37.15. Chronic obstructive pseudoobstruction

37.16. Chronic Abdominal Pain—Functional Abdominal Pain

37.17. Acid Peptic Disease

37.18. Pancreas – Function, Tests

37.18.1. Pancreatitis

37.18.2. Treatment of Pancreatic insufficiency

37.19. Constipation

37.20. Hirschsprung Disease

37.21. Malabsorption Disorders

37.21.1. Assessment

37.21.2. Celiac

37.21.3. Enzyme Deficiencies

37.22. Inflammatory Bowel Disease

37.23. Intestinal Obstruction

37.24. Intussusception

37.25. Appendicitis

37.26. Abdominal Tuberculosis

37.27. Ascites

37.28. Umbilical Hernia

37.29. Inguinal Hernia

37.30. Testicular Torsion

37.31. Anorectal Disorders

37.31.1. Anal Fissure

37.31.2. Hemorrhoids

37.31.3. Prolapse

37.31.4. Pilonidal sinus

37.31.5. Anorectal malformations

37.32. Cyclic vomiting

38. Hepatobiliary Diseases

38.1. Liver Function Tests

38.2. Neonatal Cholestasis

38.3. Portal Hypertension

38.4. Gastrointestinal Bleeding

38.5. Metabolic Liver disease

38.5.1. Wilson

38.5.2. Others

38.6. Liver Abscess

38.7. Viral Hepatitis

38.8. Chronic Liver Disease

38.9. Acute Liver Failure

38.10. Autoimmune Hepatitis

38.11. Drug induced Hepatitis

38.12. Cystic disease of Liver

38.13. Liver transplantation

38.14. Liver Tumors

38.15. Peritoneum

38.15.1. Ascites

38.15.2. Peritonitis

38.16. Epigastric hernia

39. Disorders of Hematopoietic System

39.1. The Hematopoietic System

39.2. Anemia: Etiology and Classification

39.3. Inadequate Production

39.3.1. Physiological anemia of infancy

- 39.3.2. Congenital Bone Marrow Failure
- 39.3.3. Aplastic Anemia
- 39.3.4. Iron Deficiency Anemia
- 39.3.5. Megaloblastic Anemia
- 39.3.6. Anemia of Chronic disease
- 39.3.7. Congenital dyserythropoietic anemia

#### 39.4. Hemolytic Anemia

##### 39.4.1. Hemoglobinopathies

###### 39.4.1.1. Sickle Cell Disease

###### 39.4.1.2. Thalassemia

##### 39.4.2. RBC Membrane Defects

##### 39.4.3. Red Blood Cell Enzyme Defects

##### 39.4.4. Immune Hemolytic Anemia

39.5. Polycythemia

39.6. Hemorrhagic and Thrombotic disorders

39.6.1. Coagulation Disorders

39.6.2. Hemophilia

39.6.3. Other Clotting Factor Deficiencies

39.6.4. Von Willebrand Disease

39.6.5. Thrombotic disorders

39.6.6. Disseminated Intravascular Coagulation

39.7. Platelet

39.7.1 Immune Thrombocytopenia

39.7.2 Hemolytic Uremic Syndrome

39.7.3 Thrombotic Thrombocytopenic Purpura

39.7.4 Kasabach- Merritt Syndrome

39.7.5 Platelet Function Defects

39.7.6 Blood Component Therapy

39.8. Spleen

39.8.1. Splenomegaly

39.8.2. Splenectomy

39.9. Lymphatics

39.9.1. Lymphadenopathy

39.9.2.Splenomegaly

39.9.3.Splenectomy

39.10. Lymphatics

39.10.1. Lymphadenopathy

## 40. Respiratory Diseases

- 40.1. Congenital Malformations of the Upper Respiratory Tract
- 40.2. Epistaxis
- 40.3. Nasal Polyps
- 40.4. Allergic Rhinitis
- 40.5. Otitis Media
- 40.6. Common Cold
- 40.7. Acute Pharyngitis
- 40.8. Retropharyngeal abscess
- 40.9. Sinusitis
- 40.10. Tonsils and Adenoids
- 40.11. Community Acquired Pneumonia
- 40.12. Pleural effusion, Empyema
- 40.13. Bronchiectasis
- 40.14. Pneumothorax, Pneumomediastinum, Pyopneumothorax
- 40.15. Skeletal deformities of Chest
- 40.16. Obstructive Sleep Apnea
- 40.17. Congenital Malformations of the Respiratory Tract
- 40.18. Congenital disorders of Lung
- 40.19. Croup, Epiglottitis, Laryngitis, Tracheitis
- 40.20. Bronchiolitis
- 40.21. Alpha-1 Antitrypsin Deficiency
- 40.22. Aspiration Syndromes
- 40.23. Preschool Wheeze and Bronchial Asthma
- 40.24. Aerosol Therapy
- 40.25. Pneumonia
- 40.26. Parapneumonic Effusion and Empyema
- 40.27. Pneumothorax and Air Leaks
- 40.28. Persistent and Recurrent Pneumonia
- 40.29. Interstitial Lung Disease
- 40.30. Hemoptysis and Alveolar Bleeds
- 40.31. Primary Ciliary Dyskinesia
- 40.32. Cystic Fibrosis
- 40.33. Bronchiectasis



- 40.34. Lung Abscess
- 40.35. Foreign Body Aspiration
- 40.36. Central Hypoventilation
- 40.37. Acute Respiratory Distress Syndrome
- 40.38. SIDS

#### 41. Cardiovascular Disorders

- 41.1. Genetic Basis of Heart Diseases
- 41.2. Chest Skiagram in Heart Disease
- 41.3. Electrocardiogram
- 41.4. Echocardiography
- 41.5. Congestive Heart Failure
- 41.6. Cardiac Malposition
- 41.7. Acyanotic Congenital Heart Disease, Left to Right shunt
  - 41.7.1. Ventricular Septal Defects
  - 41.7.2. Patent DuctusArteriosus
  - 41.7.3. Atrial Septal Defects
  - 41.7.4. PAPVC
  - 41.7.5. Atrioventricular Septal Defects
- 41.8. Acyanotic Congenital Heart Disease, Obstructive
  - 41.8.1. Pulmonary Valve Stenosis
  - 41.8.2. Coarctation of Aorta
  - 41.8.3. Pulmonary Venous Hypertension
- 41.9. Acyanotic Congenital Heart Disease, Regurgitation
  - 41.9.1. Mitral Valve Prolapse
- 41.10. Cyanotic Congenital Heart Disease, reduced Pulmonary flow
  - 41.10.1. Tetralogy of Fallot and Variants
  - 41.10.2. Tricuspid Atresia
  - 41.10.3. Double outlet Right Ventricle
  - 41.10.4. Ebstein Anomaly

41.11. Cyanotic Congenital Heart Disease, Increased Pulmonary flow

42.11.1. Transposition of Great Arteries and variants

42.11.2. Truncus Arteriosus

42.11.3. TAPVC Hypoplastic Left Heart Syndrome

41.12. Others

42.12.1. Anomalies of the Aortic Arch

42.12.2. Pulmonary Arterial Hypertension

41.13. Acquired Heart Disease

41.13.1. Acute Rheumatic Fever

41.13.2. Rheumatic Heart Disease

41.13.3. Infective Endocarditis

41.13.4. Myocardial Diseases: Myocarditis and Cardiomyopathies

41.13.5. Diseases of the Pericardium

41.13.6. Kawasaki disease

41.14. Cardiac Arrhythmias

41.15. Cardiac Emergencies

41.16. Heart Failure

41.17. Systemic Hypertension

42. Disorders of the Kidney and Urinary Tract

42.1. Investigations for Kidneys and Urinary Tract

42.2. Congenital Anomalies of Kidneys and Urinary Tract

42.2.1. Cystic Kidney Diseases

42.3. Glomerular Disease

42.3.1. Glomerulonephritis

42.3.1.1. Acute Poststreptococcal Glomerulonephritis

42.3.1.2. Membranous Nephropathy

42.3.1.3. Membranoproliferative Glomerulonephritis

42.3.1.4. Rapidly Progressive Glomerulonephritis

42.3.2. IgA nephropathy

42.3.3. Alport syndrome

42.4. Systemic Vasculitis and Lupus Nephritis

42.5. Goodpasture Disease

42.6. Henoch-Schonlein Purpura Nephritis

42.7. Hemolytic Uremic Syndrome

42.8. Toxic Nephropathy

42.9. Tubulointerstitial Disease

42.9.1. Pyelonephritis

42.9.2. Tubulointerstitial nephritis

42.9.3. Papillary necrosis

42.9.4. Acute Tubular Necrosis

42.10. Vascular Disease

42.10.1. Renal vein Thrombosis

42.10.2. Hypercalciuria

42.10.3. Nephrocalcinosis

42.10.4. Renal vein Thrombosis

42.10.5. Hypercalciuria

42.10.6. Nephrocalcinosis

42.11. Infections

42.11.1. Urinary Tract Infection

42.11.2. Cystitis

42.11.3. Urethritis

42.11.4. Hemorrhagic cystitis

42.11.5. Pyelonephritis

42.12. Proteinuria

42.12.1. Transient, Orthostatic

42.12.2. Nephrotic Syndrome

#### 42.13. Tubular Disorders

- 42.13.1. Renal Tubular Disorders
- 42.13.2. Nephrogenic Diabetes Insipidus
- 42.13.3. Bartter Syndrome
- 42.13.4. Gitelman Syndrome

#### 42.14. Renal Failure

- 42.14.1. Acute Kidney Injury
- 42.14.2. Chronic Kidney disease
- 42.14.3. End-stage renal disease
- 42.14.4. Renal Replacement Therapy
- 42.14.5. Renal Transplantation

#### 42.15. Renal Calculi

#### 42.16. Refractory Rickets

#### 42.17. Hypertension

#### 42.18. Vesicoureteral Reflux

#### 42.19. Voiding Disorders

#### 42.20. Penile anomalies

### 43. Gynecological Issues

#### 43.1. Vaginal bleeding in prepubertal children

#### 43.2. Breast concerns

#### 43.3. Female genital mutilation

### 44. Neurological Disorders

#### 44.1. Approach to Neurological Disorders including localization

#### 44.2. Cerebrospinal Fluid and Neurophysiology

#### 44.3. Neuroimaging

#### 44.4. Congenital Anomalies

- 44.4.1. Neural Tube Defects and Spinal Cord Malformations

#### 45.4.2. Microcephaly

- 45.4.3. Brain Malformations
- 45.4.4. Hydrocephalus
- 45.4.5. Craniosynostosis

44.5. Seizures

44.6. Febrile Seizures

44.7. Unprovoked Seizures and Epilepsy

44.7.1. Generalized

44.7.2. Focal

44.7.3. Reflex Seizures

44.8. Treatment of Seizures

44.9. Status Epilepticus

44.10. Nonepileptic Paroxysmal Disorders

44.11. Headaches

44.11.1. Migraine

44.11.2. Tension Headache

44.11.3. Secondary Headaches

44.12. Neurocutaneous Syndromes

44.13. Movement Disorders

44.14. Encephalopathies

44.14.1. Cerebral Palsy

44.14.2. Autoimmune

44.14.3. Mitochondrial

44.15. Neurodegenerative Disorders

44.15.1. Grey versus White Matter

44.15.2. Sphingolipidosis

44.15.3. Neuronal CeroidLipofuscinoses

44.15.4. Adrenoleucodystrophy

44.16. Demyelinating Disorders

45.11.1. Acute Disseminated Encephalomyelitis

45.11.2. Optic Neuritis

45.11.3. Transverse Myelitis

45.11.4. Multiple Sclerosis

45.11.5. Autoimmune and Paraneoplastic

45.12. Stroke

45.12.1. Arterial versus Venous

45.13. CNS Vasculitis

45.14. CNS Infections

45.14.1. Acute Pyogenic Meningitis

45.14.2. Tuberculosis of the Central Nervous  
System

45.14.3. Viral Meningoencephalitis

45.14.4. Neurocysticercosis

45.14.5. Brain Abscess

- 45.15. PseudotumorCerebri
- 45.16. Coma and Raised Intracranial Pressure
- 45.17. Brain Death
- 45.18. Infantile Tremor Syndrome
- 45.19. Neurometabolic Disorders
- 45.20. Spinal Cord Disorders
- 45.21. Traumatic Brain Injury
- 45.22. Neuro-Rehabilitation
  - 45.22.1. Traumatic Brain Injury
  - 45.22.2. Spinal cord Injury
  - 45.22.3. Spasticity
  - 45.22.4. Brachial plexus injury
  - 45.22.5. Meningomyelocele
  - 45.22.6. Disabled Child

#### 45. Neuromuscular Disorders

- 45.1. Approach to Diagnosis of Neuromuscular Disorders
- 45.2. Floppy Infant
- 45.3. Congenital Muscle Disorders
  - 45.3.1. Congenital Myopathies
  - 45.3.2. Arthrogryposis
- 45.4. Muscular Dystrophies
  - 45.4.1. Duchenne and Becker Muscular Dystrophy
  - 45.4.2. Myotonic Muscular Dystrophy
  - 45.4.3. Limb Girdle Muscular Dystrophy
  - 45.4.4. Fascio-scapulo-humeral Muscular Dystrophy
- 45.5. Endocrine/Toxic Myopathies
- 45.6. Metabolic Myopathies
  - 45.6.1. Periodic Paralysis
  - 45.6.2. Glucogenoses
  - 45.6.3. Mitochondrial

- 45.6.4. Lipid
- 45.7. Neuromuscular Transmission Disorders
  - 45.7.1. Myasthenia Gravis
  - 45.7.2. Spinal Muscular Atrophy
  - 45.7.3. Motor Neuron Disease
- 45.8. Hereditary Motor Sensory Neuropathies
  - 45.8.1. Peroneal Muscular Atrophy
  - 45.8.2. Refsum Disease
  - 45.8.3. Fabry Disease
  - 45.8.4. Leukodystrophy
  - 45.8.5. Acute Flaccid Paralysis
- 45.9. Toxic Neuropathies
- 45.10. Autonomic Neuropathy
- 45.11. Guillain-Barré Syndrome
- 45.12. Bell Palsy
- 46. Disorders of the Endocrine System
  - 46.1. Physiology of Neuroendocrinology
  - 46.2. Hypopituitarism
    - 46.2.1. Growth Hormone Deficiency and Resistance
    - 46.2.2. Polyuria, Diabetes Insipidus and Syndrome of Inappropriate Secretion of ADH
  - 46.3. Thyroid Disorders
    - 46.3.1. Thyroid Hormone Physiology
    - 46.3.2. Hypothyroidism
    - 46.3.3. Thyroiditis
    - 46.3.4. Hyperthyroidism
    - 46.3.5. Goiter and Thyroid Nodules
    - 46.3.6. Newborn Screening for Congenital Hypothyroidism
  - 46.4. Parathyroid Disorders
    - 46.4.1. Bone Mineral and Hormone Physiology



- 46.4.2. Calcium Disorders
- 46.4.3. Metabolic Rickets
- 46.4.4. Disorders with Bone Fragility
- 46.4.5. Hypoparathyroidism
- 46.4.6. Pseudo hypothyroidism
- 46.4.7. Hyperparathyroidism

#### 46.5. Pubertal Development

- 46.5.1. Normal Puberty
- 46.5.2. Delayed Puberty
- 46.5.3. Precocious Puberty

#### 46.6. Adrenal Gland Disorders

- 46.6.1. Normal Development and Physiology of the Adrenal Gland
- 46.6.2. Congenital Adrenal Hyperplasia
- 46.6.3. Adrenal Insufficiency
- 46.6.4. Cushing Syndrome
- 46.6.5. Primary Aldosteronism
- 46.6.6. Pheochromocytoma

#### 46.7. Gonad Disorders

- 46.7.1. Testicular Hypofunction
- 46.7.2. Ovarian Hypofunction
- 46.7.3. Gynecomastia
- 46.7.4. Disorders of Sex Development
- 46.7.5. Cryptorchidism and Micropenis

#### 46.8. Glucocorticoid Use and Withdrawal

#### 46.9. Diabetes Mellitus

- 46.9.1. Classification of Diabetes Mellitus
- 46.9.2. Type 1 Diabetes Mellitus
- 46.9.3. Type 2 Diabetes Mellitus
- 46.9.4. Acute and Chronic Complications of Diabetes Mellitus

- 46.10. Monogenic Obesity
- 46.11. Hyperlipidemia
- 46.12. Endocrine Consequences of Thalassemia Major
- 46.13. Endocrine Effects of Radiation and Cancer Chemotherapy
- 46.14. Adult Consequences of IUGR and Preterm Birth

#### 47. Malignancies in Children

- 47.1. Epidemiology and Biology of Cancers
- 47.2. Principles of Diagnosis and Therapy of Cancer
- 47.3. Leukemias
  - 47.3.1. Acute Lymphoblastic Leukemia
  - 47.3.2. Acute Myelogenous Leukemia
  - 47.3.3. Chronic Myelogenous Leukemia
  - 47.3.4. Infantile Leukemia
- 47.4. Lymphoma
  - 47.4.1. Hodgkin Lymphoma
  - 47.4.2. Non-Hodgkin Lymphoma
- 47.5. Brain Tumors
- 47.6. Neuroblastoma
- 47.7. Wilms Tumor
- 47.8. Soft Tissue Tumors
- 47.9. Bone Tumors
- 47.10. Retinoblastoma
- 47.11. Gonadal, Germ cell neoplasms
- 47.12. Hemangioma
- 47.13. Lymphangiomas, Cystic Hygromas
- 47.14. Thyroid Tumours
- 47.15. Nasopharyngeal Carcinoma
- 47.16. Adrenal Tumours
- 47.17. Histiocytosis
  - 47.17.1. LCH
  - 47.17.2. Hemophagocytic Lymphohistiocytosis

47.18. Oncological Emergencies and Supportive Care

47.19. Hematopoietic Stem Cell Transplant

48. Rheumatological Disorders

48.1. Approach to a Child with Rheumatological Disorder

48.2. Laboratory Investigations for Rheumatological Disorders

48.3. Drugs and Principles of Management for Rheumatic Disorders

48.4. Juvenile Idiopathic Arthritis

48.5. Reactive, Post-Infectious Arthritis

48.6. Systemic Lupus Erythematosus: Clinical Features and Diagnostic  
Criteria

48.7. Management of Systemic Lupus Erythematosus

48.8. Juvenile Dermatomyositis

48.9. Large Vessel Vasculitis: Takayasu Arteritis

48.10. Medium Vessel Vasculitis: Kawasaki Disease and  
Polyarteritis Nodosa

48.11. Small Vessel Vasculitis: Henoch-Schönlein Purpura and ANCA  
Associated Vasculitis

48.12. Juvenile Scleroderma

48.13. Antiphospholipid Syndrome

48.14. Growing Pains

49. Common Eye Abnormalities

49.1. Common Visual Problems

49.2. Congenital Anomalies

49.3. Refractive Errors

49.4. Cornea and Conjunctiva

49.5. Uveitis

49.6. Cataract and Lens

49.7. Glaucoma

49.8. Optic Nerve and Pupil

49.9. Strabismus and Motility Disorders

49.10. Eyelid, Orbit, and Lacrimal Sac

49.11. Ocular Injuries

49.12. Orbital Infections

49.13. Ocular Manifestations of Systemic Disorders

50. Common ENT Problems

- 50.1. Hearing Loss
- 50.2. Congenital malformations of Ear
- 50.3. External Otitis
- 50.4. Otitis Media
- 50.5. Mastoiditis
- 50.6. Inner Ear

51. Common Skin Problems

52. Skin of the Newborn: Physiological and Pathological Changes

- 52.1. Care of Skin in the Newborn
- 52.2. Infections and Infestations
- 52.3. Congenital Cutaneous Malformations
- 52.4. Vitiligo and Other Hypopigmentary Diseases
- 52.5. Atopic Dermatitis
- 52.6. Contact Dermatitis
- 52.7. Urticaria and Mastocytosis
- 52.8. Psoriasis, Gianotti-Crosti Syndrome
- 52.9. Acanthosis Nigra
- 52.10. Cutaneous Drug Reactions
- 52.11. Cutaneous Manifestations of Nutritional Deficiency
- 52.12. Cutaneous Manifestations of Collagen Vascular Diseases
- 52.13. Neurocutaneous Syndromes
- 52.14. Vesiculobullous Disorders
- 52.15. Papulosquamous Disorders
- 52.16. Ichthyosis
- 52.17. Genetic Cutaneous Disorders
- 52.18. Hair Disorders
- 52.19. Nail Disorders
- 52.20. Infections of Skin
  - 52.20.1. Impetigo
  - 52.20.2. Subcutaneous Infections

- 52.20.3. Staphylococcal Scalded Skin Syndrome
- 52.20.4. Ecthyma
- 52.20.5. Fungal Infections
- 52.20.6. Viral Infections
- 52.20.7. Arthropod bites
- 52.20.8. Scabies
- 52.20.9. Pediculosis
- 52.20.10. Acne

### 53. Disorders of Bones and Joints

- 53.1. Assessment of the Locomotor System
- 53.2. Deformities of Foot and Toes
  - 53.2.1. Congenital TalipesEquinovarus
- 53.3. Torsional deformities of Limb
- 53.4. Leg Length discrepancies
- 53.5. Transient Monoarticularsynovitis
- 53.6. Legg-Calvé-Perthes Disease
- 53.7. Neck Problems
  - 53.7.1. Torticollis
  - 53.7.2. Cervical anomalies
- 53.8. Scoliosis and Kyphosis
- 53.9. Developmental Dysplasia of the Hip (DDH)
- 53.10. Osteomyelitis
- 53.11. Septic Arthritis
- 53.12. Osgood-Schlatter Disease
- 53.13. Arthrogryposis
- 53.14. Injuries to Bones/Joints
- 53.15. Skeletal Dysplasia
- 53.16. Osteogenesisimperfecta
- 53.17. Marfan Syndrome
- 53.18. Metabolic Bone Disease

53.18.1. Hypo/Hyperphosphatemia

53.18.2. Osteoporosis

54. Vulnerable Children

54.1. Street Children

54.2. Child Labor

54.3. Child Abuse and Neglect

54.4. Adoption: Medical and Legal Issues

54.5. Rights of the Child

55. Environmental Health

55.1. Climate Change and its impact on Health

55.2. Air Pollution and its impact on Health

55.3. Biomedical Waste Management

56. Community Pediatrics

56.1. Indicators of Child Health

56.2. Environment and Child Health

56.3. Lead Poisoning

56.4. Adoption

56.5. Travel Medicine

56.6. Protection of Children from Sexual Offences ACT 2012

56.7. Rights of People With Disability Act 2016

56.8. National Programs for Child Health as relevant to National Health Mission including RBSK.

56.9. Integrated Management of Neonatal and Childhood Illness-Facility (IMNCI-F)

56.10. Investigation of an Outbreak

57. Quality Assessment and Improvement

58.1.1. Point of Care Quality Improvement

## **B.Psychomotor Domain**

- Should be able to perform independently in the practice of Paediatrics, the following diagnostic and therapeutic interventions as listed below:

### **1. Physical Examination**

- 1.1. Measurement of Vitals
- 1.2. Measurement of Anthropometry
- 1.3. General physical examination
- 1.4. Physical Examination of Systems
- 1.5. Development (Screening) Assessment
- 1.6. Behavioral (Screening) Assessment
- 1.7. Sexual Maturity Assessment
- 1.8. Newborn Assessment including gestational assessments
- 1.9. Breastfeeding Assessment of Position and Attachment
- 1.10. Motor Disability Assessment
  
- 1.11. Autism Spectrum Disorder Screening
- 1.12. Fundus examination
- 1.13. Middle ear examination
- 1.14. Throat examination
- 1.15. Triage - Rapid assessment of Airway, Breathing and Circulation
- 1.16. Hand hygiene
- 1.17. Biomedical Waste disposal guidelines

### **2. Non-Invasive Monitoring**

- 2.1. Pulse oximetry
- 2.2. Electrocardiogram
- 2.3. Vital Data Monitor

### **3. Procedures – Diagnostic**

- 3.1. Informed Consent
- 3.2. Aseptic measures for all invasive procedures
- 3.3. Sampling
  - 3.3.1. Venous blood

- 3.3.2. Arterial blood
- 3.3.3. Capillary blood
- 3.4. Vascular Access and cannulation
  - 3.4.1. Intravenous – Peripheral
  - 3.4.2. Intravenous - Central
  - 3.4.3. Intraosseous
  - 3.4.4. Intraarterial
  - 3.4.5. Umbilical Vein
- 3.5. Diagnostic Taps
  - 3.5.1. Pleural
  - 3.5.2. Peritoneal
  - 3.5.3. CSF
  - 3.5.4. Pericardial
  - 3.5.5. Joint fluid
  - 3.5.6. Subdural
  - 3.5.7. Ventricular
- 3.6. Urinary Catheterization
- 3.7. Urine collection
  - 3.7.1. Mid-stream sampling
  - 3.7.2. Catheter sampling
  - 3.7.3. Suprapubic puncture
- 3.8. Tuberculin Skin Test
- 3.9. Antibiotic Test Dose
- 3.10. Feeding/Ryles Tube
  - 3.10.1. Insertion
  - 3.10.2. Gastric Aspiration
  - 3.10.3. Feeds
  - 3.10.4. Stomach wash
- 3.11. Respiratory
  - 3.11.1. Naso, Pharyngeal and Nasopharyngeal swab collection
- 3.12. Suppository insertion
- 3.13. Per rectal exam
- 3.14. Inspection of Vulva/Vagina
- 3.15. Aspiration/Biopsy



- 3.15.1. Bone marrow
- 3.15.2. Liver
- 3.15.3. Kidney
- 3.15.4. FNAC Lymph node
- 3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)
- 3.17. Blood Group/Type
- 3.18. Smears
  - 3.18.1. Malaria Parasite Smear/Rapid Antigen Test
  - 3.18.2. Peripheral Blood Smear
  - 3.18.3. CSF/Pus Grams Stain
  - 3.18.4. Sputum Ziehl Neilson Smear
- 3.19. Urine dipstick
- 3.20. Stool Hanging drop
- 3.21. Glucometer Blood Sugar
- 3.22. Shake test (Newborn gastric aspirate)
- 3.23. Electrocardiogram
- 3.24. Specific Screening/Assessment Tools
  - 3.24.1. Gestation Assessments
  - 3.24.2. Anthropometric measurements and Growth charting
  - 3.24.3. Peak Flow Meter Measurement
  - 3.24.4. HEADSS screening (Adolescence)
  - 3.24.5. DDST screening (Development Assessment)
  - 3.24.6. Assessment of Sexual Maturity using Tanner's
  - 3.24.7. M-CHAT-R screening (Autism Assessment)
  - 3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)
  - 3.24.9. Pain assessment

#### **4. Procedures – Therapeutic**

- 4.1. Informed Consent
- 4.2. Prescriptions/Medication Orders
- 4.3. Neonatal Resuscitation Program including intubation
- 4.4. Basic Life Support
- 4.5. Advanced Paediatric Life Support including intubation

4.6. Heimlich, Foreign Body Removal

4.7. Exchange Transfusion

4.8. Stomach wash

4.9. Injections

4.9.1. Intravenous

4.9.2. Intramuscular

4.9.3. Subcutaneous

4.9.4. Intradermal

4.10. Infusions

4.10.1. IV bolus

4.10.2. Intravenous

4.10.3. Intraosseous

4.10.4. Blood Component Transfusion

4.11. Respiratory

4.11.1. Meter dose inhalation with or without Spacer/Mask

4.11.2. Nebulization

4.11.3. Airway Insertion – Nasopharyngeal, Oropharyngeal

4.11.4. Needle Cricothyroidotomy

4.11.5. Oxygen delivery methods

4.11.6. HFNC/CPAP/Non-Invasive Ventilation

4.11.7. Ventilation – Conventional

4.11.8. Intercostal drainage

4.11.9. Surfactant Administration (INSURE)

4.12. Spinal infusion/injection

4.13. Therapeutic Ascitic Tap

4.14. Peritoneal dialysis

4.15. Phototherapy

4.16. Incision and Drainage

4.17. Dressings

4.18. Sling

4.19. Transport onto and off stretcher

4.20. Neonatal Temperature Warm Chain Measures

4.20.1. Wrapping up Newborn

4.20.2. Kangaroo Mother Care

4.21. Immunization Cold Chain Measures

4.21.1. Refrigerator

4.21.2. Vaccine carrier

4.22. Restraining a child

4.23. Transporting a child

4.24. Early Interventional Therapy

4.25. Chest Physiotherapy

### Milestones to be achieved on Psychomotor Skills through Year 1 to 3.

**O-Observe**

**PS-Perform under supervision**

**PI-Perform Independently**

<b>Milestones</b>	<b>1<sup>st</sup> Year</b>	<b>2<sup>nd</sup> Year</b>	<b>3<sup>rd</sup> Year</b>
<b>1. Physical Examination</b>			
1.1.Measurement of Vitals	PI		
1.2. Measurement of Anthropometry	PI		
1.3. General physical examination	PI		
1.4. Physical Examination of Systems	PI		
1.5. Development (Screening) Assessment	O, PS	PI	
1.6. Behavioral (Screening) Assessment	O	PS	PI
1.7. Sexual Maturity Assessment	O, PS	PI	
1.8. Newborn Assessment including gestational assessments	PI		
1.9. Breastfeeding Assessment	PI		
1.10. Motor Disability Assessment	O	PS	PI
1.11. Autism Spectrum Disorder Screening	O	PS	PI
1.12. Fundus examination	PI		
1.13. Middle ear examination	PI		
1.14. Throat examination	PI		
1.15. Triage - Rapid assessment of ABC	PI		
1.16. Hand hygiene	PI		
1.17. Biomedical Waste disposal guidelines	PI		
<b>2. Non-Invasive Monitoring</b>			
2.1. Pulse oximetry	PI		
2.2. Electrocardiogram	PI		
2.3. Vital Data Monitor	PI		
<b>3. Procedures – Diagnostic</b>			
3.1. Informed Consent	PI		
3.2. Aseptic measures for all procedures	PI		

3.3. Sampling			
3.3.1. Venous blood	PI		
3.3.2. Arterial blood	PI		

3.3.3. Capillary blood	PI		
3.4. Vascular Access and cannulation			
3.4.1. Intravenous – Peripheral	PI		
3.4.2. Intravenous - Central	O	PS	PI
3.4.3. Intraosseous	PI		
3.4.4. Intraarterial	O	PS	PI
3.4.5. Umbilical Vein	PI		
3.5. Diagnostic Taps			
3.5.1. Pleural	PS	PI	
3.5.2. Peritoneal	PI		
3.5.3. CSF	PI		
3.5.4. Pericardial	O	PS	PI
3.5.5. Joint fluid	O	PS	PI
3.5.6. Subdural	O, PS	PI	
3.5.7. Ventricular	O	PS	PI
3.6. Urinary Catheterization	PI		
3.7. Urine collection			
3.7.1. Mid-stream sampling	PI		
3.7.2. Catheter sampling	PI		
3.7.3. Suprapubic puncture	PI		
3.8. Tuberculin Skin Test	PI		
3.9. Antibiotic Test Dose	PI		
3.10. Feeding/Ryles Tube			
3.10.1. Insertion	PI		
3.10.2. Gastric Aspiration	PI		
3.10.3. Feeds	PI		
3.10.4. Stomach wash	PI		
3.11. Respiratory			

3.11.1. Naso, Pharyngeal, NP swab Collection	PI		
3.12. Suppository insertion	PI		
3.13. Per rectal exam	O	PS	PI

3.14. Inspection of Vulva/Vagina	PI		
3.15. Aspiration/Biopsy			
3.15.1. Bone marrow	O, PS	PI	
3.15.2. Liver	O	PS	PI
3.15.3. Kidney	O	PS	PI
3.15.4. FNAC Lymph node	O	PS	PI
3.16. Ultrasound – Lung (B line, Effusion), Circulation (IVC Volume), Vascular access (Central venous), Soft Tissue (Pus)	O	O, PS	PS
3.17. Blood Group/Type	O, PS	PI	
3.18. Smears			
3.18.1. Malaria Parasite Smear/Rapid Antigen Test	O, PS	PI	
3.18.2. Peripheral Blood Smear	O, PS	PI	
3.18.3. CSF/Pus Grams Stain	O, PS	PI	
3.18.4. Sputum Ziehl Neilson Smear	O, PS	PI	
3.19. Urine dipstick	PI		
3.20. Stool Hanging drop	O, PS	PI	
3.21. Glucometer Blood Sugar	PI		
3.22. Shake test (Neon gastric aspirate)	PI		
3.23. Electrocardiogram	PI		
3.24. Specific Screening/Assessment Tools			
3.24.1. Gestation Assessments	PI		
3.24.2. Anthropometric measurements and Growth charting	PI		

3.24.3. Peak Flow Meter Measurement	PI		
3.24.4. HEADSS screening (Adolescence)	O, PS	PI	
3.24.5. DDST screening (Development Assessment)	O, PS	PI	
3.24.6. Assessment of Sexual Maturity using Tanner's	O, PS	PI	
3.24.7. M-CHAT-R screening (Autism Assessment)	O	PS	PI
3.24.8. GMSCF Assessment of Motor Disability (Cerebral Palsy)	O	PS	PI

3.24.9. Pain assessment	PI		
<b>4. Procedures – Therapeutic</b>			
4.1. Informed Consent	PI		
4.2. Prescriptions/Medication Orders	PI		
4.3. Neonatal Resuscitation Program including ET	PI (BVM)	PI (ET)	
4.4. Basic Life Support	PI		
4.5. Advanced Paediatric Life Support including ET	PI (BVM)	PI (ET)	
4.6. Heimlich, Foreign Body Removal	PI		
4.7. Exchange Transfusion	O	PS	PI
4.8. Stomach wash	PI		
4.9. Injections			
4.9.1. Intravenous	PI		
4.9.2. Intramuscular	PI		
4.9.3. Subcutaneous	PI		
4.9.4. Intradermal	PI		
4.10. Infusions			
4.10.1. IV bolus	PI		
4.10.2. Intravenous	PI		

4.10.3. Intraosseous	PI		
4.10.4. Blood Component Transfusion	PI		
4.11. Respiratory			
4.11.1. Meter dose inhalation with or without Spacer/Mask	PI		
4.11.2. Nebulization	PI		
4.11.3. Airway Insertion – Nasophary, Orophary	PI		
4.11.4. Needle Cricothyroidotomy	O	PS	PI
4.11.5. Oxygen delivery methods	PI		
4.11.6. HFNC/CPAP/Non-Invasive Ventilation	O, PS	PI	
4.11.7. Ventilation – Conventional, High Freq (HFV)	O	PS	PI (Not HFV)
4.11.8. Intercostal drainage	O, PS	PI	
4.11.9. Surfactant Administration	O, PS	PI	



(INSURE)			
4.12. Spinal infusion/injection	O	PS	PI
4.13. Therapeutic Ascitic Tap	O, PS	PI	
4.14. Peritoneal dialysis	O	PS	PI
4.15. Phototherapy	PI		
4.16. Incision and Drainage	O	PS	PI
4.17. Dressings	PI		
4.18. Sling	PI		
4.19. Transport onto and off stretcher	PI		
4.20. Neonatal Temperature Warm Chain	PI		
4.20.1. Wrapping up Newborn	PI		
4.20.2. Kangaroo Mother Care	PI		
4.21. Immunization Cold Chain Measures			
4.21.1. Refrigerator	PI		
4.21.2. Vaccine carrier	PI		
4.22. Restraining a child	O, PS	PI	
4.23. Transporting a child	O, PS	PI	
4.24. Early Interventional Therapy	O	PS	PI
4.25. Chest Physiotherapy	O, PS	PI	

### C. Predominant in Affective Domain

*Should be able to effectively and empathetically.....*

#### 1. Communication – Child/Attender/Guardian

- 1.1. Elicit a relevant and appropriate history from an attender/child including family and support systems
- 1.2. Engage and explains in appropriate language the plan (diagnostic and management including economics of plans) to an attender/child
- 1.3. Explain the prognosis of the child's condition
- 1.4. Educate a Parent, an attendant/guardian/child with regards disease/, cultural, and spiritual understanding associated with health care delivery complication prevention, health promotion, and management.

**1.5.** Counsel towards an Informed Consent/Assent

**1.6.** Communicate disturbing/bad news including death

**1.7.** Demonstrates communication skills to appropriately word reports, professional opinions, patient education and counseling with regards

1.7.1. Health and Disease condition with management plan

1.7.2. Nutrition - Breastfeeding, complimentary feeding and nutrition using a Growth chart

1.7.3. Immunization – On schedule, catch up including costs and advantages/disadvantages

1.7.4. Lifestyle

1.7.4.1. Dietary

1.7.4.2. Habits

1.7.5. Genetic risks of relevant inherited conditions

1.7.6. Options for management and future approach in care with advantages and disadvantages

1.7.7. Rights and responsibilities

**1.8.** Demonstrates knowledge or applies an understanding of psychological, social, and economic factors which are pertinent to the delivery of health care.

**1.9.** Demonstrates and effectively engages the patient and / or family in all communication.

**1.10.** Demonstrates ability to provide patient, family and community education through written material especially simple patient information leaflets

**Should be able to effectively and respectfully.....**

## **2. Communication – Health Team members**

**2.1.** Communicate with all members of the health care team

**2.2.** Communicate with other members of the profession

**2.3.** Communicate with allied professionals associated with Health care

**Should be able to ....**

### **3. Professionalism and Ethical Behaviour**

#### **3.1. Demonstrates Professional Conduct in patient care and research**

- 3.1.1. Demonstrate respect for the Doctor-Patient relationship
- 3.1.2. Demonstrate respect for the Doctor-Health Care Team Member relationship
- 3.1.3. Demonstrate adherence to confidentiality and patient privacy in all communications in and outside the place of work.
- 3.1.4. Demonstrate respect of a patient's rights and decisions including the right to information and second opinion.
- 3.1.5. Demonstrate behaviour aligned with MCI/NMC code of ethics in all related dealings
- 3.1.6. Demonstrates personal and social responsibility/accountability in the provision of health care at an individual, community and population level
- 3.1.7. Demonstrate an awareness of economic costs of health care in all dealings with patients.
- 3.1.8. Demonstrate adherence to research ethics guidelines in the conduct of patient related research.
- 3.1.9. Demonstrates work ethics while working in a health care team.
- 3.1.10. Demonstrates truthfulness, honesty and integrity in all interactions.
- 3.1.11. Provides care that surpasses personal beliefs and prejudices
- 3.1.12. Demonstrates appropriate etiquette in dealings with patients, relatives and other health personnel

#### **3.2. Demonstrates behavior that is Ethical and bound by the Law of the land**

- 3.2.1. Recognizes Ethical conflicts and dilemmas seeking solutions to reduce conflicts and do the right thing.
- 3.2.2. Complies with legal requirements while dealing with child health and includes issues dealing with the Industry Conflict, MTP Act, PCPNDT act, Child Abuse, Child labour, Legal adoption, Consent and Assent.

## **D. Pedagogic and Research Skills**

**Should be able to effectively .....**

### **1. Pedagogic Skills**

- 1.1.** Conduct a small group learning session (Theory and Practical) using appropriate tools
- 1.2.** Create and use an effective Powerpoint Presentation
- 1.3.** Present to a large group

**Should be able to effectively .....**

### **2. Research Skills**

- 2.1.** Search scientific literature and critically appraise the evidence using standard study design checklists enabling application to clinical care.
- 2.2.** Justify the application of the findings of a research study in clinical practice (Diagnostic and Therapeutic Studies)
- 2.3.** Develop a research hypothesis supported by scientific literature review, design an appropriate study, implement the methodology, generate results by analyzing data, and draw appropriate conclusions.
- 2.4.** Should be able to present or/and publish a paper based on the conducted research.

## ***TEACHING AND LEARNING METHODS***

### **General principles**

Acquisition of competencies being the keystone of doctoral medical education, ~~such~~ the training in paediatric postgraduation is skill oriented. Learning in the program is essentially autonomous and self-directed, and emanating from academic and clinical work, also includes assisted learning. The formal sessions are meant to supplement this core effort.

All students joining the postgraduate (PG) course shall work as full-time (junior) residents during the period of training, attending not less than 80% of the training activity during the calendar year, and participating in all assignments and facets of the educational process. They shall maintain a e-logbook for recording the training they have undergone, and details of the

procedures done during laboratory and clinical postings in real time.

### **Teaching-Learning methods**

This should include a judicious mix of demonstrations, symposia, journal clubs, clinical meetings, seminars, small group discussion, bed-side teaching, case-based learning, simulation-based teaching, self-directed learning, integrated learning, interdepartmental meetings and any other collaborative activity with the allied departments. Methods with exposure to the applied aspects of the subject relevant to basic/clinical sciences should also be used. **The suggested teaching-learning methods are given below.**

**A. Lectures:** Didactic lectures should be used sparingly. A maximum of 10 lectures per year in the concerned PG department is suggested. All postgraduate trainees are encouraged to attend such lectures. Lectures can cover topics such as:

1. Subject-related important topics as per Paediatric requirements
2. Recent advances
3. Research methodology and biostatistics
4. Undergraduate/Postgraduate medical curriculum
5. Teaching and assessment methodology.

Topic numbers 3, 4, 5 can be done during research methodology/biostatistics and medical education workshops in the institution.

**B. Journal club:** Recommended to be held **once a week**.

Topics will include presentation and critical appraisal of original research papers published in peer reviewed indexed journals. The presenter(s) shall be assessed by faculty and grades recorded in the logbook. A time table with names of the students and the moderator should be announced in advance.

**C. Student Seminar:** Recommended to be held **once a week**.

Important topics should be selected as per subject requirements and allotted for in-depth study by a postgraduate student. A teacher should be allocated for each seminar as faculty moderator to help the student prepare the topic well. It should aim at comprehensive complete evidence-based review of the topic. The student should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of

postgraduates. A time table for the subject with the names of students and moderator should be announced in advance.

**D. Student Symposium:** Minimum of once every 3 months.

A broad topic of significance should be selected, and each part shall be dealt by one postgraduate student. A teacher moderator should be allocated for each symposium and moderator should track the growth of students. The symposium should aim at an evidence-based exhaustive review of the topic. All participating postgraduates should be graded by the faculty and peers. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.

**E. Bedside clinics:** Recommended to be held twice a week.

Clinics/bedside teaching should be coordinated and guided by faculty from the department. Various methods like DOAP (Demonstrate, Observe, Assist, Perform), simulations in skill lab, and case-based discussions etc. are to be used. Faculty from the department should participate in moderating the teaching-learning sessions during clinical rounds.

**F. Interdepartmental colloquium**

- Faculty and students must attend monthly meetings between the main Department and other department/s on topics of current/common interest or clinical cases. Symposium, Colloquium and Seminars may overlap to enhance involvement and active participation of postgraduates.
- **Mortality Meeting:** The mortality meeting should be conducted in the department every month. The post graduate student should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records should be discussed in detail during this meeting.

**G. a. Rotational clinical / community / institutional postings**

Apart for mandatory postings, 'external' postings listed below are highly recommended (desirable) to expose postgraduates to allied Pediatric sub-specialities given existing trends in practice. Specific Learning Outcomes need to be defined for each of these postings even assessed keeping in mind the Competency based curriculum and their future professional roles as Pediatricians.

Rotations are listed below:

### **Mandatory Postings**

- Paediatric Emergency (minimum 1 month a year)
- Neonatology (NICU) (minimum 3 months a year)
- Intensive Care (PICU) (minimum 2 months a year)
- District Residency Programme with participation in Community Outreach Child Health Programs (at least 3 months over the entire course; 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester; See Section G-b below).

### **Desirable postings**

- Subspecialties Outpatient Clinics / observing- assisting in emergency
  - Clinical
    - Child Psychiatry
    - Pediatric Surgery
    - Developmental Pediatrics
    - Pediatric Nephrology
    - Pediatric Neurology
    - Pediatric Hemato-oncology
    - Pediatric Cardiology
    - Pediatric Gastroenterology
    - Pediatric Rheumatology/Immunology/Allergy
    - Genetic
    - Pediatric Pulmonology
    - Pediatric Dermatology
    - Pediatric Endocrinology
    - Adolescent Health
    - DOTS, PPTCT, ART center with pediatric exposure

- Clinical Microbiology
- Radiology including CT/MRI
- Forensic Medicine especially Child related
- Neuro-rehabilitation (PMR, Physiotherapy, Occupational Therapy)

**G. b. Posting under “District Residency Programme” (DRP):**

All postgraduate students pursuing MD/MS in broad specialties in all Medical Colleges/Institutions shall undergo a compulsory rotation of three months in District Hospitals/District Health System as a part of the course curriculum, as per the Postgraduate Medical Education (Amendment) Regulations (PGMER-2023). Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the Postgraduate programme and the rotation shall be termed as “District Residency Programme” and the PG medical student undergoing training shall be termed as “District Resident”.

**a.** The District Resident will work under the overall directions and supervision of the District Residency Programme Coordinator (DRPC). During this rotation, the Resident doctor will be posted with the concerned/allied Speciality team/unit/ sections/services at the District Health System/ District Hospital. The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to their Specialty and encompass night duties.

**b.** Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. Such monitoring systems shall also be accessible to the State/Union Territory Steering Committee and the National Coordination Cell.

**c.** The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.



**d.** Satisfactory completion of the District Residency shall be an essential condition before the candidate is allowed to appear in the final examination of the respective post-graduate course.

**e.** The District Residency Programme Coordinator (DRPC) shall issue certificate of satisfactory completion of DRP and report on the performance of the District Resident on a prescribed format to be decided by the PGMEB to the concerned medical college and the Govt. of the State/UT.

#### **H. Teaching research skills**

Writing a thesis should be used for inculcating research knowledge and skills. All postgraduate students shall conduct a research project of sufficient depth to be presented to the University as a postgraduate thesis under the supervision of an eligible faculty member of the department as guide and one or more co-guides who may be from the same or other departments.

In addition to the thesis project, every postgraduate trainee shall participate in at least one additional research project that may be started or already ongoing in the department. It is preferable that this project will be in an area different from the thesis work. For instance, if a clinical research project is taken up as thesis work, the additional project may deal with community/field/laboratory work. Diversity of knowledge and skills can thereby be reinforced. There should be periodic department review of the thesis work, as per following schedule:

- |                                 |                                |
|---------------------------------|--------------------------------|
| • End of 6 months               | Submission of protocol         |
| • During 2 <sup>nd</sup> year   | Mid-term presentation          |
| • 6 months prior to examination | Final presentation; submission |

#### **I. Training in teaching skills**

MEU/DOME should train PG students in education methodologies and assessment techniques. The PG students shall conduct UG classes and a faculty shall observe and provide feedback on the teaching skills of the student.

#### **J. E-Log book**

During the training period, the postgraduate student should maintain a Log Book digitally

indicating the duration of the postings/work done in Wards, OPDs, Casualty and other areas of posting. This should indicate the procedures assisted and performed and the teaching sessions attended. The logbook entries must be done in real time. The logbook is thus a record of various activities by the student like: (1) Overall participation & performance, (2) attendance, (3) participation in sessions, (4) record of completion of pre- determined activities, and (5) acquisition of selected competencies.

- The purpose of the Log book is to:
  - a) help maintain a record of the work done during training,
  - b) enable Faculty/Consultants to have direct information about the work done and intervene, if necessary,
  - c) provide feedback and assess the progress of learning with experience gained periodically.

The Logbook should be used in the internal assessment of the student, should be checked and assessed periodically by the faculty members imparting the training. The PG students will be required to produce completed logbook in original at the time of final practical examination. It should be signed by the Head of the Department. A proficiency certificate from the Head of Department regarding the clinical competence and skillful performance of procedures by the student will be submitted by the PG student at the time of the examination. The PG students shall be trained to reflect and record their reflections in logbook particularly of the critical incidents. Components of good teaching practices must be assessed in all academic activity conducted by the PG student and at least two sessions dedicated for assessment of teaching skills must be conducted every year of the PG program. The teaching faculty are referred to the NMC-Logbook Guidelines uploaded on the Website.

#### **K. Course in Research Methodology:**

All postgraduate students shall complete an NMC recognized course in Research Methodology (NPTEL) within-1 year of the commencement of the batch and generate the online certificate on successful completion of the course.

#### **Other aspects**

- The Postgraduate trainees must participate in the teaching and training program of undergraduate students and interns attending the department.

- Trainees shall attend accredited scientific meetings (CME, symposia, and conferences) at least once a year.
- Department shall encourage e-learning activities.
- The Postgraduate trainees should undergo training in Basic Cardiac Life Support (BCLS), Neonatal Resuscitation, Advanced Pediatric Life Support (PALS) and Adult Advanced Cardiac Life Support (ACLS) within the first year of the course conducted by the institution.
- The Postgraduate trainees must undergo training in information technology and use of computers.

**During the training program, patient safety is of paramount importance; therefore, relevant clinical skills are to be learnt initially on the models, later to be performed under supervision followed by independent performance. For this purpose, provision of skills laboratories in medical colleges is mandatory.**

## **5. ASSESSMENT**

### **FORMATIVE ASSESSMENT i.e., assessment to improve learning**

**Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self- directed learning and ability to practice in the system.**

#### **General Principles**

The Internal Assessment should be conducted in theory and practical/clinical examination should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Internal Assessment should be conducted in theory and practical/clinical examination. The department should conduct three tests, two of them be annual tests at the end of first and second year. The third test will be preliminary examination which will be held three months before the final examination conducted by the college similar to final University Examination. The tests may include written papers, practical's / clinicals (Direct Observation of Procedural skills)/ OSCE/Case Based discussion/ Mini CEX and viva voce.

Continuous /Periodic assessment during the MD training should be based on:

- 1. Journal based / recent advances learning**
- 2. Patient based /Laboratory or Skill based learning**
- 3. Self-directed learning and teaching**
- 4. Departmental and interdepartmental learning activity**
- 5. External and Outreach Activities / CMEs**

**For Knowledge Assessments,** Patient case scenario presentations and discussions including interdepartmental sessions remain the cornerstone of Paediatric learning focused on critical thinking and clinical reasoning. This is also ideally achieved during teaching at the bedside on rounds and in ambulatory settings such as outpatient clinics if not emergency. Clinical Pathologic Case discussions, Mortality-Morbidity discussions and Prescription-Medication Order Audits are of great value and are encouraged to improve quality of care as well teaching-learning preferably scheduled every month to routine educational program.

**For Psychomotor and Affective/Communication Assessments**, consider the use of OSCEs, DOPs and even mini-CEX that one may strengthen Formative Feedback/Assessments.

**The student to be assessed periodically as per categories listed in appropriate (non-clinical/clinical) postgraduate student appraisal form (Annexure I).**

**SUMMATIVE ASSESSMENT i.e., assessment at the end of training**

**Essential pre-requisites for appearing for examination include:**

**Revised Eligibility requirements for PG Students in Broad Specialty and Super Specialty for appearing in university examination:**

- i. **Log book** of work done during the training period including rotation postings, departmental presentations, and internal assessment reports should be submitted.
- j. Have minimum one Poster presentation or Podium presentation at a National / Zonal / State Conference of his /her specialty.
- k. Have minimum one Research paper published in journal of his/her specialty as first author.
- l. Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
- m. Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
- n. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
- o. Thesis acceptance by all evaluators before the conduct of University Examination.
- p. Attendance of 80% is mandatory.

The summative examination would be carried out as per the Rules given in the latest POSTGRADUATE MEDICAL EDUCATION REGULATIONS (PGMER 2023). The theory examination shall be held in advance before the Clinical and Practical examination, so

that the answer books can be assessed and evaluated before the commencement of the clinical/Practical and Oral examination.

The university shall conduct not more than two examinations in a year, with an interval of not less than 4 months and not more than 8 months between the two examinations.

**The postgraduate examination shall be in three parts:**

**1. Thesis**

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student in broad specialty shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

**2. Theory examination: 400 marks**

There shall be four papers, each of three-hour duration. Total marks of each paper will be 100. Each paper should have 10 short essay questions (SEQ).

Obtaining a minimum of 50% aggregate marks in 'Theory' (minimum 40% in each paper) as well as 'Practical (Clinical + viva voce)' separately shall be mandatory for passing examination. The examination for M.D. shall be held at the end of 3<sup>rd</sup> academic year.

There shall be 4 theory papers (as per PG Regulations).

**Paper I: Basic Sciences as related to the subject**

**Paper II: General Paediatrics**

**Paper III: Systemic Paediatrics**

**Paper IV: Recent Advances**

Type of Questions	No. of Questions	Marks for each question	Total Marks
Short essay	10	10	100 X 4
<b>Grand Total</b>			<b>400</b>

### 3. Practical/clinical and Oral/viva voce examination

#### Practical examination

Practical examination should be as per concerned university regulation.

#### B) CLINICAL EXAMINATION: 300 MARKS

	No of Cases	Marks
Long Case	1	100
Short Case	1	50
Newborn case	1	50
OSCE	6 Stations (1 AETCOM)	6 X 5 = 30
Dissertation (Pedagogy)	1	20
Emergency Wards	5 x 10	50
<b>Total</b>		<b>300</b>

#### Note:

- **The long case will be a patient with either central nervous system (CNS) or a Multi system involvement, which can test the knowledge and skill of the student.**  
**OSCE stations will include 6 stations of 5 marks each** to cover clinical, procedural and communication skills.
- **Emergency wards– spotters**
- **Dissertation** Five per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. Dissertation will be in the form of pedagogy. Candidate is asked to make a presentation for 8 to 10 minutes on the dissertation topic. Both the external examiners outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce.
- Logbook Records and reports of day-to-day observation during the training.

#### C. VIVA- VOCE EXAMINATION: 100 MARKS

**Aims:** To elicit candidate's knowledge and investigative/ therapeutic skills.

All examiners will conduct viva voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition,

candidates may also be given case reports, charts, gross specimens, pathology slides, instruments, X-ray, ultrasound, CT scan images, for interpretation.

It is emphasized that Oral/viva voce examination shall be comprehensive enough to test the postgraduate's overall knowledge of the subject.

**Viva voce four tables of 100 marks each includes the following**

1. Nutrition
2. X- Rays, MRI, CT
3. Drugs and vaccines.
4. Instruments, Case based interpretation of investigations

**D) MAXIMUM MARKS**

Maximum Marks for MD Degree course in Paediatrics	Theory	Practical (Clinical)	Viva Voce	Grand Total
	400	300	100	800

**RECOMMENDED READING:**

**Textbooks:**

**Essential**

Sl. No.	Name of the Book	Author	Publisher
1	Nelson's Textbook of Paediatrics,	Behrman, Kleigman, Jenson	Elsevier
2	IAP Guide book of Immunization	Nitin K. Shah	Jaypee Brothers
3	Manual of Neonatal Care	John P Cloherty, Eric C Eichenwald, Ann R Stark	Lippincot Williams and Wilkins
4	Care of the Newborn	Singh M.	Sagar Publication
5	O.P. Ghai Essential pediatrics	O. P. Ghai, Piyush Gupta, V K Paul	CBS Publisher and Distributors
6	Pediatrics Clinical methods	Singh M.	Sagar Publication
7	Hutchison clinical methods	Michael Swash	Saunders
8	Principles of Pediatric and Neonatal Emergencies	A Parathsarthy, H P S Sachadev	Jaypee publication



9	Illingworth Normal child	Illingworth R. S.	Churchill Livingstone
10	Illingworth Development of the child and infant.	Illingworth R. S.	Churchill Livingstone
11	IAP Text book of Paediatrics	A Parathsarthy,	Jaypee publication

## References

Sl. No.	Name of the Book	Author	Publisher
1	Rudolph's Pediatrics	Colin D Rudolph, Abraham Rudolph	Mc Graw Hill
2	Forfar and Arneil's Textbook of Pediatrics	Neil Mc Intosh, Roselind Smyth, Peter Helms	Churchill Livingstone
3	Oski's Pediatrics: Principles and Practice	Frank A. Oski, Julia A. McMillan, Catherine D. DeAngelis, Joseph B. Warshaw	Wolter Kluwer Company
4	Avery's Disease of the Newborn	Taeush, Ballard, Gleason	Elsevier
5	Roberton's Text book of Neonatology	Janet M. Rennie	Elsevier
6	Nada's Pediatric Cardiology	James E Lock, Donald C Fielar, F Keane	Elsevier
7	Perloff's Approach to congenital Heart Disease	Joseph K Perloff, John S Child,	Harcourt Brace & Company , W B Saunders Co.
8	Harriet Lane pediatric clinical manual	Jason Robertson, Nicole Shilkofski	Elsevier
9	Blood diseases of Infancy and Childhood	Dennis R Miller's, Robert L B, Linda Patrica Miller	Saunders/ Elsevier
10	Clinical Hematology in Medical Practice	D C DeGruchy's, F Firkin	Churchill Livingstone
11	Pediatric Nephrology	Holliday, M.A.; Barrett, Avner, E.D.	Williams and Wilkins

12	Caffey's Pediatric X-ray diagnosis	Jerald P. Kuhn, Thomas L. Slovis, Jack O Haller	Mosby
13	Protein Energy Malnutrition	Alleyne, G A O	Edward Arnold
14	Tuberculosis in Children	Miller F J W	Churchill Livingstone
15	Essentials of Tuberculosis in Children	Vimlesh Seth, S K Kabra	Jaypee Brothers
16	Swenson's Pediatric Surgery	Orvar Swenson	Appleton-Century Crofts (Education Division)
17	Text book of Pediatric Infectious diseases	Ralph D Feigin, James D Cherry, Gail J Dammlor, Sheldon L Kaplan,	Saunders
18	Fenichel's Pediatric Neurology	Fenichel G M	Saunders / Elsevier
19	Kendig's Respiratory Diseases in Pediatrics	Victor Chernic, Thomas Boat, Robert Wilmott, Andrew Bush	Saunders
20	Liver Disorders in Childhood	Alex P Mowat	Butterworth and Co
21	Roger's Pediatric Critical Care	Mark C Roger, Mark A Helfaer	William & Wilkins
22	Smith's Recognisable patterns of Human Malformations	Kenneth Lyons Jones	Saunders / Elsevier
23	Swaiman's textbook of pediatric neurology	Kenneth F Swaiman, Stephen Ashwal	Mosby
24	Practical pediatric nutrition	Elizebeth M E	Poskitt

## RECOMMENDED JOURNALS

### Indexed Journals

1. Indian Pediatrics
2. Indian Journal of Pediatrics
3. Pediatric Clinics of North America
4. New England Journal of Medicine
5. Lancet
6. British Medical Journal

7. Journal of Pediatrics
8. Archives Diseases of Childhood and Adolescence
9. Pediatrics
10. Clinics in Perinatology
11. Seminars in Neonatology
12. Tropical pediatrics
13. Journal of Neonatology – (National Neonatology forum of India)

## Online Resources

- a. IAP <https://www.iapindia.org/><https://diapindia.org/>
- b. GOI MOHFW and IIPS. <http://rchiips.org/nfhs/>
- c. PubMed. <https://pubmed.ncbi.nlm.nih.gov/>
- d. Google Scholar. <https://scholar.google.co.in/>
- e. Cochrane. <https://www.cochranelibrary.com/>
- f. Uptodate. <https://www.uptodate.com/login>
- g. Clinical Key. <https://www.clinicalkey.com/#!/login>
- h. Medscape. <https://www.medscape.com/>
- i. JM Rey's IACAPAP e-Textbook of Child and Adolescent Mental Health.  
Rey JM, Martin A. International Association for Child and Adolescent  
Psychiatry and Allied Professions. ISBN 9780646574400 Free on  
<https://iacapap.org/english/>

## Annexure I

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[illegible]

	Training										
2.6	Participation and contribution to health care quality improvement										
<b>3</b>	<b>Professional attributes</b>										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethically appropriate and respectful at all times										
<b>4</b>	<b>Space for additional comments</b>										
<b>5</b>	<b>Disposition</b>										
	Has this assessment been discussed with the trainee?	Y es	N o								
	If not explain										
	Name and Signature of the assessee										
	Name and Signature of the assessor										
	Date										

**Orientation sessions for PG students joining MD in Paediatrics**

**This could be spread over 4-5 sessions once or twice a week depending on**

## **departmental routine and feasibility.**

### **For all PG students**

Orientation to the Hospital: Various Departments and facilities available

- Communication skills: Patients and colleagues
- Literature search
- Basic research methodology
- Protocol writing and thesis

### **Pediatric PGs**

Introduction to Residency in Paediatrics

- Universal precautions and appropriate disposal of hospital waste
- Management of shock
- Congestive cardiac failure
- Normal fluid and electrolyte requirement and their disorders
- Interpretation and management of disorders of acid-base balance
- Evaluation of a sick newborn
- Management of seizures, hypothermia and hypoglycemia in the newborn
- Management of seizures and status epilepticus
- Management of comatose patients
- Hospital management of severe PEM
- Acute kidney injury
- Fulminant hepatic failure
- Management of respiratory distress
- Management of acute diarrhea
- Approach to a bleeding child and its management
- Rational antibiotic therapy

## **POSTGRADUATE DEGREE**

### **M.D. IN PSYCHIATRY**

#### **I. GOALS**

The purpose this curriculum is to create specialists who would provide high quality health care and advance the cause of science through research & training. A postgraduate specialist having undergone the required training should be able to recognize the health needs of the community, should be competent to handle medical problems effectively and should be aware of the recent advances pertaining to his specialty. The post graduate student should acquire the basic skills in teaching of medical/para-medical students. She/he is also expected to know the principles of research methodology and modes of consulting library.

#### **II. SUBJECT SPECIFIC LEARNING OBJECTIVES**

The course of the postgraduate students in Psychiatry is to impart Knowledge and skills that may enable them to diagnose and treat common and rare diseases, complications of Psychiatric diseases and their unusual manifestations. The student should also be aware of the recent advances in the specialty.

At the end of postgraduate training the student should be able to:

- Practice efficiently and effectively, backed by scientific Knowledge and skill.
- Understand the relevance of mental health in relation to the health needs of the country
- Exercise empathy and a caring attitude maintaining high ethical standards.
- Identify the social, economic, biological and emotional determinants of mental health
- Institute appropriate diagnostic, therapeutic and rehabilitative procedures to the mentally ill patient
- Take detailed history, conduct appropriate ethically valid physical examination and institute appropriate evaluation procedures to make a correct clinical diagnosis
- Perform relevant investigative and therapeutic procedures for the psychiatric patient
- Recommend appropriate laboratory and imaging examinations and interpret the results correctly
- Plan and deliver comprehensive treatment of a psychiatric patient using principles of rational drug therapy



- Plan rehabilitation of psychiatric patient suffering from chronic illness
- Clinically manage psychiatric emergencies efficiently
- Develop appropriate skills to practice evidence-based psychiatry
- Demonstrate competence in basic concepts of research methodology and epidemiology
- Be aware of and take appropriate steps in the implementation of national mental health programs, effectively and responsibly
- Be aware of the concept of essential drugs and rational use of drugs
- Be aware of the legal issues in the practice of Psychiatry
- Be aware of the special requirements in the practice of Child and adolescent Psychiatry and Geriatric Psychiatry
- Demonstrate empathy and humane approach towards patients and their families and respect their sensibilities
- Demonstrate communication skills of a high order in explaining management and prognosis, providing counseling and giving health education messages to patients, families and communities
- Research: He should know the basic concepts of research methodology and plan a research project in accordance with ethical principles. S/he should also be able to interpret research findings and apply these in clinical practice. S/he should know how to access and utilize information resources and should have basic knowledge of statistics. The student should take up the common course work in Research methodology, ethics and good clinical practice
- Student should be able to provide of basic life support, whenever necessary.
- Ethical considerations in the teaching and practice of Psychiatry
- Be aware of the role of sex and gender in the practice of psychiatry
- Be able to determine the capacity and capability of the individual (especially children and adolescents) to identify and articulate a gender identity

Teaching skills: The student should know the principles of large group and small group teaching in Psychiatry. Should be able to use innovative teaching learning methods to enhance learning experience.

S/He should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students, health professionals, members of allied disciplines (e.g. behavioural sciences), law enforcement agencies, families and consumers and members of the public.

## **II. COMPETENCIES**

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The objectives may be considered under the following subheadings.

1. Cognitive
2. Psychomotor
3. Affective

### **1. Cognitive:**

1. The student should be able to demonstrate knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to Psychiatry.
1. The student should be able to explain etiology, assessment, classification and management and prognosis of various psychiatric disorders (including psychiatric sub-specialties), and Neuroanatomy, Neurophysiology, Neurochemistry,
2. Neuroimaging, Electrophysiology, Psycho-neuroendocrinology, Psychoneuroimmunology, Chronobiology and Neurogenetics.
4. Acquire knowledge of delirium, dementia, amnestic & other cognitive disorders and mental disorders due to a general medical condition.
5. The student should acquire knowledge of emergency measures in acute crisis arising out of various psychiatric illnesses including drug detoxification and withdrawal.
6. The student should acquire knowledge of pharmacokinetics & pharmacodynamics of drugs involved in psychiatric management of patients.
7. The student should acquire knowledge of (a) normal child development and adolescence, mental retardation in children (b) learning & associated disorder and their management (c) abuse and neglect in childhood
8. The student should acquire theoretical aspects of psychiatric rehabilitation

9. The student should acquire knowledge of substance related disorders and their management.
10. The student should acquire knowledge of psychotic disorders, mood disorders, and anxiety disorders and their management
11. The student should acquire knowledge of sexual and gender identity disorders and their management.
12. The student should acquire knowledge of eating disorders and sleep disorders and their management.
13. The student should understand difference between sex and gender/ biological and social construction of personhood; sexual/gender identity; transgender, gender non-conformity, and other gender diverse identities, sexual/sexuality identity, sexual orientation, sexual desire; the wide variety, and cultural presence of various sexual orientations and desires; gender dysphoria and its management.
14. The student should be conversant with recent advances in Psychiatry.
15. The student should be conversant with routine bedside diagnostic and therapeutic procedures and acquire knowledge of latest diagnostics and therapeutics procedures available.
16. The student should be conversant with various policy related aspects of Psychiatric practice in India (e.g. Mental Health Act, National Health Mental Health Programs etc.).
17. The student should be able conversant with various concepts of forensic psychiatry and laws pertaining to mental health including POCSO act.
18. The student should be conversant with research methodologies.
19. Student should be conversant with the role of Yoga and Meditation in the management of psychiatric disorders.

## **2. Psychomotor:**

**The student, at the end of the course should be able to perform independently, the following:**

1. In good history taking, physical examination, mental state examination, and able to establish rapport and counsel family members and patients on scientific basis.
2. Choosing the required investigations.
3. Write a complete case record with all necessary details.

4. Write a proper discharge summary with all relevant information
5. Obtain informed consent for any examination/procedure.
6. Perform clinical audit.
7. Basic Life support measures
8. Management of emergencies.
9. Must be able to perform modified Electroconvulsive therapy (ECT).
10. Using appropriate admission procedures as per the Mental Health Care Act.
11. Able to do risk assessment and mental capacity assessment.
12. Provide a clinical formulation, arrive at a logical working diagnosis and differential diagnosis after clinical examination.
13. Should have the following skills in relation to gender related issues:
  - Demonstrate the ability to assess the gender identity of an individual and distress caused (if any) due to the individual's own gender identity in simulated environment.
  - Describe and understand how to discuss sexual orientation, sexuality identity, gender identity, as well as intersex identity (differences in sex development) as part of routine history taking.
  - Demonstrate the ability to educate and counsel individuals or family members about intersex variations, sexual orientations, sexuality identities, gender incongruence, gender dysphoria, and gender identities. Demonstrate ability to identify when a mental health referral is needed for the above.
  - Demonstrate knowledge that conversion therapy practices for sexual orientation or gender identity or on people with intersex variations is unethical.
  - Describe differences between Gender Incongruence and Gender Dysphoria.
  - Describe and understand gender identity, the biological and gender binaries, rejection of gender binary, gender non-conforming, gender non-binary, androgynous, and other identities.
  - Demonstrate the ability to educate an individual and family members that Gender Incongruence by itself is not a disorder and does not require clinical intervention. Any form of conversion therapy is unethical.
  - Discuss situations where there is a role for mental health support in Gender Dysphoria i.e., discussing with family, deciding on hormonal treatments or Sex

Reassignment Surgery (Gender Affirming Care or Gender Affirmative Therapies or Gender Confirmation Surgery).

**The student, at the end of the course should be able to perform independently, the following:**

1. Conduct detailed Mental Status Examination (MSE)
2. Cognitive behaviour therapy
3. Supportive psychotherapy
4. Modified ECT and non-invasive neuromodulation
5. Clinical IQ assessment
6. Management of alcohol withdrawal
7. Alcohol intoxication management
8. Opioid withdrawal management
9. Delirious patients
10. Crisis intervention

**The student must be able to demonstrate approach to patient with variety of clinical presentations including following symptoms:**

1. Psychotic symptoms
2. Seizures true and pseudo seizure
3. Anxiety symptoms
4. Affective symptoms
5. Cognitive symptoms
6. Catatonia
7. Delirium
8. Malingering
9. Behavioral symptoms of developmental disorders

**The student, at the end of the course should be able to perform under supervision, the following:**

1. Behavior therapy

2. Opioid intoxication management
3. Genetic counselling
4. Family therapy
5. Cognitive behavior therapy and other newer therapies
6. First level psychological intervention for sexual abuse, sexual assault and domestic violence

**The student, at the end of the course should be able to assist the expert in the following:**

1. Interpersonal therapy
2. Management of suicide attempt

**3. Affective:**

- Adopt ethical principals in all aspects of his/ her practice; professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular to explain various options available in the management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his / her team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations of his / her knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to seek information and right to seek a second opinion.

## Syllabus

### **Course Contents (Components of curriculum):**

No limit can be fixed and no fixed number of topics can be prescribed as course content. A student is expected to know the subject in depth. However, emphasis should be on the disease / health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his / her specialty should get high priority.

Competence in psychiatric, medical and psychotherapeutic skills (actual hands on training) must be ensured.

**A. Theoretical Concepts:**

1. Adjustment Disorders
2. Anxiety Disorders
3. *Child and adolescent psychiatric disorders.*
4. *Chronobiology, Psych neuroendocrinology & Psychoneuroimmunology.*
5. Classification in Psychiatry
6. *Community Psychiatry*
7. Consultation-Liaison Psychiatry
8. Culture Bound Syndromes/ Transcultural Psychiatry
9. *Dissociative (Conversion)*
10. Eating Disorders
11. Electro-Convulsive Therapy
12. Electrophysiology
13. Emergencies in Psychiatry
14. *Epidemiology: of Psychiatric disorders*
15. Ethics In Psychiatry
16. Factitious Disorders
17. *Forensic / Legal Psychiatry*
18. History of Psychiatry
19. *Impulse-Control Disorders*

20. *Memory*

21. Mental Health Issues in Women

22. Mental Retardation

23. *Mood Disorders*

24. Neuroanatomy, Neurophysiology and Neurochemistry – related to Psychiatry

25. *Neuro-imaging related to psychiatry*

26. *Neuropsychology*

27. *Psychology (General & Clinical): With Special Emphasis on Personality, Emotions, Learning, Motivation, memory, etc.*

28. Psychology (Social)

29. Psychometry / Psychodiagnostics

30. *Organic Psychiatry (Delirium, Dementia etc.)*

31. Personality Disorders

32. Psychodynamics

33. Psychiatric assessment (including History Taking, Neurological Examination, Mental Status Examination, Investigations, Use of rating scales, etc.).

34. Psychopharmacology

35. Psychoses (Including Schizophrenia, Schizophreniform Disorder, Schizoaffective Disorder, Delusional Disorder, Brief Psychotic Disorder, Shared Psychotic Disorder, etc.)

36. Psychosomatic Disorders.

37. *Psychotherapy: Introduction to different types of Psychotherapies*

38. *Occupational Therapy and Rehabilitation: Basic Concept.*



39. Movement Disorders (including Medication-Induced Movement Disorders, etc)
40. Newer therapies like rTMS, Vagal Nerve Stimulation, Deep Brain Stimulation  
*Psycho surgery*
41. Normal sexuality, Sexual and Gender Identity Disorders
42. Sleep, its and Sleep Disorders
43. Somatoform Disorders
44. *Statistics /Research Methodology: Basic Concepts.*
45. Stress and stress management
46. Substance Related Disorders
47. Suicide and its prevention
48. Pre-Menstrual Dysphoric Disorder
49. Perinatal Psychiatry
50. Geriatric Psychiatry (including dementia, legal and ethical issues, positive psychiatry in aging, psychiatric aspects of long term care)
51. *Miscellaneous:* Non-compliance, Malingering, Antisocial Behaviour, Borderline Intellectual Functioning, Age-Related Cognitive Decline, Bereavement [including Death], Academic Problems, Occupational Problems, Identity Problems, Religious or Spiritual Problems, Acculturation Problems, Phase of Life Problems, Chronic Fatigue Syndrome, etc.)

**The student may know the following:**

1. History of Psychiatry
2. Epidemiology

3. Mind – the evolving concepts
4. Psychiatry rating scales
5. Placebo Effect
6. Sex and Gender Issues in Psychiatry

### **B. Practical / Clinical concepts:**

Post graduate students should do ward rounds every day. Newly admitted patients should be worked up by them and should be presented to the staff during rounds. Students are also expected to work up the case in outpatient department, take a proper clinical history, examine the patient, perform essential diagnostic /therapeutic procedures and interpret them to arrive at a reasonable diagnosis.

Each student will be given clinical responsibility as full time assignment to various areas in rotation. He / she will be given full responsibility of patient care and the record keeping under the supervision of staff members.

The student will initially observe and later perform procedures like electro convulsive therapy (ECT), psychotherapies, narco-analysis / suggestion, bio-feedback, etc independently.

### **C. Diagnostic procedures:**

The student will initially observe and later perform the following diagnostic tests independently. The student will discuss the test results to the staff member and seek further guidance from them.

- a. IQ assessment
- b. Projective tests like Rorschach's ink blot test, Thematic apperception test, Sentence completion test, Draw a person test, etc.
- c. Personality assessment tests
- d. Rating scales
- e. Lobe function tests
- f. Electro encephalogram
- g. Narco analysis

Various academic activities will be supervised, rated periodically by the consultants. Resident will be encouraged to keep a logbook and meticulously make entries.

### **Teaching and Learning Activities:**

Didactic lectures are of least importance. Seminars, journal clubs, symposia, reviews and guest lectures should get priority for developing theoretical knowledge. Bedside teaching, grand rounds, interactive group discussions, clinical demonstrations and clinical case presentations should be the hallmark of clinical / practical learning. Student should have hands-on training in performing various procedures like ECT and also in various counseling, psychotherapeutic skills including behavior techniques. He / she should have the ability to interpret various tests / investigations. Student should have exposure to newer specialized diagnostic / therapeutic procedures concerning his / her subject.

The post graduate student should have knowledge of:

- Psycho-pharmacology and broadening the treatment options using medicines.
- Neuro-imaging techniques to understand behavior and psychiatric illness.
- Community-Psychiatry.
- Functioning of psychiatric hospital.

Community Psychiatry should go beyond familiarization with the National Mental Health Programme. The post graduate student should have hands on experience with:

- Training programmes for primary care physicians
- Organizing Mental Health Camps
  - Carrying out Health Education Activities
- Forensic /Legal Psychiatry
- Integration of Mental Health Care with General Health Care

#### **1. Theoretical teaching:**

- a) **Lectures:** Lectures are to be kept a minimum. Certain selected topics will be taken as lectures.
- b) **Journal Club:** It should be a monthly meeting in which a resident presents a critical evaluation of a research paper from an appropriate journal. Residents are expected to attend & discuss.

- c) Seminars:** There should be a weekly seminar in which the Junior Residents present material on assigned topics in rotation. It should be followed by discussion in which all trainees are expected to participate. Generally, the topics covered should be those that supplement the formal teaching program.
- d) Case presentations:** All new in-patients and outpatients' cases should be routinely reviewed with one of the Consultants. In addition, the PG student is required to present case material at routine rounds and other case conferences. Senior PG students will conduct evening classes on clinical topics.
- e) Case Conferences:** A case conference should be held every week where a Junior Resident prepares and presents a case of academic interest by rotation and it is attended by all the members of the department.
- f) Ward Rounds:**
- i. **Service rounds-** Students should do service rounds every day for the care of patients. Any problems in the management of patients should be informed to the consultant and guidance should be sought.
  - ii. **Teaching rounds-** Newly admitted patients should be worked up in detail by the student and should be presented to the consultant and the team having psychologists and psychiatric social workers. The team will guide the student to arrive at a suitable diagnosis and discuss various therapeutic options. Student's knowledge and skills are assessed by the team and student is guided where ever necessary.
- g) Teaching skills:** Post graduate student must teach MBBS students, Physiotherapy students and Nursing students by taking bed side clinics, tutorials, lectures, etc.
- h) Psychotherapy Tutorials:** These should be held in small groups supervised by a consultant during which a case is presented by a resident and psychotherapeutic management is discussed.
- i) Speciality Clinics:** *Neuro Psychiatry clinic for elderly Child guidance clinic Clinic for Senile disorder Psycho Motor clinic Deaddiction Memory clinic Family Counselling*
- j) Continuing Medical Education Programmes(CME):** It is recommended that at least 2 state level CME should be attended by each student in 3 years.
- k) Conference: Post** –A post graduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster

presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

- l) Research Forum:** There will be periodic meetings of one hour each in which the residents present their plan of research as well as the report of the completed work of their project. The other research scholars/workers in the department also participate in it. The faculty, residents and the non-medical professionals make critical comments and suggestions.

**m) Extra-mural Activities:** Residents are encouraged to attend certain academic / semi-academic activities in the allied subjects. e.g. seminars / lectures held at departments of sociology, psychology and neurology etc.

## 2. Practical Training:

Rotation:

Clinical Postings

- A major tenure of posting should be in General Psychiatry. It should include care of in-patients, out-patients, special clinics and maintenance of case records for both in and out patients.
- Exposure to the following areas should be given: -

Schedule of clinical posting for MD Psychiatry (36 months):

Each student/resident shall be given clinical responsibility as full time assignment to various areas in rotation. The general schedule of clinical posting shall be according to a standardized scheme:

<b>Ward</b> (Including Child & Adolescent Psychiatry, Consultation - Liaison Psychiatry and Drug de-addiction training)	<b>13 Months</b>
<b>OPD and Wards</b> (Including, Consultation - Liaison Psychiatry and Drug de-addiction training)	<b>12 Months</b>
<b>Neurology</b>	<b>02 Months</b>
<b>Child Psychiatry including CDC</b>	<b>03 Month</b>
<b>Internal (Gen) Medicine</b>	<b>01 Month</b>
<b>Clinical Psychology</b>	<b>01 Month</b>
<b>Community Psychiatry (District Residency Program)</b>	<b>03 Month</b>
<b>Mental Hospital / (NIMHANS) Posting</b>	<b>30 Days</b>

Child Psychiatry	10 Days
De-addiction Clinic	10 Days
Behaviour Therapy	10 Days
<b>Total</b>	<b>36 Months - 00 Days</b>

The Student/Resident will be given full responsibility of the patient care and the record keeping under the supervision of the senior residents and consultants. The resident will also take patients for individual as well as group psychotherapy under supervision.

**Applicable only for trainees in General Hospital Psychiatric units:** Facilities for these need to be arranged.

The post graduate student in Psychiatric hospitals would have extended period of exposure to consultation - liaison psychiatry and other medical specialties. Exposure to community-based services should be integral part of various postings. The post graduate student shall be given full responsibility for patient care and record keeping under the supervision of the senior PG students and consultants. The post graduate student shall also take patients for psychological interventions in an individual as well as group setting. S/he must complete a minimum of 100 hours of supervised psychological interventions.

- **Inter-Unit Rotation of posting**

Inter-unit rotation in the department should be done for a period of up to one year (divided during the first year and third year while the post graduate student stays in the parent unit throughout the duration of his thesis work).

### **3. Clinical meetings:**

There should be intra - and inter - departmental meetings for discussing the uncommon / interesting medical problems.

During the training programme, patient safety is of paramount importance, therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently. For this purpose, provision of clinical skills laboratories in medical colleges is mandatory. Objective structured clinical examination (OSCE) modules may be developed and used in teaching.

## **Other criteria to be fulfilled for the degree course:**

### **1. Maintenance of log book:**

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. special mention may be made of the presentations by the candidate by well as details of clinical or laboratory procedures if any conducted by the candidate. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the head of the Department and Head of the institution and presented in the University practical/clinical examination

### **2. Dissertation:**

Every candidate pursuing MD degree course is required to carry outwork on a selected research project under the guidance of a recognized post graduate teacher. The research of such a work shall be submitted in the form of a dissertation.

For details regarding DISSERTATION Refer 9.1 to 9.11 of chapter-I

## **Scheme of Examination**

### **A. Formative assessments:**

During the course of three years, the department will conduct two formative assessment exams including Preliminary exam. Two of them will be annual, one at the end of first year and other at the end of second year. Format will be the written papers, practical / clinical and viva – voce. Candidate should pass annual formative assessment to enter into subsequent academic year. Records and marks obtained in such tests be maintained by the head of the department will be sent to the university when called for. Results of all evaluations should be entered in to PG's log book and departmental file for documentation purposes. Main purpose of formative assessment is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

### **Quarterly assessment during the MD training should be based on:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Professionalism and teamwork

### **B. Summative Assessment:**

Candidates will be allowed to appear for examination only if attendance (minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

### **A. Theory: 400 Marks**

There shall be four question papers, each of three hours duration. Total marks for each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

Type of Questions	Number of questions	Marks for Each question	Total Marks
Essay questions	10	10	100

#### **Paper I: Basic Sciences as related to Psychiatry**

Neuroanatomy, Neurophysiology, Neurochemistry, Genetics, General and Abnormal Psychology, Social psychology, Anthropology, Ethology and Statistics

#### **Paper II: Clinical Psychiatry**

History of psychiatry, Classificatory Systems in Psychiatry, Adult Psychiatric Disorders like Mood disorders, Schizophrenia, Anxiety Disorders, Personality Disorders, Substance Related Disorders, Sexual Disorders, Eating Disorders, Sleep Disorders. Psychosomatic Disorders, Consultation-Liaison Psychiatry, Geriatric Psychiatry, Psychiatric Emergencies, Psycho-oncology, Psychoneuroimmunology, Psychoneuroendocrinology, Chronobiology, Electro-Physiological Procedures and Brain Imaging in Psychiatry.

#### **Paper III: Psychiatric Theory and Psychiatric Specialties.**

Child & Adolescent Psychiatric Disorders including Mental Retardation. Mental Health issues in women including Post-Partum Psychiatric Disorders, Measurements in Psychiatry, Psychopharmacology, Electro Convulsive Therapy, Psychosurgery, Psychotherapy, Rehabilitation in Psychiatry, Forensic Psychiatry, Cultural Psychiatry, Community Psychiatry and Ethics in Psychiatry, Crisis intervention and Suicide.

#### **Paper IV: Recent Advances in Psychiatry and Applied Psychiatry related to Neurology and Medicine.**

Neurology and Medicine related to Psychiatry, Organic Psychiatric Disorders and Substance Abuse Disorders. Recent advances in various fields of Psychiatry and related to Psychiatry.

Note: The distribution of chapters / topics shown against the papers are suggestive only and may overlap or change.

### **B. Practical / Clinical Examination: 300 Marks**



**Aim:** To elicit competence in clinical skills and to discuss differential diagnostic / therapeutic aspects.

There will be one Psychiatry long case of 100 marks. There will be two short cases of 50 marks each (one Psychiatry short case and one Neurology / Neuropsychiatry short case). The format of clinical examination will be same as shown below.

<b>PRACTICALS</b>	<b>Number of Cases</b>	<b>Marks</b>
Dissertation		20
OSPE		25 (5 stations x 5 marks)
Long Case	1 (Psychiatry)	100
Short Case	2 (40 marks each) (one Psychiatry and one Neurology / Neuropsychiatry)	80
Subject specific assessment		75
Total	4	300

### **C. Viva-Voce examination: 100 Marks**

**Aim:** To elicit candidate's knowledge and investigative / therapeutic skills.

#### **1. Viva – voce examination: (80 marks)**

All examiners will conduct viva voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course content. In addition, candidates may be given Case Reports, Gross Specimens, X-Rays, CT and MR Scan Images, EEG recordings, Lab Reports, Psychological assessment instruments and reports, other instruments used in Psychiatry. Candidates may be asked questions regarding this. Candidate's knowledge of drugs pertaining to Psychiatry will also be evaluated during viva – voce examination. Viva – voce examination can include discussion on Dissertation also.

#### **2. Pedagogy Exercise and Log-Book: (20 Marks)**

- Candidate is asked to make presentation for 8 – 10 minutes on a topic given before the clinical examination or may be asked to make a presentation for 8 – 10 minutes on the Dissertation topic.
- The review of log book

### **D. Maximum Marks**

Maximum marks for MD Psychiatry	Theory	Practical (Clinical)	Viva-Voce	Grand Total
	400	300	100	800

All examiners will conduct viva-voce conjointly on candidate's comprehension,

analytical approach, expression and interpretation of data. It includes all components of course contents. In addition, candidates may also be given Case reports, Charts, Gross specimens, X-rays, CT/MRI scan images, EEG, etc, for interpretation. Questions on use of Drugs, Instruments & Psychodiagnostics will be asked. It can include discussion on dissertation also.

**E. Passing Criterion:**

To pass the examination, the candidate must secure 50% of the marks in each head of theory and practical separately

<b>Sl. No</b>	<b>Name of the Text Book</b>	<b>Authors</b>	<b>Publisher</b>
1	Kaplan & Sadock's Comprehensive Text Book of Psychiatry, Ed 10 , 2017	Sadock BJ and Ruiz P	Lippincott William and Wilkins
2	Synopsis of Psychiatry Ed 11, 2018	Kaplan (H) and Sadock (B)	Waverly Pvt Ltd
3	Organic Psychiatry: Consequence of Cerebral Disorder Ed 4,2009	Leishman (WA)	Blackwell, Sciences
4	The Pharmacological Basis of Therapeutics Ed 12, 2011	Bruton LL, Lazo JS Parker KL, Goodman and Gilman	Mc Graw Hill
5	Introduction to Psychology Ed 7, 2006	Munn (Fernald & Fernald	AITBS
6	Correlative Neuroanatomy and Functional Neurology Ed 1, 2005	Vyas, Gad, Nathawat	Paras Publications
7	Sims' Symptoms in the Mind. An Introduction to Descriptive Psychopathology Ed 4, 2008	F. Oyebode	W.B. Saunders
8	Child and Adolescent Psychiatry Ed 5, 2009	Michael Rutter and Eric Taylor	Blakwell
9	Clinical Psychiatry Ed 5, 1992	Mayer-Gross Slater and Roth	Bailliere Tindall London
10	Text Book of Post Graduate Psychiatry Ed 2, 2003	Niraj Ajuja	Jaypee Brothers
11	Shorter Oxford Text Book of Psychiatry Ed 5 , 2006	Gelder M, Mayou R, Cowen	Oxford University Press
12	Text Book of Psychiatry Ed 7, 2011	Niaraj Ahuja	Jaypee Brothers
13	Fish's Clinical Psychopathology: Signs and Symptoms in Psychiatry Ed 3, 2007	FJ Fish, Casey P, Kelly B	RCPsych Publications
14	ICD 10Classification of Mental and Behavioural Disorders, Clinical Description and Diagnostic Guidelines, 2007	World Health Organization Geneva	Oxford University Press
15	Mental Health Care Act. (2017)		
16	American Psychiatric Association Practice Guidelines for the Treatment of Psychiatric Disorders Compendium Ed 1, 2006	American Psychiatric Association	American Psychiatric Association Washington DC
17	Diagnostic and Statistical Manual of Mental Disorders -5 (DSM –5), 2013	American Psychiatric Association	American Psychiatric Association Washington DC
18	Stahl's Essential Psychopharmacology: Neuroscientific Basis and Practical Applications. Ed 4, 2014	Stephen M. Stahl	<a href="#">Cambridge University Press</a>
19	Abnormal Psychology and Modern Life. Ed 10. 1998	Robert C. Carson, Don C. Fowles	Pearson Education
20	Walsh's Neuropsychology: A Clinical Approach. Ed 5. 2005	David Darby, Kevin William Walsh	Elsevier Churchill Livingstone
21	Text book of Neuroanatomy	I.B. Singh	

## VII. RECOMMENDED TEXT BOOKS (LATEST EDITIONS)

## VIII. RECOMMENDED JOURNALS:

Sl. No.	Name of the journal
1	Indian Journal of Psychiatry
2	American Journal of Psychiatry
3	Archives of General Psychiatry ( <i>JAMA Psychiatry</i> )
4	British Journal of Psychiatry
5	Psychiatric Clinics of North America
6	Indian Journal of Clinical Psychology
7	Acta Psychiatrica Scandinavica
8	Indian Journal of Psychological Medicine
9	Journal of Clinical Psychiatry



# **COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MD IN RADIODIAGNOSIS**

## **I.PREAMBLE:**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

## **II. GOAL:**

The goal of this program is to impart training in conventional and modern radiology and imaging techniques so that the post graduate student becomes well versed and competent to practice, teach and conduct research in the discipline of radiology. The student should also acquire basic knowledge in the various sub-specialties of radiology.

## **III. SPECIFIC LEARNING OBJECTIVES:**

The objective of the program is to train a student to become a skilled and competent radiologist to conduct and interpret various diagnostic/interventional imaging studies (both conventional and advanced imaging), to organize and conduct research and teaching activities and be well versed with medical ethics and legal aspects of imaging/intervention.

## **IV. SUBJECT SPECIFIC COMPETENCIES:**

### **A. Cognitive Domain**

A post graduate student on completing MD (Radio-diagnosis) should acquire knowledge in the following areas, and be able to:

1. Acquire good basic knowledge in the various sub-specialties of radiology such as chest radiology, neuro-radiology, GI-radiology, uro-radiology, cardio-vascular radiology, musculoskeletal, interventional radiology, emergency radiology, pediatric radiology and women's imaging.
2. Independently conduct and interpret all routine and special radiologic and imaging investigations.
3. Provide radiological services in acute emergency and trauma including its medicolegal aspects.
4. Elicit indications, diagnostic features and limitation of applications of ultrasonography, CT and MRI and should be able to describe proper cost-effective algorithm of various imaging techniques in a given problem setting.
5. Decide on the various image-guided interventional procedures to be done for diagnosis and therapeutic management.
6. Able to decide on further specialization to be undertaken in any of the branches in Radio-diagnosis such as gastrointestinal radiology, uro-radiology, neuro-radiology, vascular radiology, musculoskeletal radiology, interventional radiology etc.
7. Able to formulate basic research protocols and carry out research in the field of radiology- related clinical problems.
8. Acquire knowledge and teaching capabilities to work as a post graduate student/consultant in Radio-diagnosis and conduct teaching programs for undergraduates, post graduates as well as paramedical and technical personnel.
9. Interact with other specialists and super-specialists so that maximum benefit accrues to the patient.
10. Should be able to organize CME activities in the specialty utilizing modern methods of teaching and evaluation.
11. Acquire knowledge to impart training in both conventional radiology and modern imaging techniques so that the post graduate student is fully competent to practice, teach and do research in the broad discipline of radiology including ultrasound, Computed Tomography and Magnetic Resonance Imaging.
12. Acquire knowledge of interventional radiology.

## **B. Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
4. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
5. Breaking bad news: In every area of clinical practice, it is always difficult and awkward to break bad news to a patient, whether at the time of diagnosis, recurrence, disease progression. Bad news is defined as “any news that adversely and seriously affects an individual’s view of his or her future.” SPIKES protocol for breaking the bad news can be followed.

S = SETUP. Set up the situation so it has a good chance of going smoothly. Turn your mobile phone off or give it to someone else so you are not interrupted. Sit down, make eye contact, and get reasonably close to the patient. Anticipate that the patient will be upset and have some tissues ready.

P = PERCEPTION. Find out the patient’s perception of the medical situation. What has he been told about the disease? What are his expectations of treatment? Correct any misconceptions or misunderstandings the patient may have.

I = INVITATION. Find out how much information the patient wants. These days most patients want a lot of information but this is not universally true, especially as the disease progresses and patients may want to focus on “What do we do next?”

K = KNOWLEDGE. Use language that matches the patient’s level of education. Be direct. Give a warning that bad news is coming: “I have some serious news to tell you.” This will allow the patient to prepare psychologically. After giving the news, stay quiet for at least 10-15 seconds-resist the urge to tell the patient how to feel. Give the patient time to absorb the information and respond.

E = EMPATHIZE. Use empathic statements to respond to patient emotions. This will assist in patient recovery and dampen the psychological isolation which the patient experiences when they hear the bad news. If a patient begins to cry, wait until he is ready to talk; Ask if the patient has questions or concerns and keep asking until he says “no.”

S = SUMMARIZE AND STRATEGIZE. Summarize the clinical information and make a plan for



the next step, which may be further testing or discussion of treatment options. Be as concrete as possible and check on the patient's understanding of what has been discussed.

## **c. Psychomotor domain**

Practical Training will include two major aspects:

- a) Interpretation of images
- b) Skill in performing a procedure

### **a) Interpretation of images:**

The student should be able to interpret images on all imaging modalities of diseases of following organs:

- 1. Musculo-skeletal System** - Interpretation of diseases of muscles, soft tissue, bones and joints including congenital, inflammatory, traumatic, endocrine and metabolic, neoplastic and miscellaneous conditions.
- 2. Respiratory System** - Interpretation of diseases of the chest wall, diaphragm, pleura and airway; pulmonary infections, pulmonary vasculature; pulmonary neoplasm; diffuse lung disease; mediastinal disease, chest trauma; post-operative lung and X-ray in intensive care.
- 3. Cardiovascular System** - Interpretation of diseases and disorders of cardiovascular system (congenital and acquired conditions) and the role of imaging by conventional radiology, ultrasound, color Doppler, CT, MRI, Angiography and Isotopes Studies.
- 4. Gastro-intestinal tract and hepato-biliary pancreatic system** - Interpretation of diseases and disorders of mouth, pharynx, salivary glands, esophagus, stomach, small intestine, large intestine, diseases of omentum, peritoneum and mesentery, acute abdomen, abdominal trauma, diseases and disorders of liver, biliary system and pancreas.
- 5. Urogenital System** - Interpretation of various diseases and disorders of genitourinary system. These include: congenital, inflammatory, traumatic, neoplastic, calculus disease and miscellaneous conditions.
- 6. Central Nervous System (C.N.S.)** - Interpretation of diseases and disorders of the head, neck and spine covering, congenital, infective, vascular, traumatic neoplastic degeneration metabolic and miscellaneous condition.
- 7. Imaging in Emergency Medicine.**
- 8. Imaging in Obstetrics and Gynecology.**
- 9. Imaging of Breast and interventional procedures.**
- 10. Imaging of Head & Neck.**
- 11. Imaging of endocrine glands and those involved with metabolic diseases.**

## **12. Clinical applied radionuclide imaging.**

### 13. Interventional Radiology.

#### b) Skills in performing a procedure

The student should be able to perform the following procedures:

1. **Gastrointestinal tract contrast studies:** Barium studies (swallow, upper GI, Follow through, enema); Fistulogram; sialogram; cologram/ileostogram.
2. **Urogenital system:** Excretory urography, MCU, RGU, nephrostogram, genitogram.
3. **Ultrasound:** Studies of whole body including neonatal transfontanell studies, Doppler studies,
4. **CT scan:** should be able to position a patient, plan study as per the clinical indication, do reconstruction of images, perform triple phase study, perform & interpret advanced applications like CT enterography, CT angiography etc.
5. **MRI:** plan and perform MRI studies of whole body
6. **DSA:** should be able to describe the techniques, do (if available to student) transfemoral puncture and insert catheter, help in angiographic procedures both diagnostic and interventional.
7. **Radiography:** should be able to independently do radiography of common and some important uncommon views of different body parts. This includes positioning, centering of X ray beam, setting of exposure parameters, exposing and developing the films. The student should be familiar with not only conventional radiography but with CR and DR systems.
8. **Interventional radiology:** The student should be able to perform simple, common non-vascular procedures under ultrasound and fluoroscopy guidance e.g. abscess drainage, drainage catheter placement, nephrostomy, biliary drainage etc. The student should have knowledge of common vascular interventions e.g. stricture dilatation using balloon catheters, embolization with gel foam and other agents, names of common catheters, handling of intravenous contrast reactions; techniques, indications and contraindications for various procedures.

**9. Optimum patient safety:** The radiology post graduate student should be able to relate the safety measures predominantly to the modality work areas: sonography, CT, MRI, general radiology and fluoroscopy, interventional radiology, breast imaging, and pediatrics imaging.

### **Measures to be taken by the post graduate student to ensure optimum patient safety:**

- a. Optimize radiation exposure
- b. Accountability for radiation protection by healthcare providers
- c. Provides opportunity for informed discussions between patients and healthcare providers.
- d. Strive to deliver the lowest dose possible to create diagnostic-quality images and follow the ALARA (as low as reasonably achievable) principle.
- e. Assessing the patient's renal and hepatic function and changing the protocol according to the results.
- f. Timely reporting of critical tests, communication of critical results, medication labeling, hand hygiene, preventing infections, medication reconciliation, reducing harm from falls, and performing universal protocols for preventing surgery that involves the wrong site, the wrong procedure, or the wrong person
- g. Critical tests & examinations that are so critical that, regardless of the findings, a telephone or face-to-face report is communicated within a predetermined time.
- h. Radiographic studies should be labeled with the correct patient identification and right or left markers before the patient begins the radiologic examination to avoid unnecessary radiation exposure and unnecessary administration of IV contrast material.
- i. Perform medication reconciliation by examining the list of the patient's current medications and ensuring that any medication that would be administered within the radiology department will not result in an adverse event for the patient.

**10. Provide basic and advanced life saving support services:** (BLS& ALS) in emergency situations.

**11. Knowledge of treatment of adverse reactions to contrast media.**

## **V.SYLLABUS**

### **Course contents:**

#### **a) Anatomy**

Gross and cross sectional anatomy of all the body systems.

#### **b) Pathology**

Gross morphology of pathological conditions of systemic diseases affecting all organ systems.

#### **c) Radiology Course**

This would cover imaging and interventions of diseases affecting all the body systems:

- Chest
- Cardiovascular system
- Musculoskeletal including soft tissue
- Gastrointestinal system
- Hepato-biliary-pancreatic system
- Urogenital (genito-urinary) system
- CNS including head and neck
- Obstetrics and gynaecology
- ENT, eye, dental, breast
- Endocrine and metabolic system
- Clinically applied radionuclide imaging

Body System	Develop an appropriate imaging strategy for the following presentation	Recognize imaging features of the following conditions
1. Chest / Thoracic radiology	<ul style="list-style-type: none"> <li>• Dyspnoea</li> <li>• Cough</li> <li>• Haemoptysis</li> <li>• Chest pain</li> <li>• Chest wall mass</li> <li>• Hoarseness</li> <li>• Stridor / wheeze</li> <li>• Thoracic trauma</li> <li>• Abnormal lung function tests</li> <li>• Incidental lung nodule</li> </ul>	<ul style="list-style-type: none"> <li>• Respiratory tract tumors</li> <li>• Pleural diseases including pneumothorax</li> <li>• Mediastinal and hilar masses</li> <li>• Airspace pathology including respiratory infection</li> <li>• Small airways disease</li> <li>• Bronchiectasis</li> <li>• Chronic obstructive pulmonary disease</li> <li>• Interstitial, inflammatory, granulomatous and autoimmune lung disease</li> <li>• Immune mediated respiratory disease</li> <li>• Occupational lung disease</li> <li>• Cystic lung disease</li> <li>• Smoking related disease</li> <li>• Pulmonary vascular disease and pulmonary embolism</li> <li>• Trauma</li> <li>• Acute lung injury / ARDS</li> </ul>

<b>2. Cardiovascular system</b>	<ul style="list-style-type: none"> <li>• Acute chest pain</li> <li>• Stable chest pain</li> <li>• Cardiovascular chest trauma</li> <li>• Exertion shortness of breath</li> <li>• Stroke and paradoxical embolism</li> <li>• Syncope</li> <li>• Sudden collapse</li> <li>• Palpitation with confirmed arrhythmia</li> </ul>	<ul style="list-style-type: none"> <li>• Cardiac arrhythmias</li> <li>• Cardiac failure</li> <li>• Coronary heart artery and its complications</li> <li>• Valvular heart disease</li> <li>• Common congenital heart disease</li> <li>• Heart muscle disease / cardiomyopathy</li> <li>• Heart failure</li> <li>• Disease of the arteries including aortic dissection</li> <li>• Acute aortic syndrome</li> <li>• Disease of the pulmonary circulation</li> <li>• Heart muscle disease / cardiomyopathy</li> <li>• Pericardial disease</li> <li>• Pulmonary embolism</li> <li>• Stroke and paradoxical embolism</li> <li>• Cardiac tumors and masses</li> </ul>
<b>3. Central Nervous System</b>	<ul style="list-style-type: none"> <li>• Abnormal sensory or motor function</li> <li>• Speech disturbance</li> <li>• Autonomic dysfunction</li> <li>• Abnormal behavior</li> <li>• Confusion</li> <li>• Memory loss and intellectual decline</li> <li>• Head injury</li> <li>• Headache</li> <li>• Seizures</li> <li>• Visual loss</li> <li>• Cranial nerve palsy and pain</li> <li>• Symptoms of cord or nerve root compression</li> <li>• Congenital malformations / syndromes</li> </ul>	<ul style="list-style-type: none"> <li>• Head and spine trauma</li> <li>• Intracranial and spinal haemorrhage</li> <li>• Ischaemia and infarction</li> <li>• Venous sinus thrombosis</li> <li>• Atheroma and dissection</li> <li>• Vascular malformation</li> <li>• Brain and spinal cord tumours</li> <li>• Dementia and cognitive disorders</li> <li>• Chronic neurological disability</li> <li>• Motor neuron disease</li> <li>• Movement disorders e.g. Parkinson's disease</li> <li>• CNS infections e.g. meningitis, encephalitis and abscess</li> <li>• Demyelination</li> <li>• Neurosarcoid and vasculitis</li> <li>• Headache syndrome e.g.</li> </ul>



		migraine <ul style="list-style-type: none"> <li>• Epilepsy</li> <li>• Congenital disorders and phakomatoses</li> <li>• Myopathies</li> <li>• Peripheral neuropathy (acute and chronic)</li> </ul>
<b>4. Endocrine and metabolic system</b>	<ul style="list-style-type: none"> <li>• Pituitary disorders</li> <li>• Adrenal disorders</li> </ul>	<ul style="list-style-type: none"> <li>• Pheochromocytoma</li> <li>• Paraneoplastic syndromes</li> </ul>
<b>5. Breast Imaging</b>	<ul style="list-style-type: none"> <li>• Pain / tenderness in breast</li> <li>• Lump in breast</li> <li>• Discharge from nipple</li> </ul>	<ul style="list-style-type: none"> <li>• Benign breast disease</li> <li>• Fibrocystic breast disease</li> <li>• Breast malignancy</li> </ul>
<b>6. Musculoskeletal including soft tissue</b>	<ul style="list-style-type: none"> <li>• Bone pain / deformity</li> <li>• Joint pain / deformity</li> <li>• Back pain</li> <li>• Soft tissue / bony lump</li> <li>• Acute and chronic injuries of tendons, muscles and ligaments</li> <li>• Symptoms of cord nerve root compression</li> <li>• Scoliosis</li> <li>• Rash and weakness</li> </ul>	<ul style="list-style-type: none"> <li>• Trauma (acute and chronic)</li> <li>• Infection</li> <li>• Tumors / tumors - like lesions</li> <li>• Spinal cord / cauda equina compression</li> <li>• Haematological disorders</li> <li>• Metabolic bone disorders</li> <li>• Endocrine bone disorders</li> <li>• Degenerative and infective disc disease</li> <li>• Congenital and developmental lesions</li> <li>• Multisystem rheumatic disorders</li> <li>• Connective tissue disorders</li> <li>• Crystal related arthropathies</li> <li>• Osteoarthritis</li> <li>• Osteoporosis</li> <li>• Rheumatoid arthritis</li> <li>• Spondyloarthritides</li> </ul>

<b>7. Gastrointestinal and hepatobiliary radiology</b>	<ul style="list-style-type: none"> <li>• The acute abdomen</li> <li>• Abdominal trauma</li> <li>• Abdominal pain - acute / chronic</li> <li>• Abdominal mass</li> <li>• Dysphagia</li> <li>• Change in bowel habit</li> <li>• Gastrointestinal haemorrhage</li> <li>• Anaemia</li> <li>• Weight loss</li> <li>• Diarrhea, steatorrhea</li> <li>• Jaundice / abnormal LFTs</li> </ul>	<ul style="list-style-type: none"> <li>• GI tract tumors</li> <li>• Liver tumors</li> <li>• Pancreatic - biliary tumors</li> <li>• Diseases of the oesophagus, stomach, small bowel colon and rectum</li> <li>• Malabsorption</li> <li>• Continence disorders</li> <li>• Diseases of the gallbladder, and biliary tree</li> <li>• Diseases of the pancreas including acute and chronic pancreatitis</li> <li>• Diseases of the liver - focal and diffuse</li> <li>• Herniae, volvulus and intussusception</li> </ul>
<b>8. Urogenital (genito - urinary) system</b>	<ul style="list-style-type: none"> <li>• Haematuria</li> <li>• Dysuria</li> <li>• Polyuria</li> <li>• Proteinuria</li> <li>• Loin pain</li> <li>• Urosepsis</li> <li>• Renal failure</li> <li>• Hypertension</li> <li>• Micturition difficulties</li> <li>• Raised PSA</li> <li>• Scrotal pain</li> <li>• Scrotal mass</li> <li>• Renal and genitourinary trauma</li> </ul>	<ul style="list-style-type: none"> <li>• Renal tumor</li> <li>• Ureteric / bladder tumor</li> <li>• Prostate tumor</li> <li>• Testicular tumor</li> <li>• Adrenal tumor</li> <li>• Acute and chronic renal failure</li> <li>• Renal replacement therapies</li> <li>• Nephrotic syndrome</li> <li>• Urolithiasis</li> <li>• Renovascular disease</li> <li>• Cystic renal disease</li> <li>• Urinary tract infections</li> <li>• Urinary tract obstruction</li> <li>• Benign prostatic hyperplasia</li> <li>• Prostatic neoplasms</li> </ul>
<b>9. Head and neck radiology</b>	<ul style="list-style-type: none"> <li>• Neck lump</li> </ul>	<ul style="list-style-type: none"> <li>• Head, neck and skull base</li> </ul>

including ENT, orbits (including eye ) and dental	<ul style="list-style-type: none"> <li>• Stridor and hoarseness</li> <li>• Swallowing difficulties</li> <li>• Hearing loss</li> <li>• Tinnitus and vertigo</li> <li>• Facial, oral, dental and neck pain and swelling</li> <li>• Facial and skull base trauma</li> <li>• Trismus and TMJ dysfunction</li> <li>• Epistaxis</li> <li>• Otalgia and aural discharge</li> <li>• Epiphora</li> <li>• Proptosis</li> <li>• Nasal polyps</li> <li>• Anosmia / hyposmia</li> </ul>	<ul style="list-style-type: none"> <li>• tumors</li> <li>• Lymph node pathology</li> <li>• Thyroid and parathyroid diseases</li> <li>• Orbital disease</li> <li>• Temporal bone, inner and middle ear disorders</li> <li>• Vestibular dysfunction</li> <li>• TMJ disease</li> <li>• Cranial nerve disorders</li> <li>• Salivary gland disease</li> <li>• Paranasal sinus disease</li> <li>• Dental disease</li> <li>• Vascular and lymphatic malformations</li> <li>• Maxillary and mandibular lesions</li> </ul>
<b>10. Obstetrics and gynecology</b>	<ul style="list-style-type: none"> <li>• Dysfunctional menstrual bleeding</li> <li>• Abnormal vaginal bleeding</li> <li>• Abdominal / pelvic pain</li> <li>• Pelvic mass</li> <li>• Abdominal distension</li> <li>• Primary and secondary amenorrhoea</li> <li>• Abnormal tumors markers</li> <li>• Infertility</li> <li>• Prolapse symptoms</li> <li>• Postpartum complications</li> </ul>	<ul style="list-style-type: none"> <li>• Ovarian cysts and tumors</li> <li>• Polycystic ovaries</li> <li>• Congenital uterine anomalies</li> <li>• Uterine tumors</li> <li>• Cervical tumors</li> <li>• Adenomyosis</li> <li>• Endometriosis</li> <li>• Pelvic inflammatory Disease</li> <li>• Fallopian tube disease</li> <li>• Pelvic floor dysfunction</li> <li>• Early pregnancy and complications</li> <li>• Ectopic pregnancy</li> <li>• Gestational trophoblastic disease</li> <li>• Postpartum complications</li> </ul>
<b>11. Pediatric radiology</b>	<ul style="list-style-type: none"> <li>• Abdominal pain, vomiting, mass</li> <li>• Cough, breathlessness, wheeze, stridor</li> <li>• Precocious / delayed puberty, ambiguous genitalia</li> <li>• Failure to thrive</li> <li>• Limp</li> <li>• Trauma including suspected non-accidental</li> </ul>	<ul style="list-style-type: none"> <li>• Acute neonatal and childhood abdominal conditions</li> <li>• Acute and chronic chest conditions in neonates and children</li> <li>• Cardiac and mediastinal abnormalities</li> <li>• Conditions affecting the genitalia</li> <li>• Childhood tumors</li> </ul>

	injury <ul style="list-style-type: none"> <li>• UTI, haematuria, testicular pain</li> <li>• Pelvic pain, mass</li> <li>• Headache, diplopia, epilepsy, back pain, paralysis</li> </ul>	<ul style="list-style-type: none"> <li>• Non-traumatic childhood conditions</li> <li>• Accidental and non-accidental injury in children</li> <li>• Disorders of the urinary tract</li> <li>• Acute neurological conditions</li> <li>• Congenital conditions</li> <li>• Systemic diseases in children</li> </ul>
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## Radiological physics

1. Introduction of general properties of radiation and matter: Fundamentals of nuclear physics and radioactivity
2. Interaction of x-rays and gamma rays with matter and their effects on irradiated Materials
3. X-ray Generating Apparatus
4. Screen-film radiography
5. Film processing: Dark room, dry processing, laser /dry chemistry cameras, artifacts
6. Fluoroscopy: Digital including flat panel units, fluoroscopy cum radiography units
7. Digital radiography: Computed Radiography, Flat panel radiography
8. Other equipments: Ultrasound including Doppler, CT, MRI and DSA
9. Contrast Media (Iodinated, MR & Ultrasound) - types, chemical composition, mechanism of action, dose schedule, route of administration, adverse reaction and their management
10. Nuclear Medicine: Equipments and isotopes in various organ systems and recent Advances
11. Picture Archiving and Communication System (PACS) and Radiology Information System (RIS) to make a film-less department and for Teleradiology
12. Radiation protection, dosimetry and radiation biology
13. Image quality and Quality Assurance (QA)

#### 14. Recent advances in radiology and imaging

The student should have knowledge of the following physics

- experiments: Check accuracy of kVp and timer of an X ray unit
- Check accuracy of congruence of optical
- radiation field Check perpendicularity of x ray
- beam
  - Determine focal spot size
- Check linearity of timer of x ray
- unit Check linearity of mA
- Verification of inverse square law for
  - radiation
- Check film screen contact and resolution
  - Determine total filtration of an x ray unit
- Processor quality assurance test
- Radiological protection survey of an x ray
- unit Check compatibility of safe light
- Check performance of view
- box Effect of kVp on x ray
  - output

### **Radiography and processing techniques**

1. Processing techniques: includes dark room and dry processing.
2. Radiography of the musculo-skeletal system including extremities.
3. Radiography of the chest, spine, abdomen and pelvic girdle.
4. Radiography of the skull, orbit, sinuses.
5. Contrast techniques and interpretation of GI tract, hepato-biliary tract, pancreas, etc.
6. Contrast techniques and interpretation of the Central Nervous system.
7. Contrast techniques and interpretation of the cardiovascular system including chest.
8. Contrast techniques and interpretation of the genito - urinary system including

Obstetrics and Gynaecology.

9. Paediatric radiology including MCU, genitogram, bone age.

10. Dental, portable and emergency (casualty) radiography.

## **VI. TEACHING AND LEARNING METHODS**

**The training is spread over 3 years and includes following components:**

1. Physics related to imaging
2. Rotational posting in various sub-specialties.

**During the three-year course, suggested rotations within department are as follows:-**

1. Conventional radiography including contrast procedures like IVU, HSG, barium studies, fluoroscopic guided interventions, fistulogram, and mammography. - 10 months
2. Ultrasonography and Doppler - 10 months
3. CT and CT guided interventions- 7 months
4. MRI - 3 months
5. Emergency Radiology - 2 months
6. Intervention Radiology - 2 months

**Elective/Suggested rotations in other departments are as follows: -**

- a. First year: Anatomy - 2 weeks
- b. Second year: Emergency medicine - 1 month
- c. Third year: PET and nuclear medicine - 2 weeks

During each posting, post graduate student should be able to perform the procedures and interpret the findings.

1. **Theory Lectures:** Lectures are conducted by the faculty on every Saturday evening on 1-hour duration on selected topics.
2. **Tutorials:** Tutorials are conducted on every Saturday morning with pre-decided topics; students are encouraged to actively participate in the discussions.
3. **Journal Club:** Recommended to be held once a week on Thursday. All the PG students are expected to attend and actively participate in discussion and enter in the logbook with relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. The time table for the subject with names of the students and the moderator should be announced in advance.
4. **Subject seminar:** Recommended to be held once a week on Wednesday. All the PG students are expected to attend and actively participate in discussion and enter in the logbook with relevant details. The presentations would be evaluated using checklists and would carry weightage for internal assessment. The time table for the subject with names of the students and the moderator should be announced in advance.
5. **Case discussion / Group discussions:** Recommended to be held once a week on Friday. All the PG students are expected to attend and actively participate in discussion and enter in the logbook with relevant details. The presentations would be evaluated using checklists and would carry weightage for internal assessment. The time table for the case presentation with names of the students should be announced in advance.
6. **Self-Directed Learning (SDL):** SDL sessions are to be conducted once a week on



Tuesday. All the PG's are expected to participate in SDL teaching. The evaluation will be done based on the check list and carry weightage for the internal assessment.

7. **Spotters:** Spotters are conducted once a week on Friday where a set of 10-20 spotters (radiographs / CT & MRI / ultrasound images) are shown to the post-graduate students and quizzed on the same. The answers of the spotters are later displayed and a brief teaching session and discussion on the topic is held. In the teaching session the students are briefed about the characteristic imaging findings of every spotter. The session will conclude with a doubt session in which students can clarify all their doubts. Spotters are an integral part of our radiology curriculum and 100 marks are reserved for the same in the university examinations.
8. **Clinico-Pathological conference:** Recommended once a month for all post graduate students. Presentation to be done by rotation. Presentations will be assessed using checklist. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
9. **Inter Departmental Meetings:** Once a month
  1. **Neuro-paediatrics:** Interesting cases and imaging modalities will be discussed. Emphasis should be given for the radiological differential diagnosis.
  2. **Orthopaedics:** Interesting cases and imaging modalities will be discussed. Emphasis should be given for the radiological differential diagnosis.
  3. **Surgery(Urology):** Interesting cases and the imaging modalities should be discussed. Emphasis should be given for the radiological differential diagnosis.
10. **Small group discussions (SGD):** Case based small group discussions will be carried out once a week.
11. **Skills lab:** Simulation based skill lab training will be conducted once a week for all the post graduate students. Basic intervention radiology techniques in non-vascular intervention like FNAC of thyroid nodules, breast tissue and renal biopsy. Evaluation will be conducted for each skill lab session in the form of a skill lab questionnaire. Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
12. **Mortality Meeting:** Will be conducted twice in year. The post graduate student should

prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting.

- 13. Teaching Skills:** Post graduate students must teach under graduate students (Eg. Medical, Radiography, Nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. assessment is made using a check list by medical faculty as well as by the students. Record of the participation is to be kept in a logbook
- 14. Continuing Medical Education Programmes (CME):** Recommended that at least 1 state level CME programmes should be attended by each student during the course.
- 15. Conferences:** Attending conference is compulsory. Post -graduate student should attend at least one National and one state level conference during the course. It is mandatory for the degree students to present one paper/poster in a National/State level conference and publish an article in a National / International journal, so as to make him / her eligible to appear at the post graduate degree examination.
- 16. Basic course in Biomedical research: Acquiring** competency in research methods is an integral part of postgraduate medical training in the country. To ensure that postgraduate medical students acquire the necessary skills, the National Medical Commission has made it mandatory for all postgraduate students to complete an online course in Research Methods - Basic course in Biomedical Research conducted by the National Programme on Technology Enhanced Learning (NPTEL) in the first year and must submit the certificate generated on successful completion of the course and examination.
- 17.** Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
- 18. Research activities:** Post graduate students to be encouraged to carry research activities in the department other than dissertation work.
- 19. Interesting Video Lectures:** Interesting video lectures of International repute will be shown to the post-graduate students once a week wherein the students will be updated about the recent advances and trends in diagnostic imaging.
- 20. Guest lectures:** Periodically guest lectures are conducted by the eminent Radiologist / Subject expert for the benefit of the students to acquire latest skill / knowledge.

## **VII. Other Criteria to Fulfill for the Degree Course:**

### **1. Maintenance of E-log book:**

Every candidate shall maintain a Log Book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log Book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log Book and it should be verified and signed by the faculty member. The Log Book shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the University practical/clinical examination.

### **2. Dissertation:**

Every post graduate student should carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which should be written up and submitted in the form of a Thesis (Dissertation). Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis should be submitted at least six months before the Theory and Clinical / Practical examination. The thesis will be examined by a minimum of two external examiners, who will not be the examiners for Theory and Clinical examination. A post graduate student will be allowed to appear for theory and practical examinations only after thesis acceptance by all evaluators before the conduct of University Examination.

### **3. Paper publication / Poster presentation/ Oral presentation:**

The post-graduate student would be required to present one poster presentation, to read one paper at a national/ state conference and have minimum one research paper published in journal of his / her specialty as first author which should be published in or accepted for publication or sent for publication to a peer reviewed journal, during the period of his/her postgraduate studies so as to make him/her eligible to appear at the post-graduate degree examination.

## **VIII. ASSESSMENT**

### **a) FORMATIVE ASSESSMENT, during the training programme**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

#### **General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and practical/clinical examination.

#### **Quarterly assessment during the MD training should be based on:**

1. Journal based / recent advances learning
2. Patient based / Skill based learning
3. Self-directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Periodic tests: The department should conduct one theory and one practical examination of 100 marks each at the end of an academic term and one preliminary examination two months before the final examination. The pattern for preliminary examination should be same as final examination. The practicals should be conducted as per OSCE format (Objective structured clinical examination)

During the course of three years the Department will conduct

- A. Basic sciences and physics examination of the 1st year PG students at the end of 1st year.
- B. Theory and practical examinations at the end of each academic year.
- C. One preliminary and one final examination

Results of all evaluations should be entered into P. G's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skill and balance broader concept of diagnostic and therapeutic challenges.

**Attendance of 80% is mandatory to appear in University examination.**

## **b) SUMMATIVE ASSESSMENT, i.e., assessment at the end of training of 3 years**

The summative examination will be carried out as per the Rules given in **postgraduate medical education regulations, December 2023.**

### **SCHEME OF EXAMINATION:**

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and dissertation is accepted & passing of NPTEL examinations.

#### **1. Thesis:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis (Dissertation). Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature. Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

#### **2. Theory: 400 Marks**

There shall be four papers, each of three hours duration. Total marks of each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

Type of question	No. of question	Marks for each question	Total Marks
Short Essay	10	10 marks	100

#### **Paper - I**

Basic sciences as applied to Radio-Diagnosis - Radiological Anatomy, Physiology, Pathology, Radiography, Radiation Physics and Biology. Basics of Ultrasound CT, Nuclear Medicine, PET CT & MRI.

#### **Paper - II**

Cardiovascular system, Respiratory system, GIT (including Hepato biliary), Endocrine, Mammography, Lymphatic System, Arteriography, Phlebography.

#### **Paper - III**

Genitourinary, Retroperitoneum, Musculoskeletal System, Obst. & Gynaec,

#### **Paper - IV**

1. CNS including head and neck
2. Interventional Radiology
3. Recent advances

Note: The distribution of chapters / topics shown against the papers are suggestive only.

### **3.Clinical / Practical Examination: 300 Marks (Total)**

(a) Dissertation: 20 marks

(b) OSPE: 25 (5 stations x 5marks)

- Modules based Ultrasound & Colour Doppler Demonstration

(c) Cases: 180 marks

To elicit competence in clinical skills and to discuss differential diagnostic and therapeutic aspects.

Types of Cases	No. of Cases	Marks
Long Case	1	100
Short Case	2 (40 marks each)	80
Total		180

### **(D) Subject specific assessment**

Types	No. of spotters	Marks
Spotters	25x3	75

### **(b) Viva- voce Examination: 100 Marks**

**Aims:** To elicit candidate's knowledge and investigative/therapeutic Skills.

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents like

- Radiation Physics and quality assurance
- Implements, Catheters and contrast
- Cassettes, films, dark room, equipment
- Radiographic techniques, Radiological procedures,
- Gross pathology

In addition candidates may be given case reports , X-rays, ultrasound, CT scan & MRI images for interpretation and questions on these as well as use of instruments will be asked. Student's knowledge on use of instruments and drugs pertaining to the Radiodiagnosis department will also be evaluated during viva-voce examination. It includes discussion on dissertation also:

**1. Newer imaging techniques and instrumentation: 20 marks**

**2. Physics Viva-voce : 40 Marks**

**3. Log book : 10 marks**

**4. Film Reading session : 15 marks**

**5. Ultrasonography Session : 15 Marks**

The examinations shall be organized on the basis of Grading or Marking system to evaluate and to certify post-graduate student's level of knowledge, skill and competence at the end of the training.

		<b>TOTAL PRACTICAL MARKS 400</b>		
<b>MAXIMUM MARKS FOR RADIO-DIAGNOSIS</b>	<b>THEORY</b>	<b>PRACTICAL / CLINICAL</b>	<b>VIVA-VOCE</b>	<b>GRAND TOTAL</b>
	<b>400</b>	<b>300</b>	<b>100</b>	<b>800</b>

**OBTAINING A MINIMUM 50% AGGREGATE MARKS IN THEORY (MINIMUM 40% IN EACH PAPER) AS WELL AS PRACTICAL SEPARATELY SHALL BE MANDATORY FOR PASSING THE EXAMINATION AS A WHOLE.**

**University shall conduct not more than 2 examinations in a year, with an interval of not less than 4 months and more than 8 months between the two examinations.**

**RECOMMENDED BOOKS (LATEST EDITIONS):**

<b>Sl. No</b>	<b>Name of the Book</b>	<b>Name of the author</b>	<b>Publisher</b>
1)	Text Book of Radiology and Imaging Vol I & Vol II	Sutton	Churchill Livingstone

2)	Diagnostic Radiology Vol I , II	Ronald G Grainger	Churchill Livingstone
3)	Positioning in Radiology	Clark	CBS
4)	Ultrasonography in obstetrics & Gynecology	Callen	Saunders
5)	Radiographic Anatomy	Butler	Cambridge
6)	Principles of nuclear medicine	Wagner	W.B. Saunders
7)	Diagnostics Radiology CT & MRI of whole body Vol. I & II.	Haaga	MOSBY
8)	Pediatric X-ray diagnostic vol. I & II	Caffey's	Churchill Livingstone
9)	Skeletal Radiology	Yochum	Lippincott
10)	Chest Radiology	Fraser & Muller (Synopsis)	Saunders
11)	Alimentary Tract and Imaging	Gore	Saunders
12)	MSK Radiology	Kaplan	Saunders
13)	Diagnostic Ultrasound Vol. I & II	C. Rumack	Elsevier
14)	Christensen's physics of Diagnostic Radiology	Curry T.S. & Dowdey J.E.	Lea & febiger
15)	Pediatric X-ray diagnostic Vol. I & II	Caffey's	Churchill Livingstone
16)	Colour Doppler	Zwiebel Allen	Elsevier Churchill Livingstone
17)	Radiological Procedures	Bhushan Lakhkar Whitehouse	Avichal Blackwell
18)	Diagnostic Ultrasound Vol . I & II	Cosgrove	Churchill Livingstone
19)	Diagnostic Radiology CT & MRI whole body Vol I & II	Lee & Sagel	Ubran Schwarzenberg
20)	Text book of Neuro imaging	Osborn	MOSBY
21)	Radiology review Manual (Differentials)	Danhert	Lippincott
22)	Radiology of skeletal disorders	Jacobson's	Elsevier
23)	Radiology of the kidney and Genito-urinary tract	Davidson's	Saunders
24)	High Resolution CT of the lung	Webb	Wolters Kluwer



25)	Head & Neck Imaging	Som & Curtin	Elsevier
26)	Magnetic Resonance Imaging Vol I & II	Stark & Bradley	Mosby
27)	Atlas of MR imaging of Brain and spine	Scott W	Wolters Kluwer
28)	General Ultrasound	Mittelstaedt C	Churchill Livingstone

## RECOMMENDED JOURNALS :

Sl. No	Name of Journal
1)	Indian Journal of Radiology and imaging
2)	Clinical Radiology
3)	British journal of Radiology
4)	American Journal of Roentgenology
5)	Radiology clinics in North America
6)	Recent Advances in Radiology and Imaging
7)	Lancet
8)	Journal of Diagnostic Medical Sonography
9)	Seminar in Ultrasound,CT,MRI
10)	Clinical Nuclear Medicine
11)	Journal of Vascular and Interventional Radiology
12)	Journal of computer assisted Tomography
13)	Radiographics
14)	Radiology (RSNA)
15)	American Journal of Neuroradiology

## POSTGRADUATE STUDENTS APPRAISAL FORM

Name of the PG Student:

Period of Training: FROM.....TO.....

Sr. No.	PARTICULARS	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1.	Patient based / Skill based learning				
2.	Self-directed learning and Teaching				
3.	Journal based / recent advances learning				
4.	Small Group Discussions				
5.	Clinical Skills lab				
6.	Performing Intervention & Non-Vascular Interventions				
7.	Interdepartmental learning activity				
8.	External and Outreach Activities / CMEs				
9.	Thesis / Research work				
10.	Participation in State level & National level conferences				
10	Basic course on Biomedical Research				
12.	Log Book Maintenance				
13.	Patient care				
14.	Interpersonal Skill				
15.	Professionalism				
16.	Attitude, Ethics &				

	Communication				
17.	Participation in extra-curricular activities				

Poster in State/National conference----- Yes/ No

Paper in State/ National conference ----- Yes/ No

Publications --- Yes/ No

Remarks\* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

\*REMARKS: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

**SIGNATURE OF ASSESSEE**

**SIGNATURE OF CONSULTANT**

**SIGNATURE OF HOD**

## POST GRADUATE DEGREE COURSE (M.D.) IN PULMONARY MEDICINE

### I. GOALS:

The Postgraduate training course would be to train a MBBS doctor who will:

- Practice efficiently and effectively, backed by scientific knowledge and skill base.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing education in the speciality irrespective of whether he is in a teaching institution or in the speciality.
- Be able to diagnose and manage common respiratory problems in the society, including emergencies, in adults and children.
- Be able to perform common diagnostic as well as therapeutic interventions including FNAC, lung biopsy, pleural biopsy, intercoastal drainage procedures, Fibreoptic Bronchoscopy and Medical Thoracoscopy.
- Be able to initiate and wean the patients with acute respiratory failure from medical ventilation.
- Be able to interpret polysomnography reports in sleep disordered patients.
- Be able to practice **National Tuberculosis Elimination Programme** including PMDT in the community.
- Be a motivated 'teacher'- defined as a specialist keen to share his knowledge and skills with a colleague or a junior or any learners.

### II. OBJECTIVES:

The following objectives are laid out to achieve the goals of the course. These objectives are to be achieved by the time the candidate completes the course. The Objectives may be considered under the subheadings.

1. Knowledge (Cognitive domain)
2. Skills (Psycho motor domain)
3. Human values, ethical practice and communication abilities.

## 1. Knowledge:

- Describe aetiology, pathophysiology, principles of diagnosis and management of common respiratory problems including emergencies, in adults and children.
- Describe aetiology, pathophysiology, and principles of diagnosis and management of uncommon respiratory problems in the society.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion.
- Describe common thoracic malignancies in the country and their management including prevention.
- Demonstrate understanding of basic sciences relevant to the respiratory speciality.
- Identify social, economic, environmental and emotional determinants in a given case, and take them into account for planning therapeutic measures.
- Recognize conditions that may be outside the area of his/her speciality/ competence and to refer them to the proper specialist.
- Advise regarding the operative or non-operative management of the respiratory cases and to carry out this management effectively.
- Update oneself by self study and by attending courses, conferences and seminars relevant to the speciality.
- Teach and guide his team, colleagues and other students in understanding the speciality.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with the aim of publishing his work and presenting his work at various scientific forums.
- Understand the importance of HIV infection and AIDS on the respiratory system.
- Participate in the Revised National Tuberculosis Control Programme (NTEP) including PMDT and disseminate the knowledge to the patients and their relatives.
- Participate and practice NTEP and NACO programmes.
- Understand the importance of communication and collegial interaction between the consultant and primary physician.
- Demonstrate professionalism in all interactions with patients and their families, other physicians and all other members of the health care team.
- Appreciate the need for a commitment to lifelong self-education and evidence-based medical practice in order to provide the highest quality of care.
- Recognize the clinical manifestations of acute respiratory failure and manage them effectively including mechanical ventilation.
- Recognize respiratory complications in a surgical patients and manage their complications.
- Able to assess the patients for lung transplantations and know their part operative complications.

## 2. Skills:

The Post-graduate programme prepares the students to develop interviewing skills in Pulmonary Medicine-history taking, performing physical examination, and formulating diagnostic and therapeutic plans.

### i)Cognitive Skills:

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and other relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Performing clinical consults on in-patients and out-patients.
- Generating reports of clinical encounters and letters to referring physicians.
- Provide basic and advanced life saving support services (BLS & ALS) in emergency situations.
- Undertake complete patient monitoring including care of the patient.
- Learn practical applications of pulmonary function tests:
  - a. Interpret pulmonary function tests, including spirometry, lung volumes, diffusing capacity and bronchoprovocation tests.
  - b. Become familiar with the structure and function of the pulmonary function laboratory.
- Radiologic studies:
  - i) Learn proper interpretation of chest x-ray and thoracic CT scans.
  - ii) Learn to formulate a differential diagnosis based upon the interpretation.
  - iii) Learn to interpret chest ultrasonographic findings in various pulmonary abnormalities.
  - iv) Learn to interpret Bronchography films.
  - v) Learn to interpret ventilation perfusion scans of lungs.
- Develop expertise in respiratory care:
  - i) Interact with respiratory care personnel.
  - ii) Become familiar with structure and function of a respiratory care department.
- Become familiar with the out patient clinics in related disciplines and pulmonary subspecialties including:
  - i) Bronchial asthma
  - ii) COPD
  - iii) Sarcoidosis/ ILD
  - iv) Allergic disorders.
- Learn practical applications of sleep studies, including polysomnography.
- Learn about various modes of mechanical ventilation including newer modes of ventilation.
- Learn about maintaining the patient on mechanical ventilation, weaning and complications there of.
- Learn graphic interpretation of mechanical ventilation.
- Learn interpretation of acid-base gas disturbances.
- Learn interpretation of ECG.

### ii). Procedural Skills:

Familiarity with pulmonary and critical care medicine procedures.

- Observe, assist and perform Fibreoptic bronchoscopic procedures for therapeutic and diagnostic purposes:
  - i. Bronchoalveolar lavage.

- ii. Endobronchial biopsies and needle aspiration.
  - iii. Transbronchial biopsies and needle aspiration.
  - iv. Foreign body removal.
  - v. Other related procedures.
- Observe and assist in medical thoracoscopy procedure including plural biopsy, take insufflation and adhesiolysis.
- Perform thoracentesis and pleural biopsies.
- Perform fine needle aspiration biopsy (FNAC) of lung and mediastinal tumours.
- Perform Tru-cut biopsy of the lung and mediastinal tumours.
- Perform pleurodesis procedures.
- Perform intercoastal tube drainage procedures.
- Perform Allergy testing and advice regarding Immunotherapy.
- Perform ultrasonography guided pleural fluid aspirations or biopsy of mediastinal and lung tumours.
- Perform CT guided pleural fluid aspirations, or biopsy including FNAC of mediastinal and lung tumours.
- Observe and assist in chest ultrasonographic procedures for various lung pleural diseases.
- Learn and perform endotracheal intubation.
- Learn to initiate and maintain the patient on mechanical ventilation.
- Learn to wean off the patient from mechanical ventilation.
- Learn to initiate the patient on non-invasive ventilation.
- Perform arterial puncture for ABG analysis, central venous lines placement.
- Perform sleep study (polysomnography) and interpret the analysis.
- Perform Ziehl- Neelsen staining technique for acid fast bacilli (AFB).
- Skill management: For the above procedures, the post-graduate students must become familiar with:
  - i. Indications for the various procedures.
  - ii. Educating patients regarding the risk benefit ratio of each procedure and the availability of alternate procedures.
  - iii. Medical preparation of the patient for each procedure.
  - iv. Possible complications.
  - v. Specimen processing and data interpretation.
  - vi. Patient monitoring during and after the procedure.
  - vii. Record keeping and generation of clinical reports.

### iii) Tertiary Objectives:

Once trained, the post graduate student should be able to:

- i) Set up pulmonary unit independently or in hospitals and medical colleges.
- ii) Carry out and help conduct research in Pulmonary and Medical sciences, communicate the results of such research at medical conferences and publish in medical journals.
- iii) Guide research projects of students and critically evaluate the results of their investigations.

### 3. Human values, Ethical practice and Communication abilities

- Adopt ethical principles in all aspects of his/her practice; professional honesty and integrity are

to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.

- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standard while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed,
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

### III. COURSE CONTENTS:

The course content for the degree course is exhaustive and is not limited to the respiratory system. Basic diseases in Internal Medicine also forms the part of this course contents.

#### i). Theory:

i. Basic Sciences including Anatomy, Physiology, Pathology, Microbiology and Pharmacology in relation to Respiratory System.

ii. Arterial blood gas analysis, acid-base and electrolytes disturbances.

iii. Tuberculosis

- Pulmonary tuberculosis
- All forms of Extrapulmonary tuberculosis
- Drug resistance in tuberculosis
- MDR, XDR
- Atypical mycobacteriosis
- Newer diagnostic methods
- Newer drugs in tuberculosis
- Allied topics in tuberculosis
- Surgical aspects of tuberculosis
- RNTCP, PMDT
- Recent advances in tuberculosis
- Pregnancy and tuberculosis
- HIV infection and tuberculosis

iv) Non-Tubercular Respiratory Diseases

1. Respiratory physiology
2. Immunology of respiratory diseases
3. Respiratory pharmacology
4. Respiratory muscles
5. Pulmonary surfactant
6. Upper respiratory tract infection
7. Allergic rhinitis and sinusitis
8. Lung inflammation, injury and repair.
9. Embryology and development of the respiratory system
10. Developmental anomalies of the respiratory system
11. Genetic approach to lung diseases.
12. Pneumonias



13. Atypical pneumonias
14. Fungal infections of the lungs
15. Viral infections of the lungs
16. H1N1 and Avian Flu pneumonia & COVID 19 Infection.
17. Protozoal infections of the lungs
18. Zoonotic diseases of the lungs
19. Helminthic diseases of the lungs
20. Aspergillus lung diseases
21. Lung abscess
22. Bronchiectasis
23. Cystic fibrosis
24. Chronic obstructive pulmonary disease.
25. Surgery in COPD
26. Bronchial asthma
27. Pulmonary eosinophilia, PIE syndromes
28. Pulmonary arterial hypertension
29. Parasitic diseases of the lungs
30. Sarcoidosis
31. Wegner's granulomatosis
32. Cigarette smoking and lungs
33. Occupational lung disorders
34. Environmental disorders of the lungs
35. Drug induced lung diseases
36. Interstitial lung diseases
37. Connective tissue diseases and the lungs
38. Depositional disorders of the lungs
39. Pulmonary hemorrhage syndromes
40. Disorders of the pulmonary circulation
41. Hypoventilation and hyperventilation syndromes
42. Sleep physiology and sleep apnea syndromes
43. Neoplasms of the lungs
44. Metastatic malignant tumours
45. Aspiration syndromes of the lungs
46. HIV infections and AIDS
47. Pulmonary complications in HIV and AIDS
48. Evaluation of respiratory impairment/ disability
49. Acute respiratory failure
50. Type II Respiratory Failure
51. Acute Respiratory Distress Syndrome
52. Preoperative evaluation of a surgical case
53. Respiratory failure in surgical case
54. Respiratory failure in poisoning cases
55. Respiratory failure in neurosurgical emergencies
56. Mechanical ventilation
57. Noninvasive ventilation
58. Diseases of the pleura
59. Pneumothorax
60. Diseases of the mediastinum

61. Diseases of the diaphragm
62. Disorders of the spine and chest wall including kyphoscoliosis
63. Thoracic trauma
64. Respiratory emergencies –respiratory failure, hemoptysis, aspiration, drowning, pulmonary edema, pneumonias, pneumothorax, chest trauma.
65. Electrical burns
66. Hanging
67. Respiratory diseases at high altitude, air travel, aviation and space.
68. Lung physiology and diseases in deep sea diving and drowning.
69. Sepsis and septic syndrome
70. Critical Care and Assisted Ventilation:
  - i. Resuscitation of the critically ill including MODS
  - ii. Ventilatory applications, assessment and monitoring
  - iii. Cardiopulmonary mechanics
  - iv. Ventilatory care and support
  - v. Weaning off ventilation
  - vi. Comprehensive care of the comatose
71. Respiratory manifestations of systemic disorders
72. Prevention of lung diseases
73. Computed tomography and MRI of the thorax
74. Nuclear medicine for chest physicians
75. Pulmonary function testing including diffusion study and total lung volumes estimation.
76. Bronchoscopy and related procedures
77. Bronchial stenting
78. Radiographic techniques in respiratory medicine
79. Medical thoracoscopy
80. Clinical exercise testing
81. Air pollution and lungs
82. Lung at extreme environments
83. Respiratory diseases during pregnancy
84. Pulmonary complications of heart disease
85. Lung in obstetrics and gynaecological diseases
86. Pulmonary complications of endocrine diseases
87. Pulmonary complications of neuromuscular diseases
88. Pulmonary complications of hematologic diseases
89. Pulmonary complications of abdominal diseases
90. Pulmonary complications of organ transplantation and primary immunodeficiencies
91. Acute lung injury due to toxins, gases, fumes and burns
92. Allergic urticaria
93. Angioedema and anaphylaxis
94. Food allergy
95. Ocular allergy
96. Insect allergy
97. Adverse drug reactions
98. Paediatric Pulmonology:
  - a) Respiratory problems in children
  - b) Infective pneumonias
  - c) Childhood tuberculosis

- d) Neonatal distress syndrome
- e) Bronchopulmonary dysplasia
- f) Congenital malformation
- g) Bronchial asthma
- h) Specific management problems in children
- 99. Pulmonary rehabilitation
- 100. Lung transplantation and Immunosuppressive Drugs.
- 101. Smoking hazards and cessation
- 102. Patient education and compliance
- 103. Care at the end of life for patients with respiratory failure
- 104. Diabetes mellitus and complications
- 105. Ischemic heart diseases
- 106. Rheumatic heart diseases
- 107. Valvular heart diseases
- 108. Pericardial effusion
- 109. Myxoedema and thyrotoxicosis
- 110. Addison's disease
- 111. Hypertension
- 112. Alcoholic liver diseases
- 113. Nephrotic syndrome
- 114. Congestive cardiac failure
- 115. Acute and chronic renal failure
- 116. Literature review and statistics
- 117. Medical ethics
- 118. Evidence based medicine in Respiratory Medicine
- 119. Pulmonary Radiology and Imaging
  - Interpretation of plain radiograph, contrast studies, CT scan, ultrasound examination, bronchogram.
  - Interpretation of ventilation/perfusion scans.
  - Interpretation of Pulmonary Angiography

**ii). Practical:**

- Pulmonary functions testing
- Spirometry
- Diffusion study
- Bronchodilator and Bronchoprovocation testing
- Exercise testing
- Measurement of airway resistance
- Bronchoscopy and allied procedures
- Intercoastal tube drainage procedure
- Medical Thoracoscopy and allied procedures.
- Pleurodesis
- Thoracentesis
- Pleural biopsy
- Lung biopsy
- Arterial puncture
- FNAC of lung and mediastinum
- CT guided/ USG guided biopsy of lung/ mediastinum

- Allergy testing
- Immunotherapy
- Tuberculin testing
- Hypersensitivity skin testing
- Endotracheal intubation
- Cardiopulmonary resuscitation
- Pulmonary artery catheterization
- Assisted ventilation
- Respiratory physiotherapy including IBBL and nebulization
- Endotracheal intubation
- Initiation, maintenance and weaning of mechanical ventilation
- Central venous line placement
- Ziehl-Neelsen staining of sputum for mycobacteria (AFB).
- Gram staining of the slides
- Sleep studies and Polysomnography.
- Miscellaneous procedures required in patient care.
- Basic life support.
- Advanced life support.

#### IV. TEACHING AND LEARNING ACTIVITIES:

##### A. Theoretical Teaching:

1. **General Principles:** Acquisition of Practical competencies being the keystone of PG medical education, PG training should be skill oriented. Learning in PG program should be essentially self-directed and Primarily emanating from clinical and academic work. The formal sessions are merely meant to supplement this core effort.  
In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary. The departments may select a mix of the sessions, as given under formative assessment.
2. **Lectures:** Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated. Lectures will be taken by the staff 15 lecture in each semester will be taken.
3. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book the relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.
4. **Subject Seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator should be announced in advance.
5. **Case Discussion:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The

presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the case presentation with names of the students should be announced in advance.

6. **Ward Rounds:** Ward rounds may be service or teaching rounds.

a). Service Rounds: Postgraduate students should do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.

b). Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose at the bed side. A diary should be maintained for day-to-day activities by the post-graduate students.

Entries of (a) and (b) should be made in the Log book.

7. **Clinico-Pathological Conference:** Recommended once a month for all post graduate students. Presentation to be done by rotation. Presentations will be assessed using checklist. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

7. **Inter Departmental Meetings:** Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a month. These meetings should be attended by post-graduate students and relevant entries must be made in the Log Book.

Pathology: Interesting cases shall be chosen and presented by the post-graduate students and discussed by them as well as the senior staff of Pathology department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advanced immuno-histo-chemical techniques, the burgeoning markers, other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed. Emphasis should be given for the radiological differential diagnosis.

8. **Mortality Meeting:** The mortality meeting should be conducted in the department every month. The post graduate student should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting.

9. **Teaching Skills:** Post-graduate students must teach under graduate students ( eg. Medical, Nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by medical faculty as well as by the students. Record of their participation is to be kept in Log Book. Training of postgraduate students in Educational Science and Technology is recommended.

10. **Continuing Medical Education Programmes (CME):** Recommended that at least 1

state level CME programmes should be attended by each student during the course.

11. **Conferences:** Attending conference is compulsory. Post-graduate student should attend one national and one state level conference during the course.
12. **Research Activities:** The Post-graduate students to be encouraged to carry out research activities in the department other than dissertation work. It is recommended by me, That each candidate should publish at take one scientific paper in peer review journal before appearing for the theory university examination. Each student should present one paper/poster in the CME.

## **B) Clinical / Practical Training:**

### **1. Rotational Postings in other Departments:**

- i). In the parent department of Pulmonary Medicine- 31 months
- ii). Department of Medicine - 1 month
- iii). Cardiology - 1 month
- iv). Department of Radio- diagnosis - 1 month
- v). Casualty and ICU (1 Month each) - 2 months / 3 Months Rotatory District Posting

## **v. Other Criterias to be Fulfilled for the Degree Course:**

### **1. Internal evaluation:**

During the course of three years, the department will conduct three tests. Two of them will be annual, one at the end of first year and other at the end of second year. The third test will a preliminary examination which may be held three months before the final examination. The test may include the written papers, practicals / clinicals and viva-voce.

Formative assessment should be done by OSCE for the examination.

Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the University when called for.

Results of all evaluations should be entered into P.G's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

### **2. Maintenance of Log Book:**

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the University practical/clinical examination.

**3. Dissertation:** Every candidate pursuing MD degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation. Dissertation should be submitted 6 months before the university examination.

# **ASSESSMENT**

**FORMATIVE ASSESSMENT, ie., assessment during training**

Formative assessment should be continual and should assess medical knowledge, Patient care, procedural & academic skills, interpersonal skills, professionalism, self, directed learning and ability to practice in the system.

## **General principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The internal Assessment should be conducted in theory and practical /clinical examination.

Yearly assessment during the MD training should be based on:

- 1 Journal based/recent advances learning
- 2 Patient based/laboratory or skill based learning
- 3 Self directed learning and teaching
- 4 Department and interdepartmental learning activity
- 5 External and outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate Student appraisal form (Annexure/I).

**SUMMATIVE ASSESSMENT, ie., assessment at the end of training**

The summative examination would be carried out as per Rules given in POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000

## **VI. SCHEME OF EXAMINATION:**

Candidates will be allowed to appear for examination only if attendance is minimum



80% and internal assessments are satisfactory and dissertation is accepted.

**i) Theory :**

**400 Marks**

There shall be four papers, each of three hours duration. Total marks of each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

Type of Questions	No. of Questions	Marks for each question	Total Marks
Short essay	10	10	100
Grand Total			100

Paper I : General Pulmonary medicine and Basic Sciences.

Paper II: Clinical Pulmonary medicine including Critical Care and Emergency.

Paper III: Clinical Pulmonary Medicine and Tuberculosis.

Paper IV: Recent advances in Pulmonary Medicine, and Research Methodology.

**Note :** The distribution of chapters/topics shown against the papers are suggestive only and may overlap or change.

**B. Clinical / Practical Examination:**

**200 Marks**

To elicit competence in clinical skills and to discuss differential diagnostics and therapeutic aspects.

Types of Cases	No. of Cases	Marks
Long Case	1	100
Short Cases	2 (50 marks each)	100
<b>Total</b>	<b>3</b>	<b>200</b>

**C . Spotters :**

**100 Marks**

There will be **10** spotters for the examination each carrying 20 marks each. These are kept to elicit the knowledge on Equipment's, pathology, specimens, x-rays, CT scans, PFT reports, sleep study reports etc.

which are relevant to assess the clinical knowledge of the patient.

**D. Viva- Voce Examination:**

**100 Marks**

**Aims:** To elicit candidate's knowledge and investigative/ therapeutic skills.

**1). Viva-voce examination –**

**80 Marks**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be given case reports, spirometry, ABG, gross specimens, histo-pathology slides, X-rays, ultrasound, CT scan images, PFT report, ventilation-perfusion scan images, polysomnography reports etc., for interpretation and questions on these as well as use of instruments will be asked. Student's knowledge on use of instruments and drugs pertaining to the respiratory system will also be evaluated during viva-voce examination. It includes discussion on dissertation also.

**2) Pedagogy Exercise and Log Book –**

**20 Marks**

- (i) Candidate is asked to make a presentation for 8 – 10 minutes on a topic given at the beginning of clinical examination after consultation with the external examiners.
- OR
- (ii). Candidate is asked to make a presentation for 8 – 10 minutes on the dissertation topic and the review of Log Book.

**D. Maximum Marks:**

Maximum marks for M.D. Pulmonary Medicine	Theory	Practical	Viva-voce	Spotters	Grand Total
	400	200	100	100	800

## **VII. RECOMMENDED BOOKS (Latest editions) :**

Sr. No.	Name of the Textbook	Authors	Publisher
1.	Crofton & Douglas's Respiratory Diseases	Seaton A, Leitch A.G. Seaton D.	Blackwell Scientific
2.	Fishman's Pulmonary Diseases and Disorders	Fishman AP, Elias J.A, Fishman J.A, Grippi M.A, Kaiser L.R, Senior R.M.	McGraw Hill
3	Textbook of Pulmonary and Critical Care Medicine	Jindal SK, Shankar P.S. D. Gupta, D. Raoof S, Aggarwal, AN	Jaypee Publishers
4.	Text Book on Tuberculosis	Rao K.N.	Kotari Book Depot, Bombay
5.	Chest Roentgenology	Felson B	W. B. Saunders Company U.S.A. & AITBS, India
6.	Pulmonary Medicine	Behera D.	Jaypee Brothers
7.	Principles of Chest x-ray Diagnosis	Simon G.	Butter worth & Jaypee Brothers
8.	Tuberculosis Case finding and Chemotherapy	Toman. K.	WHO, Geneva
9.	Clinical Tuberculosis	Davies P. D. O.	Chapman & Hall
10.	Clinical Tuberculosis	Crofton J, Horne N, Miller F.	W. B. Saunders
11.	Tuberculosis and Non-Tuberculosis Mycobacterial Infections	Schlossberg D.	McGraw Hill
12.	Nadel and Murray's Textbook of Respiratory Medicine	Mason R, Broaddus V, Murray J, Nadel J.	Elsevier Saunders
13	Pleural Diseases	Light R.W.	Lippincott's, Williams & Wilkins
14	Principles of Critical Care Medicine	Udwadia F.E.	Oxford University Press
15	Fundamentals of sleep	Richard Berry	Elsevier
16	High Resolution CT of the Lung	W Richard Webb, N. Muller, DP Naidich	Walter klewer
	The Normal Lung	Murray J.F.	W. B. Saunders

17.			
18.	Textbook of Tuberculosis	S. K. Sharma	Jaypee Publishers
19.	Tuberculosis	Rom W.N, Garay S.M.	Little, Brown
20.	Davidson's Principles and Practice of Medicine	Boon N, Colledge N, Walker B, Hunter J.	Elsevier
21	Harrison's Principles of Internal Medicine	Kasper DL, Braunwald E, Fauci A.S, Hauser S.L, Longo D.L, Jameson J.L.	McGraw Hill

## VIII. RECOMMENDED JOURNALS:

Sr. No.	Name of the Journal
1.	American Journal of Respiratory and Critical Care Medicine
2.	European Respiratory Journal
3.	Clinics in Chest Medicine
4.	Chest
5.	Respiratory Medicine
6.	Thorax
7.	Annals of American Thoracic Society

8.	Current Opinion in Pulmonary Medicine
9.	International Journal of Tuberculosis and Lung Disease
10.	Indian Journal of Chest Diseases and Allied Sciences
11.	Indian Journal of Tuberculosis
12.	Lung India
13.	Journal of Allergy and Clinical Immunology
14.	Respirology
15.	International Journal of COPD

#### ADDITIONAL READING (LATEST EDITIONS)

1. Indian Council of Medical Research, "Ethical Guidelines for Biomedical Research on Human Subjects", I.C.M.R, New Delhi.
2. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi.
3. Francis C M, Medical Ethics, J P Publications, Bangalore,
4. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi.
5. International Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted to biomedical journals, N Engl J Med.
6. Kirkwood B R, Essentials of Medical Statistics, Oxford: Blackwell Scientific Publications.
7. Mahajan B K, Methods in Bio-statistics for medical students, New Delhi, Jaypee Brothers Medical Publishers.
8. Compendium of recommendations of various committees on Health and Development (1943-1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, Min. of Health and Family Welfare, Govt. of India, Nirman Bhawan, New Delhi.
9. National Health Policy, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi.
10. Srinivasa D K et al, Medical Education Principles and Practice, 1995. National Teacher Training Centre, JIPMER, Pondicherry

## Annexure I

**Postgraduate Student Appraisal Form**  
**Pre/Para/Clinical Disciplines**

Name of the Department /Unit :

Name of the PG student :

Period of training : FROM .....To.....

Sr. NO	PARTICULAR	Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1	Journal based /recent Advances learning				
2	Patient based /Laboratory or skill based learning				
3	Self directed learning And teaching				
4	Departmental and interdepartmental learning activity				
5	External and outreach Activities / CMEs				
6	Thesis /Research Work				
7	Log book Maintenance				

Publications

Remarks\* \_\_\_\_\_

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\*Remarks: Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HOD

**POST GRADUATE DEGREE COURSE  
M.D. IN COMMUNITY MEDICINE**

**Preamble:**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

‘Community Medicine’ is an academic subject, a branch of Medicine which deals with promotion of health and prevention of diseases, involving people’s participation, utilizing professional management skills. The Community Medicine specialist, will inculcate a holistic view of health and medical interventions primarily focused on Community Health/Population Health. Thus, he/she should be equipped with the knowledge, skills, competencies in primary, secondary & tertiary care, control and prevention of outbreaks/epidemics, community diagnosis, health needs assessment, epidemiological assessment, research and planning evidence-based health policies and programmes.

The Guidelines for teaching Community Medicine, therefore, have been designed to create a cadre of professionals who are competent to meaningfully contribute their expertise in planning, implementation, co-ordination, monitoring, evaluation of Primary Health Care Programs based on scientific evidence. The competencies will cover a wide spectrum of skills viz., technical, managerial, administrative, organizational skills, applied skills in Health Information Management, software application and soft skills of communication, motivation, decision-making, team building, training in scientific communication and medical writing.



## I.

### 1. GENERAL GOALS OF POSTGRADUATE MEDICAL EDUCATION PROGRAMME

The goal of postgraduate medical education shall be to produce competent specialists and/or Medical teachers:

- Who shall recognize the health needs of the community, and carry out professional obligations ethically and in keeping with the objectives of the national health policy;
- Who shall have mastered the competencies, pertaining to the specialty, that are required to be practiced at the secondary and the tertiary levels of the healthcare delivery system;
- Who shall be aware of the contemporary advance and developments in the discipline concerned;
- Who shall have acquired a spirit of scientific inquiry and are oriented to the principles of research methodology and epidemiology; and
- Who shall have acquired the basic skills in the teaching of medical professionals.

### 2. GENERAL OBJECTIVES OF POST-GRADUATE TRAINING EXPECTED FROM STUDENTS AT THE END OF POST-GRADUATE TRAINING

At the end of the postgraduate training in the discipline concerned the students shall be able to:

- Recognize the importance of the concerned specialty in the context of the health needs of the community and the national priorities in the health sector.
- Practice the specialty concerned ethically and in step with the principles of primary healthcare.
- Demonstrate sufficient understanding of the basic sciences relevant to the concerned specialty.
- Identify social, economic, environmental, biological and emotional determinants of health in a given case, and

take them into account while planning therapeutic, rehabilitative, preventive and promotive measure/strategies.

- Diagnose and manage majority of the conditions in the specialty concerned on the basis of clinical assessment, and appropriately selected and conducted investigations.
- Plan and advice measures for the prevention and rehabilitation of patients suffering from disease and disability related to the specialty.

### **3. COMPONENTS OF THE POSTGRADUATE CURRICULUM:**

The major components of the Postgraduate curriculum shall be:

- Theoretical knowledge
- Practical and clinical skills
- Publication/submission of a Research article in Scientific journals or Presentation of the paper in National Conference of the concerned Society.
- Soft skill attributes including communication skills.
- Training in research methodology, Medical Ethics and Medico legal aspects.

#### **General Objectives:**

- Demonstrate skills in documentation of individual case details as well as morbidity and mortality rate relevant to the assigned situation.
- Demonstrate empathy and humane approach towards patients and their families and exhibit interpersonal behavior in accordance with the societal norms and expectations.
- Play the assigned role in the implementation of national health programme, effectively and responsibly.
- Organize and supervise the chosen/assigned health care services demonstrating adequate managerial skills in the clinic/hospital or the field situation.

- Develop skills as a self-directed learner, recognize continuing education needs; select and use appropriate learning resources.
- Demonstrate competence in basic concepts of research methodology and epidemiology, and be able to critically analyze relevant published research literature.
- Develop skills in using educational methods and techniques as applicable to the teaching of medical/nursing students, general physicians and paramedical health workers.
- Function as an effective leader of a health team engaged in health care, research and training.

### **SPECIFIC GOALS:**

A candidate upon successfully qualifying in the M. D. Community Medicine Examination should be competent to be:

1. Teacher and Trainer
2. Researcher
3. Public Health Specialist
4. Epidemiologist
5. Health Team Leader

### **II. OBJECTIVES:**

#### **Subject specific objectives: (Community Medicine)**

1. To create a skilled cadre of medical professionals having expertise in application of principles of Public Health, Community Medicine and applied epidemiology, contributing meaningfully in formulating National Health Policies & Programmes with a systems approach for overall human development.
2. To standardize the teaching & training approaches at post- graduate level, for Community Medicine
3. Research: To formulate research questions, do literature search, conduct study with an appropriate study design and study tool; conduct data collection and management, data analysis and report.

**Subject specific competencies:** At the end of the course, the PG student should be able to acquire the following competencies under the three domains, Cognitive, Affective and Psychomotor:

**A. Cognitive domain**

**The student should be able to:**

1. Describe conceptual (and applied) understanding of Public Health, Community Medicine, clinical and disease-oriented approach, preventive approach & health promotion, disease control & promotion.
2. Have knowledge about communicable and non-communicable diseases, emerging and re- emerging diseases, their epidemiology, control and prevention.
3. Apply the principles of epidemiology, health research and Bio-statistics, application of qualitative research methods
4. Calculate Odds Ratio, Relative Risk, Attributable risk and other relevant health and morbidity indicators.
5. To describe nutritional problems of the country, role of nutrition in health and disease and to describe common nutritional disorders
6. Develop nutrition plan for an individual based on his requirements and with concerns to special situations if applicable
7. Plan comprehensive programme to address issue of malnutrition in a given area for a specific group
8. To describe the concept of Environmental Health and its various determinants.
9. Identify environmental health issues in a given area/community
10. Assess impact of adverse environmental conditions on health of human beings
11. Plan awareness programmes at various levels on environmental issues and mobilize community resources and participation to safeguard from local adverse environmental conditions
12. Should be able to provide technical advice for water purification, chlorination,

- installing go-bar gas plant, construction of soakage pits etc.
13. Be a technical expert to advice on protection measures from adverse environmental exposure
  14. To describe the working of Primary Health Care system, Panchayat Raj system, National Health Programmes, urban/rural differences, RMNCH & Adolescent Health, Demography and Family Welfare.
  15. Do orientation of the inter-linkage of health sector and non-health sectors for promotion of Health & control and prevention of diseases.
  16. Have familiarity with administrative procedures and protocols.
  17. Have knowledge about role of media and its use in health.
  18. Have knowledge of Health Care Administration, Health Management and Public Health Leadership
  19. To describe Health Policy planning, Medical Education Technology, Information Technology and integration of Alternative Health systems including AYUSH.
  20. To describe the intricacies of Social & Behavioral Sciences and their applications.
  21. To describe Public Health Legislations
  22. To understand and describe International Health & Global Diseases surveillance.
  23. To relate the history of symptoms with specific occupation, diagnostic criteria, preventive measures, identification of various hazards in a specific occupational environment and legislations.
  24. To keep abreast of recent advances in Public Health & formulate feasible, optimal, sustainable, cost-effective strategies in response to the advances in public health & development.
  25. To describe the principles of Health Economics and apply it in various public health settings.
  26. To explain and correlate common health problems (medical, social, environmental, economic, psychological) of urban slum dwellers, organization of health services in urban slum areas.

27. Develop workable interventions for control and prevention of emerging and re-emerging diseases at local, national and global level.
28. Identify behaviour pattern of individual or group of individuals detrimental or adversely affecting their health.
29. Define and identify vulnerable, under-privileged high-risk communities and their special needs
30. To create awareness about various public health laws.
31. Evaluate cost-effectiveness and cost-benefits of a Health Programme.
32. Understand and express implications of 'Poverty Line', 'Social Inclusion', 'Equity', 'taxations', 'Insurance' on Health care management.
33. To categorize hospital/biomedical waste and be able to guide for proper disposal.
34. To provide a comprehensive plan for disaster management and mitigation of sufferings.

## **B. Affective domain:**

### **The student should be able to:**

1. Function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

## **C. Psychomotor domain:**

### **The student should be able to perform independently the following:**

1. Conduct community surveys for assessment of health & morbidity profile, epidemiological determinants, assessment of health needs, disease surveillance, evaluation of health programmes and community diagnosis.
2. Conduct epidemic investigations, spot maps, predict disease trends, preparation of reports, planning and implementation of control measures.
3. Demonstrate clinical skills of preparing case history, examination, provisional diagnosis, treatment and clinical case management and interpretation of laboratory findings. Conduct common procedures such as incision, drainage, dressings & injections.
4. Do data collection, compilation, tabular and graphical presentation, analysis and interpretation, applying appropriate statistical tests, using computer-based software application for validation of findings.
5. Conduct epidemiological research studies to establish cause-effect relationships in elaborating the epidemiology of diseases and health events.
6. Develop appropriate IEC Material, assessment of community communication needs, training skills, and counseling skills, conduct Health Education Programmes in urban and rural settings.
7. Conduct dietary surveys, assessment of nutritional status, nutritive values of common food menus, detection of food adulterants, use of lactometer, recording and interpretation of growth and development charts.
8. Use and apply various instruments and processes concerned with environmental health and biological waste management e.g. waste collection, segregation and disposal as per protocols, needle-disposers, disinfection procedures. Also, use of Dosi-meters, Kata / Globe Thermometer, Sling Psychrometer, Gobar Gas Plant, Soakage pit, Solar Energy, functioning of Ice Line Refrigerators, Deep Freezers, Cold Boxes and Vaccine Carriers.
9. Identify different types of mosquitoes; detect vector breeding places and

orientation of the methods of elimination of breeding places and placement of a mosquito-proof water tank.

10. Conduct clinical screening of various diseases and organize community health camps involving community participation in urban and rural settings. Use of Snellen's charts for vision, Ishihara's chart for colour blindness, tourniquet tests for dengue diagnosis in fever, BMI and other physical measurements of infants, children and adults etc., copper-T insertions and preparation of pap smear.
11. Conduct tests for assessment of chlorine demand of water (Horrock's Apparatus), procedure of well-water and urban water-tank chlorination, assessment of chlorination levels, physical examination of water, methods of domestic water purification, oriented in use of water filters.
12. Prepare health project proposals with budgeting based on the project objectives.

### **Miscellaneous skills:**

#### **The student should be able to:**

1. Devise appropriate health education messages for public health awareness using various health communications strategies.
2. Identify family level and community level interventions and facilitate the implementation of the same e.g., food hygiene, food storage, cooking demonstrations, community kitchen, kitchen garden, empowerment of women for promoting nutritional health etc.
3. Demonstrate counselling skills for family planning services.
4. Plan and execute behavioural change communication (BCC) strategy for individuals.
5. Conduct measurement of occupational exposure to harmful influences.
6. Diagnose occupational hazards and undertake surveys to identify occupational exposures as and when necessary.
7. Elicit appropriate response at individual and community level to prevent



occupational hazards including IEC activities at different levels.

8. Use modern IT applications especially internet & internet-based applications.

## **SYLLABUS M.D. Community Medicine (CBME)**

### **COURSE CONTENTS**

- 1. Conceptual (and applied) understanding of Public Health, Community Medicine, clinical disease-oriented approach, Preventive approach & Health promotion, disease control & promotion. Core**

#### **Learning objectives:**

At the end of this course topic, the student should be able to:

- a) Understand and explain the concept & application and give suitable analogies/examples related to Public Health/Community Medicine (with differences), Disease-oriented v/s Preventive approach, health promotion disease control & prevention.
- b) Explain correlation between health and human development with analogies/examples.
- c) Explain concept of Primordial, Primary, Secondary and Tertiary prevention with examples.
- d) Evolutionary History and mile-stones in Public Health – National and International levels.

- 2. Communicable and Non-Communicable diseases, emerging and re-emerging diseases Core**

#### **Learning objectives:**

At the end of this course, the student should be able to:

- a) Understand and explain Epidemiology of Communicable/Non-communicable diseases- its causes, precipitating factors, social & other non- health causes, mechanisms of transmission, signs/symptoms, management, control & prevention measures, related national Health Programmes & national Guidelines, Directives, special projects, if any.
- b) Explain application of Disease surveillance system in control of

Communicable/Non- communicable diseases.

- c) Explain & undertake steps to investigate & control outbreaks, epidemics and pandemics and take measures to prevent the same.
- d) Evolve prevention & control measures based on local & regional epidemiological funding, synchronizing with National guidelines.

### **3. Applied Epidemiology, Health Research, Bio-statistics** **Core**

#### **Learning objectives:**

At the end of this course, the student should be able to:

- a) Explain the concept & application of Epidemiology of Disease and Health, giving suitable examples.
- b) Explain Epidemiological approach, the terms Distribution & Determinants, uses, types of Epidemiological studies, interpretation, merits/demerits and limitations, odds ratio, relative risk, attributable & population attributable risks, Hybrid designs (with examples), validity of Epidemiological Data and application in practice at field level.
- c) Explain Epidemiological Research methods, Research related protocols, Literature review, estimating sample size, data collection/ compilation/Analysis/ Research, interpretation.
- d) Develop Health interventional programmes based on Epidemiological finding & create evidence for Public Health action.
- e) Understand difference between data, information & intelligence, types of data, survey methods, formulating questionnaires, interview schedule, data presentation types & analysis.
- f) Apply computer-based software application for data designing, data management & collation, analysis & interpretation e.g., SPSS, Epi-info, MS

office and other advanced versions.

## **4. Nutrition**

### **Core**

#### **Learning objectives:**

At the end of this course, the student should be able to:

- a) Identify various nutritional problems in the region, state and country and contributing factors for the same, with due emphasis on ecology perspectives.
- b) Explain importance of various nutrients (including micronutrients) in health, their sources, requirements and problems associated with their deficiencies as well as overconsumption.
- c) Plan balanced diet and dietary requirements of various age and sex groups.
- d) Dietary/nutritional concerns of vulnerable groups – young children, adolescents, ANC/PNC/Lactating mothers/senior citizens/individuals with various health problems e.g., hypertension, diabetes, renal problems etc.
- e) Classification of food, food additives, food fortification, food enrichment, food toxins and food adulteration.
- f) Explain Food production, Food hygiene and safety, food storage, food preparation, food wastage and feeding practices.
- g) Assessment of nutritional status of a community by adopting different methodologies.
- h) Nutritional supplementation, surveillance, education and rehabilitation.
- i) National Programmes in Nutrition and their evaluation.
- j) National Nutrition Policy.

## 5. Environmental health

### Core

#### Learning objectives:

At the end of this course, the student should be able to:

- a) Highlight importance of external environment (air, water, noise, radiation, temperature, ventilation, solid waste disposal, insects and vectors, domestic and country yard pests, industrial waste disposal etc. and its impact on ecology and human health.
- b) Elaborate on health issues related to housing, air, water, noise, radiation pollution i.e., size of problems, area and specific groups affected, measurement of pollution levels and health impact of the same, corrective measures
- c) Elaborate on requirements of water, water chlorination and household purification measures, measurement of chlorine demand, break-point chlorination levels, water quality.
- d) Assessment of quality of water and air, control of air pollution.
- e) Explain environmental sanitation and control measures (including appropriate technologies) – modern methods of sewage disposal, mechanical ventilation, soakage pits, gobar-gas plants, smokeless Chulha, solar energy, rainwater harvesting, sewage water recycling plants at society level etc.
- f) Explain global warming and its health impact.
- g) Elaborate on forest reserves, social forestry and health.
- h) Study vectors of medical importance and integrated control measures against them.
- i) Explain dynamics of transmission of vector borne diseases.
- j) Explain pest control measures.
- k) Explain environmental health issues in urban and rural areas.
- l) Understand functioning of public sector measures to safeguard environmental

health e.g., water purification plant.

m) Explain Legislative measures for protection of environmental health.

## **6. Primary Health Care System, Panchayat Raj, National Health Programmes including RCH, Demography & Family Welfare: Core**

### **Learning Objectives**

At the end of this course, the student should be able to:

- a) Explain the meaning of Primary Health Care with suitable analogies with reference to India, and be able to define the systems approach for implementation of Primary Health Care.
- b) Enumerate the elements, principles, population coverage norms, staff patterns, day to day activities, programme schedule, stakeholders at PHC level.
- c) Explain the scope and implications of three-tier system of Primary Health Care.
- d) Understand functioning of Rural Panchayat Raj system of development and its co-relation with health.
- e) Promote community participation in Primary Health Care programmes and motivate various stakeholders for the same.
- f) Understand and comply with medico-legal procedures related to Primary Health Care activities.
- g) Integrate, coordinate both health and non-health sectors for implementing various national health programmes.
- h) Deliver the provisions of various health schemes to eligible beneficiaries such as Janani Suraksha Yojana, Janani Shishu Suraksha Karyakram, Navajati Shishu Suraksha Karyakram, Rashtriya Bal Suraksha Karyakram, Rashtriya

Swasthya Bima Yojana, Ayushman Bharat - Arogya Karnataka Yojana etc.

- i) Impart training in health programmes for paramedical workers, lab technicians, community health volunteer's, interns and provide health education in the community.
- j) Implement Public Health Skills for investigations and containment of outbreaks & epidemics / pandemics.
- k) Understand history of evolution of public health, important milestones in the world and in India.
- l) Enumerate the various health committees established and their major recommendations since 1947-48 to till date & United Nations' MDG & SDG

## **7. Health Care Administration, Health Management and Public Health Leadership**

**Core**

### **Learning Objectives:**

At the end of this course, the student should be able to:

- a) Explain the conceptual difference between Administration and Management, Power and Authority with reference to health care.
- b) Explain the role of fundamental principles of constitution, principles of Democracy and its correlation with health care administration.
- c) Explain the role of Bureaucracy, Technocracy, Political system, Judiciary, Media and people in health care administration.
- d) Explain and identify the key positions and their role in health administration at State, District, Taluka (Tehsil block) and village level.
- e) Explain the frame work of health care system at State, District, Taluka & village level and understand the mechanism of coordination between bureaucrats, technocrats, political, judiciary and media at each of these levels.

- f) Enumerate functions of a manager, explain concepts of management and leadership styles, various management techniques, planning process, monitoring & evaluation skills.
- g) Should be sensitive to quality issues in health care management and comply with relevant quality management techniques.
- h) Formulate and manage team approach for implementing health programmes.
- i) Apply skills of effective human resource management and identify relevant roles, responsibilities and duties of functionaries.
- j) Implement skills of motivation, communication, negotiation and conflict management at PHC level.
- k) Develop budgetary statements based on evidence of needs assessment and be able to maintain account of expenditure as per norms.
- l) Undertake community health needs survey, conduct training & communication needs assessment of paramedical and health workers, identify vulnerable, underprivileged communities, implements high risk approach.

## **8. Health Policy, Medical Education (Core) & Integrating Alternative system of Medicine/AYUSH (Non-Core)**

### **Learning Objectives**

At the end of this course, the student should be able to:

- a) Understand and elaborate implications of the policy provision with reference to the current health scenario in the country.
- b) Explain the role of health policy in promotion of Primary Health care, ensuring equity, inter- sectoral co-ordination, appropriate technology and community



participation.

- c) Explain the various provisions for promotion of preventive and curative health services including National Health Mission, National Health Programmes, Quality Hospital based services, Medical Education and AYUSH.
- d) Critically appreciate merits and demerits of the National Health Policy.
- e) Explain SWOT analysis of the policy and debate on evidence-based recommendations, additions and deletions.
- f) Debate on suggestions or recommendations for future inclusions.

## **9. Social and behavioral sciences -**

### **Core**

#### **Learning objectives:**

At the end of this course, the student should be able to:

- a) Understand influence of social and behavioral practices on health.
- b) Understand principles of behavior change of an individual and community.  
Clearly understand difference between knowledge, attitude and practices.
- c) Understand importance of Social Medicine and health.
- d) Importance of Behaviour Change Communication (BCC).
- e) Socio-cultural factors influencing behaviour change.
- f) Formal and informal organizations in the community.
- g) Influence of peer pressure.
- h) Know the health problems, where BCC interventions are necessary.
- i) Understand factors promoting and detrimental to BCC.

## **10. Public Health Legislations – Core**

### **Learning objectives:**

At the end of this course, the student should be able to-

- a) Explain public health legislations and need for the same.
- b) Know in detail each public health law – when, why, implementation, impact, issues etc.
- c) Enforcement of various public health laws.
- d) Judiciary mechanism for ensuring proper implementation of public health laws.
- e) Scope for integrated approach for implementation of public health laws.

## **11. International Health**

**-Core**

### **Learning Objectives:**

At the end of this course, the student should be able to-

- a) Understand the need and scope for international health measures.
- b) Enlist and understand functioning of various U.N. Agencies (including WHO) playing key role in international health.
- c) Enlist and understand functioning of bilateral vs. multilateral international donor agencies.
- d) Provide advice to international travelers and vaccination requirements.
- e) Understand International health control measures e.g., quarantine & isolation and airports management etc.
- f) Understand the management of international ports from health perspectives.

## **12. Occupational Health**

**Core**

### **Learning Objectives:**

At the end of this course, the student should be able to:

- a) Understand the concept of occupational health and its importance, Occupational environment and work dynamics / Ergonomics.
- b) Know different types of occupational exposures at various settings.

- c) Enlist various occupational hazards and their relative magnitude.
- d) Understand measurement of exposure levels to harmful influences during occupation.
- e) Understand preventive and control measures against various occupational hazards – global, national and local level measures.
- f) Understand individual and community responses towards preventing exposure to occupational hazards.
- g) Understand and advise occupational safety measures.
- h) Understand legislative measures to prevent exposures to occupational hazards.
- i) Advise compensation provisions to persons exposed to various occupational hazards.
- j) Understand occupational health problems amongst people in unorganized sector
- k) Understand and advise social security and welfare provisions for workers –  
ESIS Act, Factory Act, Role of I.L.O., Ministry of Labour & DGFASLI.

### **13. The recent advances in Public Health & miscellaneous issues**

#### **Non-Core**

#### **Learning Objectives:**

At the end of this course, the student should be able to-

- a) Identify & enlist events at local, district, national & global levels influencing or adversely affecting health /medical issues of the population.
- b) Adopt & practise skills related to utilization of modern technology, software, IT application in the interest of health promotion & disease prevention.

## **14. Health Economics**

### **Non-core**

#### **Learning Objectives:**

At the end of this course, the student should be able to: -

- a) Describe the scope of Health Economics.
- b) Understand health market & its characteristics.
- c) Understand & apply Economic Evaluation techniques.
- d) Assess the mechanism of Funding Health Care services, especially health insurance.
- e) Advise on allocation of resources appropriately in their work area.

#### **COURSE CONTENTS FOR PRACTICALS:**

##### **1. Microbiology as applied to public health (posting in Dept. of Microbiology)**

- a) Interpretation of the following slides
  - Gram's stain
  - Albert's stain
  - Ziehl–Neelsen's stain
  - Peripheral blood examination of thick and thin smears and reporting
- b) Microscopic examination of urine, stool & sputum and interpretation
- c) Interpretation of commonly used serological tests such as Widal / HIV/ Hepatitis B / VDRL / Viral Antibody titers

##### **2. Medical Entomology**

- Identification of various vectors
- Entomological survey

##### **3. Epidemiological exercises and case studies (including family studies) to illustrate principles and practice of community health**

##### **4. Statistical exercises to illustrate principles and their application in practice.**

##### **5. Investigation of an outbreak of a disease and measures to control & prevention**

## **6. Exercise in public health administration**

- Planning exercises
- VED analysis etc.
- Beneficiary need analysis
- Preparation of annual plan
- Budgeting at the PHC level
- Supervision of a PHC / SC level
- Requirement of vaccines, medicines, stationary at the PHC level
- Organization of a family welfare camp
- To conduct an Immunization camp
- Organization of cataract detection camp
- Implementation of National Health Programmes at Health Centres (Rural & Urban).

## **7. Diet and Nutritional survey of a community**

## **8. Study of environment and its influence on health in**

- Work places
- Household
- Community
- Meteorological factors and their effects on health  
(study of air pollution, temperature, humidity and others)

## **9. Study of sanitation problems of the Community & Swachh Bharat Abhiyan**

## **10. Environmental sanitation**

- Collection of water sample/ analysis / reporting
- Analysis of physical, chemical and microbiological quality of water
- Study of waste management methods – Solid / Liquid / BMWM
- Water supply and waste disposal methods in an industrial or plantation Setting
- Rainwater Harvesting / Gobar Gas plant / Smokeless Chulha/ Solar water Heater/ Sulabh Shouchalay / Vermi-composting etc

## **11. Visits / Postings to the following institutions**

- District Health Office
- District Hospital

- Taluka hospital / Community Health Centre
- Field Publicity office
- ICDS Block office
- Sewage treatment plant / Biomedical Waste Management
- Meteorology department/Weather Monitoring Station
- Local NGO – Family Planning Association of India
- District Malaria Office / District TB Centre/ District NVBDCP Office
- National Tuberculosis institute, Bangalore
- Polio surveillance office / SMO, NPSP
- Visit to factory/ Industry
- Home for the aged
- Blind school / Deaf and Dumb school
- Physically handicapped centre / DDRC
- Slaughter house
- Hotel
- Milk dairy / KMF
- Cinema house/ Multiplex
- Food and beverages processing units
- National Institute of Nutrition, Hyderabad
- Centre for Preventive Medicine, Hyderabad/
- Institute of Public Health, Bengaluru
- Armed Forces Medical College, Pune (Entomology museum)
- ICMR National Institute of Virology, Pune
- ICMR National Institute of Epidemiology, Chennai
- ICMR National Institute of Traditional Medicine, Belagavi
- National Tuberculosis Institute, Bengaluru
- DIMHANS, Dharwad
- District Public Health Lab, Belagavi

## **TEACHING AND LEARNING METHODS**

### **Teaching methodology**

The following is a rough guideline to various teaching/learning activities that may be employed:

- i. **Journal Club:** Critical appraisal and discussion of research articles in peer reviewed & indexed journals with standard checklist – (once a week) & One article on Medical Education – once in three months

- ii. Seminar: (once a week) & Integrated Seminar (Once in three months)
- iii. **Lecture/Discussion:** Lectures on newer topics by faculty will be engaged (once a week for all the PG Students- on rotation by all faculty).
- iv. **Case presentation:** Communicable disease case presentation (focus on epidemiology, control, prevention) or Family case (focus on health needs assessment, SWOT analysis of family, social determinants and social empowerment, community management, role of primary health care and mobilizing resources for empowerment of the family). PG students will present the cases in presence of faculty and discuss various modalities of management & prevention, including socio-economic impact and concerned national health programmes.
- v. **Public Health Management training** in Immunization clinics, Disease Surveillance Units, General Preventive OPD, hands-on training in management of national health programmes at urban health centres and rural health centres along with orientation in health administrative system.
- vi. The PG student shall be required to participate in the **teaching and training programme of Undergraduate students and interns** in the Dept / Teaching Hospital / PHC / UHC. They will be trained in **Pedagogical techniques** and make presentations on selected topics for **large /small group teaching techniques**. PGs will also be trained on **Pedagogy & Adult Learning Principles** and **Medical Education Technology** & proper use of **Audio-Visual aids**.
- vii. The PG student must have attended **Mandatory training in Research Methodology** during his/her tenure, within one year of commencement of batch (**Online NPTEL ICMR Basic Course in Biomedical Research**) – (passing certificate with enrolment no).
- viii. A postgraduate student of a postgraduate degree course in broad specialties would be required to **present one poster presentation**, to **read one paper at a national/state conference** and to **present one research paper which should be**

**published/accepted for publication/sent for publication** during the period of his postgraduate studies, so as to make him/her eligible to appear at the postgraduate degree examination. *(Proof to be submitted during practical exams)*

- ix. **Special Seminars / Workshops / Webinars:** conducted by External Faculty on cross-cutting subjects directly or indirectly concerned with Health.
- x. **Log Book / Daily Diary:** Postgraduate students shall maintain a **log book / Daily Diary** of the work carried out by them and the training programme undergone during the period of training including details of work experience during their postings, including programmes implemented under supervision and those performed independently. The **Log book/ Daily Diary/ Practical Record / Case record books** shall be checked and assessed periodically by the faculty members imparting the training & HoD.
- xi. Department should encourage **e-learning activities** (E- Journal Club / Self Directed Learning) including online/distance learning (Swayam courses by NPTEL /UGC).
- xii. All postgraduate students shall complete course in **Medical Ethics & Professionalism** including **Good Clinical Practices (GCP) / Good Laboratory Practices (GLP)**.
- xiii. All postgraduate students shall complete a course in '**Basic Cardiac Life Support (BCLS) skills**' and get duly certified in the **clinical skills lab/ advanced simulation lab** of the medical college & teaching hospital. The students have to complete the course within one year of the commencement of the batch. (certificate to be produced with enrolment number.)
- xiv. Awareness in basics of management and audit - Awareness in Medical Audit, Management, Health Economics, Health Information System, basics of bio-statistics & tests of significance, exposure to



human behaviour studies and knowledge of pharmacy  
(Managing essential/emergency drugs at Teaching hospital / PHC / UHC) shall be imparted to the Post Graduate students.

- xv. **Others-** PG students shall attend training in other courses such as - Telemedicine, How to write a manuscript and make effective presentations, Use of PubMed and other resources etc. as required, whenever the institution / University arrange such trainings. PGs will also be oriented for NAAC, NABH, NABL, IPHS, ISO and various other quality/accreditation standards.

**xvi. Postings are given below:**

**Recommended schedule for three years training:**

**Orientation Training/Field postings for students of M.D.**

No.	Field Posting and work	Duration
01	Posting at Sub-centers & PHCs Under & at RHTC and UHTC attached to Dept of Community Medicine as per NMC norm	Total period of ONE year during the 3-year period of PG course. Posting at RHTC should be residential.
02	Posting in the teaching hospital for exposure to clinical departments namely Pediatrics, OBGYN & General medicine to acquire clinical skills for diagnosis and management of Communicable and Non-Communicable Diseases	Total - One month General Medicine-2 weeks Pediatrics -1 week Ob. & Gyn. -1 week Time of posting shall be at the discretion of local feasibility

03	District Residency Programme	3 months as per NMC Guidelines in collaboration with District Hospitals / DHO / District Surgeon
04	Work attachment to gain hands- on skills based, training in public health department & orientation in Health Administration and Management of various National Health Programmes and aspects of public health management at the offices of the DHO/DHS/THO/DTO/DMO/CDPO/ RCHO/MOH of Local Civic Body or district health authorities/ SMO, NPSP.	Total - One month Place & time of 2 postings of 2 weeks each shall be at discretion of local feasibility.
05	Short duration posting in various camps, melas, public health emergencies, investigation of epidemics, implementation of NHP, linen dept of hospital, Hospital kitchen, Hospital record section, central drug store, Medical Supdt. Office, blood bank, casualty dept., CCL, Hospital waste management, ART-VCTC, Matron Office (HRD), HMIS/MRD etc.	Total - one month Minimum of four postings of 1wk duration each shall be done subject to local feasibility.
06	Visits to various institutions of Public Health Importance.	Subject to local feasibility & permission from the concerned authority

During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of **Clinical Skills lab / Advance Simulation Lab** in medical college will be used.

## **PG Syllabus (M.D. Community Medicine) - Division of Topics for Teaching & Learning**

### **I Year I Term:**

1. Concept of Health & Disease, Control & Prevention
2. Conceptual (and applied) understanding of Public Health / Community Medicine & History of Medicine
3. Health Care Delivery System in India & Panchayati Raj Institutions.
4. Basic Epidemiology – Study Designs & Applied Epidemiology.
5. Health Research Methodology & Medical Ethics & Professionalism

### **I Year II Term:**

1. Social & Behavioural sciences
2. Family & Health
3. Nutrition & Health
4. Environmental Health
5. Biomedical waste Management
6. Basic Medical Statistics
7. Preventive Obstetrics, Geriatrics & Paediatrics, School Health – RMNCH+A

### **II Year I Term:**

1. Communicable Diseases, Hospital Acquired Infections
2. Screening for diseases, Emerging & Reemerging diseases
3. Non-Communicable Diseases
4. Health Information System
5. Microbiology, Parasitology & immunology, Serology & Vaccines

### **II Year II Term:**

1. Occupational health
2. Tribal health & Desert Medicine
3. Demography & Family Planning
4. Vital Statistics
5. Medical Audit
6. Information Technology & GIS

### **III Year I Term:**

1. Public Health Legislations and policies
2. International health and voluntary health agencies

3. Health Economics, National Health Programmes
4. Disaster Management, Genetics, Mental health, Pandemic management
5. Essential medicines and Counterfeit medicines
6. Tests of significance – Statistics.

**III Year II Term:**

1. Health care administration and hospital administration
2. Health planning management, Public Health Leadership
3. Medical Education Technology and Pedagogy
4. Integrating alternative system of Medicines – AYUSH
5. Recent Advances in Public Health / Community Medicine
6. Communication and Health Education (IEC & BCC) GCP / GLP
7. Scientific Communications & Medical Writing

## **ASSESSMENT**

**FORMATIVE ASSESSMENT, i.e., during the training may be as follows:**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

**Quarterly assessment during the M.D. training should be based on:**

1. Journal based / recent advances learning
2. Patient based / Laboratory or Skill based learning
3. Self-directed learning and teaching (including E-learning / Online courses)
4. Departmental and inter-departmental learning activity
5. External and Outreach Activities / CMEs / Workshops/ Conferences

**The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I).**

### **FORMATIVE ASSESSMENT**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

#### **1. Internal evaluation:**

During the course of three years, the department will conduct three tests. Two of them will be annual, one at the end of first year and other at the end of second year. The third test will be preliminary examination (organized at college level) which may be held six weeks before the final examination. The test shall include the written papers, practicals / clinicals and viva-voce. Records and marks obtained in such tests shall be maintained by the head of the department and shall be sent to the University

when called for.

Results of all evaluations should be entered into P.G. student's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

## **2. Maintenance of PG Log Book & Daily Diary / Practical Record Book / Case Discussion Record Book:**

Every candidate shall maintain a separate **PG Log book/work diary/ Practical Record book/ Case Discussion Record books** and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, pedagogy sessions etc. Special mention may be made of the presentations by the candidate as well as details of clinical (Family case / Hospital case) or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post-graduate students shall be entered in the Log book. All the daily activities performed on day-to-day basis shall be entered in the Log book / Daily diary and it should be verified and signed by the faculty member. The Log book / Daily Diary / Practical Record book / Case Discussion Record Book shall be scrutinized by the PG guide cum Mentor /moderator and certified by the Head of the Department and Head of the Institution, and presented in the University practical / clinical examination.

### **SUMMATIVE ASSESSMENT:**

The summative examination would be carried out as per the Rules given in **NMC / MCI Postgraduate Medical Education Regulation, 2000** and latest amendments.

#### **1. Dissertation:**

PG Dissertation shall be submitted at least **six months** before the **Theory and**

**Clinical / Practical examination.** The dissertation shall be examined by a minimum of three examiners (**Recognized PG Teachers**); one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post-graduate student shall be allowed to appear for the Theory and Practical / Clinical examination only after the acceptance of the Dissertation by the examiners / reviewers.

## 2. Theory Examination:

The Post Graduate examination shall be in three parts: - The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a **minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory** for passing examination as a whole. The examination for M.D. shall be held at the end of 3<sup>rd</sup> academic year. An academic term shall mean six month's training period.

There shall be **four theory papers** as follows:

<b>Paper I:</b> Conceptual (and applied) understanding of Public Health, Community
Medicine, Communicable and Non- Communicable diseases, emerging and re-emerging diseases, Microbiology, Parasitology, Immunology & Serology, Bio-statistics, screening for diseases, Applied Epidemiology Health Research.
<b>Paper II:</b> Nutrition, Environmental Health, Primary Health Care system, Panchayat Raj system, National Health Programs, RMNCH & A, Demography and Family Welfare, Health Care Administration, Health Management and Public Health Leadership.
<b>Paper III:</b> Social & Behavioural Sciences- applied aspects, scientific communications & Medical writing, Research Methodology & Ethics, Public Health Legislations, International Health & Global Diseases surveillance, Mental Health, Genetics &

**Paper IV:** Health Policy Planning, Medical Education Technology, Information Technology, Integration of Alternative Health system including AYUSH, Occupational Health, Recent advances in Public Health & Miscellaneous issues, Health Economics, Disaster management, Health planning & management, Communication for Health Education, Tribal Health & Desert Medicine.

### SCHEME OF EXAMINATION

Candidates are eligible to appear for university examination only if their **attendance is 'minimum 80%'** and their **'PG dissertation is accepted by the reviewers'** and they have cleared **'NPTEL ICMR BCBR Online course'** & trained in **'Basic Life support skills'**. Certification Course in ethics including **Good Clinical Practices** in the first year of the Course conducted by institution. Have minimum one **Poster Presentation** or podium presentation at a National/ Zonal/ State Conference. Have Minimum one **Research Paper** Published in Journal as First Author.

Type of Questions	No. of Questions	Marks for each question	Total Marks
Essay type	10	10 marks	100
<b>Grand Total</b>			<b>100</b>
<b>Number of papers = 4 x 100 marks each</b>			<b>400</b>

**Practical/Clinical and oral examination:** (400 marks)

The PG practical examination shall be conducted over two days, not more than 8 candidates per batch per day, as follows:

#### **PRACTICALS:**

**1. Family study:** (One long Family case from the community – UHC / PHC) (80 marks)

Socio-economic, demographic, cultural and holistic history taking, of the family to understand the various risk factors affecting health and quality of life, assessment of social support system, assessment of present morbidity and its



implications, evolve interventions for medical relief and social empowerment and role of family, community and primary health care system in resolving family issues. This shall be conducted preferably in the community setting (UHC/PHC).

**2: Two short cases (20 minutes each) – Cases with Communicable Diseases (from the teaching hospital) (90 Marks)**

**Clinico Social Case – One Case** 60 Marks

**Paper Case (Scenario Based) One Case** 30 Marks

Students will elaborate on clinico-epidemiological case history to assess the epidemiological factors, precipitating factors, probable source of infection and evolve measures for diagnosis, treatment, management with reference to the case as well as major public health concerns, i.e. Control, prevention of the diagnosed disease and interventions in case of eminent outbreak / epidemic situations. Short cases may be assessed without presentation of detailed history, beginning with Differential Diagnosis in the given time (in the teaching hospital attached to medical college). Scenario based Paper Cases will be discussed.

**3. Problems on Epidemiology and Biostatistics (Five) (50 Marks)**

Based on situation analysis from communicable or non-communicable diseases, RMNCH & A and Family Planning including Demography, Environmental health including Medical Entomology.

**Five problems will be given carrying marks as follows**

1. Statistical Problems (two) - each with 10 marks
2. Epidemiology Problems (three) - each with 10 marks

**4. OCSE (Five Stations) - (5 x 6 Marks each = 30 marks)**

OSCE Stations shall be on Nutrition, Environmental health including entomology and occupational health, RMNCH&A and Family Planning; Microbiology including parasites and vaccines & Public Health Laboratory (Titration, Horrocks).

**5. Pedagogy: Demonstration of teaching skills/techniques - (30 Marks)**

A pedagogy topic will be allotted to each PG candidate on the first day. PG Student is asked to make a short presentation on the topic on the second day for 20 minutes.

**6. Discussion on PG dissertation work: (20 Marks)**

**B. VIVA-VOCE: (100 marks)**

**Aims:** To elicit candidate's overall knowledge of the subject and investigative / therapeutic skills.

**a) Oral / Viva-voce examination –**

Students will be examined by all the PG examiners together about students' comprehension, analytical approach, expression and interpretation of data and understanding of the subject.

**SCHEME OF EXAMINATION**

<b>Max. Marks in M.D. Community Medicine</b>	<b>Theory</b>	<b>Practical including PG Dissertation</b>	<b>Viva-voce</b>	<b>Grand Total</b>
	400	300	100	800

Obtaining a **minimum of 40% marks in each theory paper** and **not less than 50% cumulatively in all the four papers** for degree examination shall be mandatory. Obtaining of **minimum of 50% marks in Practical examination** shall be mandatory for passing the examination as a whole in the degree examination. Hence a **candidate shall secure not less than 50% marks in each head of examination which shall include Theory and Practical including clinical and viva voce examination. No grace mark is permitted** in Postgraduate Examination either for **Theory or for Practical**. The university shall conduct not more than two examinations in a year with an interval of not less than four months and not more than eight months between the two examinations.

**RECOMMENDED BOOKS (LATEST EDITIONS):**

<b>Sl. No.</b>	<b>Name of the Textbook</b>	<b>Authors</b>	<b>Publisher</b>
1.	Maxcy-Rosenau Public Health and Preventive Medicine	Maxcy Rosenau John. M. Last	Appleton-Century-Crofts,
2.	The Theory and Practice of Public Health	Hobson W	Oxford Med. Publication
3.	Epidemiology in Medical Practice	Barker D.J. P	Churchill Livingstone.
4.	Text Book of P & S M	Park. J. E. & K . Park.	M/s. Banarasidas Bhanot
5.	Text Book of P & S M	Mahajan. B. K and M.C. Gupta	Jaypee Publications.
6.	Principles of Medical Statistics	Bradford Hill	The Lancet Ltd.
7.	Public Health Administration and Practice	John J. Hanlon	Mosby.
8.	Epidemiology	MacMahon & Pugh	Little Brown & Co.
9.	Modern Nutrition in Health	Robert S. Goodheart, Mulice E. Shills	K M Varghese & Co.
10.	Epidemiology: An Introductory Text	Mawner & Kramer	W B Saunders Co.
11.	Hunter's Diseases of Occupations	P.A.B. Raffle, P.H. Adams, P.J. Baxter and W.R. Lee	Edward Arnold Publishers, Great Britain.
12.	National Health Programmes of India	J. Kishore	Century Publication New Delhi
13.	Text Book of Community Medicine	Sunderlal, Adarsh, Pankaj,	CBS Publishers, Darya Ganj, New Delhi: 110 002.
14.	Medical Ethics	Francis C.M	J.P. Publications, Bangalore
15.	Essentials of Medical Statistics	Kirkwood B.R	Oxford; Blackwell Scientific Publications.

16.	Methods in Bio statistics for medical students	Mahajan B.K	Jaypee Brothers Medical Publishers New Delhi,
17.	Occupational Medicine	Carl Zenz	Mosby, USA.
18.	Epidemiology and Management for Health Care for all	Sathe P. V. Sathe A. P.	Popular Prakashan Pvt. Ltd. Mumbai
19.	Principles of Community Medicine	Sridhar Rao. B.	AITBS publishers and Distributors New Delhi
20.	Community Medicine with Recent advances	Suryakantha	Jaypee Brothers

### RECOMMENDED JOURNALS:

Sl. No.	Name of the Journal
1.	Indian Journal of Community Medicine
2.	Indian Journal of Public Health
3.	Indian Journal of Community Health
4.	Journal of Communicable Diseases
5.	Indian Journal of Maternal & Child Health
6.	Indian Journal of Occupational Health & Environmental Medicine
7.	Indian Journal of Medical Research
8.	Indian Journal of Malariology
9.	Indian Journal of Environmental Health
10.	Indian Journal of Medical Education
11.	Journal of Indian Medical Association
12.	Journals of Medicine, Pediatrics, OBG, Skin & STD, Leprosy, Tuberculosis & Chest Diseases (for reference)0
13.	Indian Journal of Social Work
14.	Journal of Environmental Science and Engineering
<b>International Journals</b>	
1.	WHO Publications
2.	Journal of Epidemiology & Community Health.
3.	Tropical Diseases Bulletin
4.	Vaccine
5.	American Journal of Public Health
6.	Lancet

7.	New England Journal of Medicine
8.	American Journal of Epidemiology
9.	Health Promotion and Education in South East Asia
10.	W.H.O. Technical Report Series
11.	Pan American Journal of Public Health
<b>E – Journals</b>	
1.	American Journal of Public Health
2.	Applied Health Economics & Health Policy
3.	Epidemiology
4.	International Journal of Epidemiology
5.	Journal of Acquired Immune Deficiency Syndromes & Human Retrovirology
6.	Journal of Epidemiology & Community Health
7.	Journal of Medical Ethics
8.	Journal of Occupational & Environmental Medicine
9.	Health Care Management Review
10.	Quality in Health Care

## **COMMITTEE REPORTS AND POLICY DOCUMENTS – MEDICAL EDUCATION AND HEALTH POLICY**

1. **Bhore Committee Report (1946)** Health Survey and Development Committee, Govt. of India, Delhi
2. **Mudaliar Committee Report (1961)** Health Survey and Planning Committee, Govt of India, Delhi
3. **Shrivastav Report (1974)**, Health Services and Medical Education – A Programme for immediate action, Group on Medical Education and Support Manpower, Ministry of Health and Family Welfare, Govt. of India, New Delhi
4. ICSSR/ICMR (1981), **Health for All – An alternative strategy – Report of a Joint study group of ICSSR/ICMR**, Indian Institute of Education, Pune
5. **National Health Policy**, (2001) Ministry of Health and Family Welfare, Government of India, New Delhi
6. Compendium of Recommendations of various committees on Health and

Development (1943 – 1975), Central Bureau of Health Intelligence (1985)  
Directorate General of Health services, Ministry Family Planning, New Delhi

7. Bajaj, J.S. et al. (1990) Draft **National Education Policy for Health Sciences**, I.J.M.E. Vol. 1 & 2 (Jan – August 1990)
8. National Health Policy, Ministry of Health & Family Welfare, Govt of India, Nirman Bhawan, New Delhi 1983, 2002 & 2017
9. Indian Council of Medical Research, “Policy Statement of Ethical considerations involved in Research on Human Subjects”, I.C.M.R, New Delhi.
10. ‘Code of Medical Ethics’ framed under section 33 of the Indian Medical Council Act, Medical Council of India, Kotla Road, New Delhi. 2002
11. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi.
12. International Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted biomedical Journals, New England J. Med (latest)

#### **ADDITIONAL READING (LATEST EDITION):**

1. Compendium of recommendations of various committees on Health and Development (1943 – 1975). DGHS, 1985 Central Bureau of Health Intelligence, Directorate General of Health Services, Ministry of Health and Family Welfare, Govt. of India, Nirman Bhavan, New Delhi. P – 335.
2. National Health Policy 1983, 2002 & 2017, Min. of Health & Family Welfare, Nirman Bhawan, New Delhi.
3. Santosh Kumar, The elements of Research, writing and editing Dept. of Urology, JIPMER, Pondicherry
4. Srinivasa D.K et al, Medical Education Principles and Practice, National Teacher Training Centre, JIPMER, Pondicherry
5. Indian Council of Medical Research, “Policy Statement of Ethical considerations involved in Research on Human Subjects”, I.C.M.R, New Delhi.

6. Code of Medical Ethics framed under section 33 of the Indian Medical Council Act, 1956. Medical Council of India, Kotla Road, New Delhi. 2002
7. Francis C.M, Medical Ethics, J.P. Publications, Bangalore.
8. Indian National Science Academy, Guidelines for care and use of animals in Scientific Research, New Delhi.
9. Internal National Committee of Medical Journal Editors, Uniform requirements for manuscripts submitted biomedical Journals, New England J. Med 1991: 424-8
10. Kirkwood B.R, Essentials of Medical Statistics, Oxford; Blackwell Scientific Publications.
11. Mahajan B.K, Methods in Biostatistics for medical students, New Delhi, Jaypee Brothers Medical Publishers.
12. Raveendran B & Gitanjali, A Practical approach to PG dissertation, New Delhi, J.P. Publications.
13. National Ethical Guidelines for Biomedical & Health Research involving human participants, ICMR, 2017 & 2020
14. WHO Standards and Operational guidance for ethics review of health related research with human participants, 2011
15. WHO Guidance on Ethical conduct of controlled human infection studies, 2021
16. CIOMS, International Ethical guidelines for epidemiological studies, 2009

#### **OCCUPATIONAL HEALTH (LATEST EDITION)**

1. Hunter's Diseases of Occupations, Edited by P.A.B Raffle, P.H.Adams, P.J. Baxter and W.R. Lee Edward Arnold Publishers, Great Britain
2. Schilling, Occupational Health Practice, Butterworth & Company, Great Britain.
3. Carl Zenz, Occupational Medicine, Mosby, USA.

4. WHO Geneva, Early detection of Occupational Diseases
5. ILO Publications Geneva, Encyclopedia of Occupational Health & Safety, Vol. 1&2.
6. Plunkett (E.R), Occupational Diseases, Barret Book Company, Stanford.
7. Johnstone (R.T), Occupational Diseases and Industrial Medicine, Saunders, Philadelphia.

#### **OTHER TEXTBOOKS (LATEST EDITIONS)**

1. Weinsieir. R.L. Fundamentals of Clinical Nutrition
2. Detels R. & Holland W.W. Oxford Textbook of Public Health, Vol. I, II & III
3. Sathe P.V. & Sathe A.P. Epidemiology and Management for Health Care for all
4. Williams S.R. Essentials of Nutrition and Diet Therapy
5. Kishore Jugal, National Health Programmes of India,
6. WHO, A Practical Guide for Health Researchers, Fathalla & Fathalla, WHO EMRO, 2004.
7. WHO A guide for training in Research Methods – WHO, ROWP, 2<sup>nd</sup> Ed, 2001
8. Mandell G.L. & Bennett J.E., Principles & Practice of Infectious Diseases. Vol. I & II
9. Public Health and Preventive Medicine (Maxcy-Rosenau-Last Public Health and Preventive Medicine) by Robert B. Wallace
10. Basic Epidemiology. R. Bonita, R Beaglehole, T Kjellstrom. World Health Organization Geneva.
11. *Epidemiology*, by Leon Gordis. (latest edition)
12. *Oxford Textbook of Public Health*. Holland W, Detel R, Know G.
13. *Practical Epidemiology*, by D.J.P Barker
14. *Park's Textbook of Preventive and Social Medicine*, by K.Park (latest edn)
15. *Principles of Medical Statistics*, by A. Bradford Hill
16. *Interpretation and Uses of Medical Statistics*, by Leslie E Daly, Geoffrey J Bourke, James MCGilvray.
17. *Epidemiology, Principles and Methods*, by B. MacMahon, D. Trichopoulos



18. *Hunter's Diseases of Occupations*, by Donald Hunter, PAB Raffle, PH Adams, Peter J. Baxter, WR Lee.
19. *Epidemiology and Management for Health Care*, by Sathe PV and Doke PP.
20. *Vaccines*, by Stanley A. Plotkin
21. All reports and documents related to all National Health Programmes from the Ministry of Health and Family Welfare, Govt of India

**Annexure I**  
**Postgraduate Students**  
**Appraisal Form (Pre / Para**  
**clinical Disciplines**

**Name of the Department/Unit:**

**Name of the PG Student :**

**Period of Training : FROM.....TO.....**

Sr. No.	PARTICULARS	Not Satisfactory			Satisfactory			More Than Satisfactory			Remarks
		1	2	3	4	5	6	7	8	9	
1.	Journal based / recent advances learning										
2.	Patient based / Laboratory or Skill based learning										
3.	Self-directed learning and teaching										
4.	Departmental and interdepartmental learning activity										
5.	External and Outreach Activities / CMEs / Workshops / Trainings										
6.	Dissertation / Research work										
7.	Log Book / Daily Diary Maintenance										

**Publications**

**Yes/ No**

**Remarks\***

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**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual

**feedback to postgraduate student is strongly recommended.**

**SIGNATURE OF ASSESSEE**

**SIGNATURE OF FACULTY**

**SIGNATURE OF HOD**



# POSTGRADUATE TRAINING PROGRAMME FOR MS IN GENERAL SURGERY

## Preamble:

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

A post graduate in General Surgery having undergone the required training should be able to recognize the health needs of the community, should be competent to handle surgical problems and should be aware of the recent advances pertaining to this. The PG student should be competent to provide professional services with empathy and humane approach. The PG student should acquire the basic skills in teaching medical / para-medical students and is also expected to know the principles of research methodology and self-directed learning for continuous professional development.

## Goals:

- Practice surgery efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing surgical education irrespective of whether he is in a teaching institution or is a practicing surgeon.
- Be a motivated 'teacher' defined as a surgeon keen to share his knowledge and skills with a colleague or junior or any learner.
- Practice Evidenced Based Medicine (EBM) in the field of General Surgery
- Plan and advice measures for the promotive, preventive, curative and rehabilitative

aspects of health and diseases in the specialty of General Surgery.

- Should be able to demonstrate his cognitive skills in the field of General Surgery and its ancillary branches during the formative and summative evaluation processes.

## GENERAL SURGERY LEARNING OBJECTIVES

### Clinical Objectives

At the end of postgraduate training, the PG student should be able to: -

1. Diagnose and appropriately manage common surgical ailments in a given situation.
2. Provide adequate preoperative, post-operative and follow-up care of surgical patients.
3. Identify situations calling for urgent or early surgical intervention and refer at optimum time to the appropriate subspecialty.
4. Counsel and guide patients and relatives regarding need, implications and problems of surgery in the individual patient.
5. Provide and coordinate emergency resuscitative measures in acute surgical situations including trauma.
6. Organize and conduct relief measures including triage in situations of mass disaster.
7. Effectively participate in the National Health Programs especially in the Family Welfare Programs.
8. Discharge medico-legal and ethical responsibilities effectively and practice them ethically.
9. Must learn to minimize medical errors.
10. Must update knowledge in recent advances and newer techniques in the management of the patients.
11. Must learn to counsel and obtain informed consent prior to performance of operative procedures.
12. Perform surgical audit on a regular basis and maintain records (manual and/or electronic) for life.
13. Participate regularly in departmental academic activities by presenting Seminars, Case discussions, Journal Clubs and Topic discussions on weekly basis and maintain logbook.

14. Demonstrate sufficient understanding of basic sciences related to General Surgery
15. Plan and advise measures for the prevention and rehabilitation of patients belonging to speciality.

### **Skills**

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the surgical condition.
- Perform minor operative procedures and common general surgical operations independently and the major procedures under the guidance of a senior surgeon.
- Provide basic and advanced life saving support services [BLS & ALS] in emergency situations.
- Manage acute abdominal emergencies and poly trauma.
- Undertake thorough wound management, including burns.
- Undertake complete patient monitoring including the preoperative and post-operative care of the patient.

### **HUMAN VALUES ETHICAL PRACTICE AND ABILITIES**

- Adopt ethical principles in all aspects of surgical practice. Professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of the team in a congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.



- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

### **Research:**

The student should:

1. Know the basic concepts of research methodology, plan a research project and knowhow to consult library and perform online literature search.
2. Should have basic knowledge of statistics.

### **Teaching:**

The student should learn the basic methodology of teaching and develop competence in teaching medical/paramedical students.

### **Professionalism:**

1. The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
2. The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
3. The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.

## **GENERAL SURGERY COMPETENCIES**

By the end of the course, the student should have acquired knowledge (cognitive domain), professionalism (affective domain) and skills (psychomotor domain) as given below:

### **A. Cognitive domain**

- Demonstrate knowledge of applied aspects of basic sciences like applied anatomy, physiology, biochemistry, pathology, microbiology and pharmacology.
- Demonstrate knowledge of the bedside procedures and latest diagnostics and therapeutics available.

- Describe aetiology, pathophysiology, principles of diagnosis and management of common surgical problems including emergencies, in adults and children.
- Demonstrate the theoretical knowledge of general principles of surgery.
- Demonstrate the theoretical knowledge of systemic surgery including disaster management and recent advances.
- Demonstrate the theoretical knowledge to choose, and interpret appropriate diagnostic and therapeutic imaging including ultrasound, Mammogram, CT scan & MRI.
- Demonstrate the knowledge of ethics, medico-legal aspects, communication skills and leadership skills. The PG student should be able to provide professional services with empathy and humane approach.

#### **B. Affective domain**

- Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, interact with the patients and the clinician or other colleagues to provide the best possible diagnosis or opinion.
- Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
- Develop communication skills to word reports, obtain a proper relevant history and professional opinion as well as to interact with patients, relatives, peers and paramedical staff and for effective teaching.
- Obtain informed consent for any examination/procedure and explain to the patient and attendants the disease and its prognosis with a humane approach.
- Provide appropriate care that is ethical, compassionate, responsive and cost-effective and in conformation with statutory rules.

#### **C. Psychomotor domain**

- Perform a humane and thorough clinical examination including internal examinations and examinations of all organs/systems in adults and children

- Write a complete case record with all necessary details.
- Arrive at a logical working diagnosis / differential diagnosis after clinical examination.
- Order appropriate investigations keeping in mind their relevance (need based).
- Choose, perform and interpret appropriate imaging in trauma - ultrasound FAST (Focused Abdominal Sonography in Trauma).
- Perform minor operative procedures and common general surgical operations independently and major procedures under guidance.
- Provide basic and advanced lifesaving support services in emergency situations.
- Provide required immediate treatment and comprehensive treatment taking the help of a specialist as required.
- Perform minimally invasive surgery in appropriate clinical settings. Must have undergone basic training in operative laparoscopy related to general and GI Surgery.
- Undertake complete patient monitoring including the preoperative and post- operative care of the patient.
- Write a proper discharge summary with all relevant information.
- Perform endotrainer exercises, intra-corporeal knotting and suturing.
- Perform lap appendectomy and cholecystectomy on simulator.

## Syllabus

### Course Contents:

She/he is expected to know the subject in depth, however, emphasis should be on the diseases/health problems most prevalent in that area. Knowledge of recent advances and basic sciences as applicable to his/her specialty should get high priority. Competence in surgical skills commensurate with the specialty (actual hands - on training) must be ensured.

#### 1. General topics:

A student should have fair knowledge of basic sciences (Anatomy, Physiology, Biochemistry, Microbiology, Pathology and Pharmacology) as applied to his specialty. Further, the student should acquire in-depth knowledge of his subject including recent advances and should be fully conversant with the bedside procedures (diagnostic and therapeutic) and have knowledge of latest diagnostics and therapeutics available.

1. History of Surgery with special reference to ancient Indian texts
2. Health economics - basic terms, health insurance
3. Medical sociology, doctor-patient relationship, family adjustments in disease, organizational behavior, conflict resolution
4. Computers - record keeping, computer aided learning, virtual reality, robotics
5. Hazards in hospital and protection: AIDS, Hepatitis B, tuberculosis, radiation, psychological
6. Environment protection - Bio-medical waste management
7. Surgical audit, evidence based surgical practice, quality assurance
8. Concept of essential drugs and rational use of drugs
9. Procurement of stores and material & personnel management
10. Research methodology - library consultation, formulating research, selection of topic, writing thesis protocol, preparation of consent form from patients
11. Bio-medical statistics, clinical trials

12. Medical ethics
13. Consumer protection
14. Newer antibiotics
15. Problem of resistance.
16. Sepsis - SIRS
17. Nosocomial infection
18. Advances in imaging technologies
19. Disaster management, mass casualties, Triage
20. O.T. design, technologies, equipment
21. Critical care in surgical practice
22. Response to trauma
23. Wound healing
24. Fluid and electrolyte balance
25. Nutrition
26. Blood transfusion
27. Brain death
28. Cadaveric organ retrieval
29. Practice of surgery during pandemic (COVID)

#### 1. **Systemic Surgery**

The student must acquire knowledge in the following important topics but teaching should not be limited to these topics. A standard text-book may be followed which will ~~also identify the level of learning expected of the trainees-~~ help the student to achieve the expected level.

- Wound healing including recent advances
- Asepsis, antisepsis, sterilization and universal precaution
- Surgical knots, sutures, drains, bandages and splints

- Surgical infections, causes of infections, prevention
- Common aerobic and anaerobic organisms and newer organisms causing infection including *Helicobacter Pylori*
- Tetanus, gas gangrene treatment & prevention
- Chronic specific infections TB, Filariasis
- Boils, cellulitis, abscess, necrotizing fascitis and synergistic infection
- Antibiotic therapy rationale including antibiotic prophylaxis, misuse, abuse
- Hospital acquired nosocomial infection causes and prevention including MRSA etc.
- HIV, AIDS and Hepatitis B & C, Universal precautions (PPE) when dealing with patients suffering from these diseases
- Fluid and electrolyte balance including acid - base disturbances, consequences, interpretation of blood gas analysis and data management
- Rhabdomyolysis and prevention of renal failure
- Shock (septicemic, hypovolemic, Neurogenic, anaphylactic), etiology, pathophysiology and management
- Blood and blood components, transfusion indication, contraindication, mismatch and prevention and management of complications of massive blood transfusion
- Common preoperative preparation (detailed preoperative workup, risk assessment according to the disease and general condition of the patient as per ASA grade) and detailed postoperative complications following major and minor surgical procedures
- Surgical aspects of diabetes mellitus particularly management of diabetic foot and gangrene, preoperative control of diabetes, consequences of hypo- and hyperglycemia in a postoperative setting
- Consequences and management of bites and stings including snake, dog & human Bites

- Mechanisms and management of blast and gunshot injuries
- Organ transplantation: Basic principles including cadaver donation, related Human Organ Transplant Acts, ethical and medicolegal aspects.
- Nutritional support to surgical patients
- Common skin and subcutaneous condition
- Sinus and fistulae, pressure sores
- Acute arterial occlusion, diagnosis and initiate management
- Types of gangrene, Burger's disease and atherosclerosis
- Investigations in case of arterial obstruction, amputation, vascular injuries: basic principles and management
- Venous disorders: Varicose veins
- Diagnosis, principles of therapy, prevention of DVT: basic principles and management
- Lymphatic: Diagnosis and principles of management of lymphangitis and lymphedema
- Surgical management of Filariasis
- Burns: causes, prevention and management
- Wounds of scalp and its management
- Recognition, diagnosis and monitoring of patients with head injury, Glasgow coma scale
- Undergo advanced trauma and cardiac support course (certified) before appearing for final examination
- Recognition of acute cerebral compression, indication for referrals.
- Cleft lip and palate
- **Basic principles of plastic surgery & reconstructive procedures**
- Leukoplakia, retention cysts, ulcers of tongue

- Oral malignancies
- Salivary gland neoplasms
- Branchial cyst, cystic hygroma
- Cervical lymphadenitis nonspecific and tuberculous, metastatic lymph nodes and lymphomas.
- Diagnosis and principles of management of goiter
- Thyroglossal cyst and fistula
- Thyrotoxicosis
- Thyroid neoplasms
- Management of solitary thyroid nodule
- **Parathyroid & adrenals**
- Thoracic outlet syndrome
- Management of nipple discharge
- Breast abscess
- Clinical breast examination, self-breast examination
- Screening and investigation of breast lump
- Concept of Single Stop Breast Clinic
- Breast Cancer diagnosis, staging and multimodality management (common neoadjuvant and adjuvant and palliative chemotherapy protocols and indications of radiation and hormonal therapy, pathology and interpretation of Tumor Markers, breast cancer support groups and counselling)
- Recognition and treatment of pneumothorax, hemothorax
- Pulmonary embolism: Index of suspicion, prevention/recognition and treatment
- Flail chest, stove in chest
- Postoperative pulmonary complication



- Empyema thoracis
- Recognition of oesophageal atresia and principles of management
- Neoplasms of the lung including its prevention by tobacco control
- Cancer oesophagus: principles of management including importance of early detection and timely referral to specialist
- Achalasia cardia
- Gastro-esophageal reflux disease (GERD)
- Congenital hypertrophic pyloric stenosis
- Aetiopathogenesis, diagnosis and management of peptic ulcer including role of H.Pylori and its diagnosis and eradication
- Cancer stomach
- Signs and tests of liver dysfunction
- Amoebic liver abscess and its non-operative management
- Hydatid cyst and its medical and surgical management including laparoscopic management
- Portal hypertension, index of suspicion, symptoms and signs of liver failure and timely referral to a speciality center
- Obstructive jaundice with emphasis on differentiating medical vs surgical Jaundice, algorithm of investigation, diagnosis and surgical treatment options
- Neoplasms of liver
- Rupture spleen
- Indications for splenectomy
- Clinical features, diagnosis, complications and principles of management of cholelithiasis and cholecystitis including laparoscopic cholecystectomy
- Management of bile duct stones including endoscopic, open and laparoscopic management

- Carcinoma gall bladder, incidental cancer gallbladder, index of suspicion and its staging and principles of management
- Choledochal cyst
- Acute pancreatitis both due to gallstones and alcohol
- Chronic pancreatitis
- Carcinoma pancreas
- Peritonitis: causes, recognition, diagnosis, complications and principles of management with knowledge of typhoid perforation, tuberculous peritonitis, postoperative peritonitis
- Abdominal pain types and causes with emphasis on diagnosing early intraabdominal acute pathology requiring surgical intervention
- Intestinal amoebiasis and other worms manifestation (Ascariasis) and their surgical complications (Intestinal Obstruction, perforation, gastrointestinal bleeding, involvement of biliary tract)
- Abdominal tuberculosis both peritoneal and intestinal
- Intestinal obstruction
- **Appendix:** Diagnosis and management of acute appendicitis
- Appendicular lump and abscess

## Colon

- Congenital disorders, Congenital megacolon
- Colitis infective / non infective
- Inflammatory bowel diseases
- Premalignant conditions of large bowel
- Ulcerative colitis
- Carcinoma colon
- Principles of management of types of colostomy

### **Rectum and Anal Canal:**

- Congenital disorders, Anorectal anomalies
- Prolapse of rectum
- Carcinoma rectum
- Anal Canal: surgical anatomy, features and management of fissures, fistula - in - ano.
- Perianal and ischiorectal abscess
- Haemorrhoids - Non-operative outpatient procedures for the control of bleeding (Banding, cryotherapy, injection) operative options - open and closed haemorrhoidectomy and stapled haemorrhoidectomy
- Anal carcinoma
- Clinical features, diagnosis, complication and principles of management of inguinal hernia including laparoscopic repair
- Umbilical, femoral hernia and epigastric hernia
- Open and Laparoscopic repair of incisional/primary ventral hernia
- Urinary symptoms and investigations of urinary tract
- Diagnosis and principles of management of urolithiasis
- Lower Urinary tract symptoms or prostatism
- **Renal cell carcinoma**
- Benign prostatic hyperplasia; diagnosis and management
- Genital tuberculosis in male
- Phimosis and paraphimosis
- Carcinoma penis
- Diagnosis and principles of treatment of undescended testis
- Torsion testis

- Hydrocele, haematocele pyocele & Varicocele: Diagnosis (Medical Board for fitness)
- Varicocele: Diagnosis (Medical Board for fitness)
- Acute and chronic epididymis-orchitis
- Testicular tumors
- Principles of management of urethral injuries
- Coronary artery diseases
- Valvular heart diseases
- **Peripheral nerve injuries**
- **Spinal injuries**
- Hydrocephalus
- Management of Head Injury
- Management of soft tissue sarcoma
- Prosthetic materials used in surgical practice
- Telemedicine, teleproctoring and e-learning
- Communication skills
- **Hernias, intestinal obstruction**
- **Spinal fusion defects**
- **Undescended testes**
- **Hypertrophic pyloric stenosis**
- **Diaphragmatic hernia**
- **Pediatric tumors**

A student should be expert in good history taking, physical examination, providing basic life support and advanced cardiac life support, common procedures like FNAC, Biopsy, aspiration from ~~serous~~ cavities, lumbar puncture etc. The student should be able to choose the required investigations.

**Clinical cases and Symptoms-based approach to the patient with:**

1. Ulcers in oral cavity
2. ~~Solitary nodule of the~~ thyroid diseases
3. Lymph nodes in the neck
4. Suspected breast lump
5. Benign breast disease
6. Acute abdominal pain
7. Blunt Trauma Abdomen
8. Gall stone disease
9. Dysphagia
10. Chronic abdominal pain
11. Epigastric mass
12. Right hypochondriac mass
13. Right iliac fossa mass
14. Renal mass
15. Inguino-scrotal swelling
16. Scrotal swelling
17. Gastric outlet obstruction
18. Upper gastrointestinal bleeding
19. Lower gastrointestinal bleeding
20. Anorectal symptoms
21. Acute intestinal obstruction
22. Obstructive jaundice
23. Acute retention of Urine

24. **Hernia**
25. Bladder outlet obstruction
26. Hematuria
27. Peripheral vascular disease
28. Varicose veins
29. New born with developmental anomalies
30. Hydronephrosis, Pyonephrosis, perinephric abscess
31. Renal tuberculosis
32. Renal tumors
33. Carcinoma prostate
34. Genital tuberculosis in male

**At the end of the course, post graduate students should be able to perform (including perioperative management) of the following procedures independently:**

- Start IV lines and monitor infusions
- Start and monitor blood transfusion
- Venous cut-down
- Secure central and arterial line
- Start and manage a C.V.P. line
- Conduct CPR (Cardiopulmonary resuscitation)
- Basic/ advance life support
- Endotracheal intubation
- Insert nasogastric tube
- Proctoscopy
- Urethral catheterisation
- Surgical management of wounds

- Biopsies including image guided
- Manage pneumothorax / pleural space collections
- Infiltration, surface and digital Nerve blocks
- Incise and drain superficial abscesses
- Control external hemorrhage
- Vasectomy (~~Preferably non-scalpel~~)
- Circumcision
- Surgery for hydrocele
- Surgery for various types of hernia
- Surgery and Injection banding of piles
- Management of all types of shock
- Assessment and management of burns
- Thyroid surgery
- Excision of thyroglossal cyst
- Excision Biopsy of Cervical Lymph node
- Excision of benign breast lump
- Modified Radical mastectomy
- Axillary Lymph node Biopsy
- Excision of gynecomastia
- Excision of skin and subcutaneous swellings
- Split thickness skin graft
- ~~Management of hernias~~
- Laparoscopic and open cholecystectomy
- Management of Liver abscess

- Appendectomy- Lap / Open
- Management of intestinal obstruction, small bowel resection, perforation and anastomosis
- Colostomy
- Suprapubic cystostomy

The student must have observed or assisted (the list is illustrative) in the following:

- Hartmann's procedure for cancer rectum
- Splenectomy (emergency)
- Stomach perforation
- Varicose Vein surgery
- Craniotomy (Head Injury)
- Superficial parotidectomy
- Submandibular gland excision
- Soft tissue tumours including sarcoma
- Pancreaticoduodenal resection
- Hydatid cyst liver
- Pancreatic surgery
- Retroperitoneal operations

## **LIST OF ESSENTIAL SURGICAL SKILLS**

These skills have been categorized into

- PI - Performed Independently
- PA - Performed with Assistance

The list also includes procedures which the student should have

- A- Assisted



- O- Observed

Procedure	Category
Insertion of intra venous lines, nasogastric tubes, urinary catheters etc.	PI
Minor suturing and removal of sutures	PI
Removal of tubes and drains	PI
Routine wound dressings	PI

Procedure	Category
Communication skills with patients, relatives, colleagues and paramedical staff	PI
Ordering of the requisite laboratory and radiological investigations and interpretation of the reports in light of the clinical picture	PI
Insertion of IV lines & Blood sampling, venous and Arterial	PI
Urinary bladder catheterization	
Universal precautions against communicable diseases	PI
Per rectal examination and Proctoscopy	PI
Abdominal paracentesis including diagnostic peritoneal Lavage	PI
Thoracocentesis	PI
Burns dressing	PI

Venesection	PI
FNAC	PI/PA/O
Ability to teach under graduates and interns	PI

Procedure	Category
Cardio pulmonary resuscitation	
Insertion of Central venous lines	PI
Management of airway & insertion of endotracheal tubes	PI
Insertion of peritoneal dialysis catheters	O/A
Intercostal chest drainage	PI
Suprapubic Puncture/Stab Cystostomy	PI
Tracheostomy	PI
Working knowledge of ventilators and various monitors	PI
Interpretation of arterial blood gases	PI

Correction of electrolyte disturbances	PI
Prescribing parenteral & enteral nutrition	PI

Metastatic work up: FNAC/True cut biopsy/imprint Cytology	O/A
Application of splints for fractures	PI
Assessment and initial management of Polytrauma	PI
Management of shock and cardiac/respiratory failure	PI
Recognition and initial management of surgical Emergencies	PI

Procedure	Category
Ability for adequate pre-operative preparation in special situations like diabetes, renal failure, cardiac and Respiratory failure etc. and risk stratification	PI
Communication skills with special reference to obtaining Informed Consent	PI
Proper pre-operative assessment and preparation of patients including DVT prophylaxis, Blood transfusion and antibiotics	PI

OT Procedures	Category
Instrument arrangement and trolley layout	PA
Skills in sterilization techniques, O.T. Layout and Asepsis	O
Skin preparation, painting and draping	PI
Techniques of scrubbing and gowning	PI
Airway management	PI
Skills for proper fluid & antibiotic management	PI
Management of epidural analgesia	PI
Management of postoperative hypo and hypertension, DVT	PI
Postoperative pain control & physiotherapy	PI
Skills for nutritional rehabilitation of patients	PI
Management of fistulae and stoma care	PI

#### Operation Theatre:

- Diathermy- principles and precautions
- Lasers - principles and precautions
- Explosion hazards in relation to general Anesthesia and Endoscopy
- Tourniquet - Uses, precautions

- Nerve injuries in anaesthetized patients
- Preoperative workup procedures and Postoperative procedures

<b>Procedure</b>	<b>Category</b>
Circumcision under local anesthesia	PI
Drainage of abscesses	PI
Major dressings	PI
Minor anorectal procedures like (hemorrhoids-banding, sclerotherapy, anal dilatation of fissure etc.	PI
Minor Biopsies-Lymph node, ulcer, swellings etc.,	PI
Reduction and plaster application of simple fractures and Dislocations	PA
Removal of simple subcutaneous swellings	PI
Sigmoidoscopy and Upper G.I.endoscopy	PA/A/O
Vasectomy	PI/PA
Wound debridement	PI

<b>Procedure</b>	<b>Category</b>
Cysts and sinuses of the neck	PA
Gynecomastia	PA
Drainage of breast abscess/Excision of breast lump	PI
Management of complex wounds	PI
Wide excision of breast tumors microdochectomy	PA
Mastectomy	PA/A
Parotidectomy	A
Thyroid lobectomy/Hemithyroidectomy	PA
Opening and closing the chest	PI
Opening and closing the abdomen	PI
Gastrostomy/feeding jejunostomy	PA
Cholecystectomy/laparoscopic cholecystectomy	
Release of bands and simple adhesive obstruction	PI
Closure of peptic ulcer perforation/under-running bleeding ulcer/ Vagotomy & drainage procedures	PI/PA
Colostomy	PA
Closure of Colostomy	PA
Laparotomy for abdominal trauma/splenectomy	PI/PA
Hemicolectomy	PA

Appendicectomy	PA/PI
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Laparotomy for intestinal obstruction/bowel resections/bowel anastomosis	PI
Hemorrhoidectomy/Fissurectomy/Simple fistulectomy	PI/PA
Herniotomy/Orchidopexy in children	PA
Groin Hernia repair	PI
Diagnostic laparoscopy	PA
Ventilation	PI
UGI endoscopy/Flexible sigmoidoscopy[diagnostic and therapeutic]	A/O/PA

Procedure	Category
Diagnostic and therapeutic Upper and Lower GI endoscopy	PA
Diagnostic laparoscopy	PA
Laparoscopic Cholecystectomy/Appendicectomy	A

## TEACHING AND LEARNING METHODS

### Teaching methodology

Didactic lectures are of least importance; small group discussion such as seminars, journal clubs, symposia, reviews and guest lectures should get priority for theoretical knowledge. Bedside teaching, grand rounds, structured interactive group discussions and clinical demonstrations should be the hallmark of clinical/practical learning with appropriate emphasis on e-learning. Student should have hands-on training in performing various procedures and ability to interpret various tests/investigations. Exposure to newer specialized diagnostic/therapeutic procedures concerning her/his subject should be given. Self-learning tools like assignments and case-based learning may be promoted.

A. **Theoretical Teaching:**

1. **Lectures:** Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated.
2. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter relevant details in the Log Book. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.
3. **Subject Seminar/Symposium:** Recommended to be alternate week. All the PG students are expected to attend and actively participate in discussion and enter relevant details in the Log Book. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator should be announced in advance.
4. **Case Discussion:** Recommended to be held twice a week. All the PG students are expected to attend and actively participate in discussion and enter relevant details in the Log Book. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the case presentation with names of the students should be announced in advance.
5. **Ward Rounds:** Ward rounds may be service or teaching rounds.
  - **Service Rounds:** Postgraduate students should do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.
  - **Teaching Rounds:** Every unit should have 'grand rounds' for teaching purpose at the bed side. A diary should be maintained for day-to-day activities by the post-graduate students.Entries ~~of (a) and (b)~~ should be made in the Log book.
6. **Clinico-Pathological Conference:** Recommended for all post graduate students. Presentation to be done by rotation. Presentations will be assessed

using checklist. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.

7. **Inter Departmental Meetings:** Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a month. These meetings should be attended by post-graduate students and relevant entries must be made in the Log Book.

~~**Pathology:** Interesting cases shall be chosen and presented by the post-graduate students and discussed by them as well as the senior staff of Pathology department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advanced immuno-histo-chemical techniques, the burgeoning markers, other recent developments can be discussed.~~

~~**Radio-diagnosis:** Interesting cases and the imaging modalities should be discussed. Emphasis should be given for the radiological differential diagnosis.~~

8. **Mortality / Morbidity Meetings:** The mortality meeting should be conducted in the department every month. The post graduate student should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting. The register to be maintained for the same.
9. **Teaching Skills:** Post-graduate students must teach under graduate students (eg. Medical, Nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by ~~medical~~ faculty ~~as well as by the students~~. Record of ~~their~~ the students participation is to be ~~kept made~~ in Log Book. Training of postgraduate students in Educational Science and Technology is recommended.
10. **Continuing Medical Education Programmes (CME):** Recommended that at least 1 state level CME programme should be attended by each student during the course.

**Conferences:** Attending conferences is compulsory. Post-graduate student should attend one national and one state level conference during the course.

**Research Activities:** A post graduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the post graduate degree examination.

11. **Basic practices for post graduates at the initiation of course:**
  - A. **Good clinical practice** - post graduates should develop good clinical practices which is essential for training for clinical research that involve human participants.
  - B. **BLS/ATLS** - post graduates should undergo BLS/ATLS course so they will be skillful to manage cases in emergencies.
  - C. **NPTEL**- all post graduates should undergo the BCBR course and clear NPTEL exams.
12. The Post-graduate students to be encouraged to carry out e-learning and research activities in the department other than dissertation work.
13. **Training in Research Methodology (Practice based learning, Evidence based practice)**

**A) Clinical / Practical Training:**

**SKILLS LAB SESSIONS:** to be conducted once a fortnight for all three years

**I<sup>st</sup> Year**

Suturing & Knotting

Trauma care

BLS (Basic Life Support) Course and ATLS Course

**II<sup>nd</sup> Year**

Laparoscopy & Endo-trainer

**III<sup>rd</sup> Year**

Cadaveric Skill Lab

OSCE - once in six months



### 1. Clinical postings

A major portion of posting should be in General Surgery. It should include inpatients, out-patients, ICU, trauma, emergency room and speciality clinics.

#### Rotation of posting

- Inter-unit rotation in the department should be done for a period of up to one year.
- Rotation in appropriate related subspecialties for a total period not exceeding 06 months.
- **Other Surgical Subjects.**  
Postings to other specialty departments, the department and duration of postings are as under

Sl. No	Department	Duration
1	Paediatric Surgery	1. Month
2	Plastic Surgery	1. Month
3	Neurosurgery	1. Month
4	Urology	1. Month
5	CVTs	1. Month
6	Oncology-Surgery	1. Month
7	DRP (District Residence Programme.)	2. Months
8	Surgical Gastroenterology	1. Month

### 2. Clinical meetings:

There should be intra- and inter- departmental meetings for discussing the uncommon /interesting cases involving multiple departments viz- Pathology, Radiology.

### 3. Log book:

Each student must be asked to present a specified number of cases for clinical

discussion, perform procedures/tests/operations/present seminars/review articles from various journals in inter-unit/interdepartmental teaching sessions. They should be entered in a Log Book. The Log books shall be checked and assessed periodically by the faculty members imparting the training.

**4. Dissertation:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners: one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate students shall be allowed to appear for the Theory and Practical / Clinical examination only after the acceptance of the Thesis by the examiners.

**~~5. Thesis writing and research:~~**

~~Thesis writing is compulsory.~~

6. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
7. ~~A postgraduate student of a postgraduate degree course in broad specialities/ super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.~~
8. The student should know the basic concepts of research methodology, plan a research project, be able to retrieve information from the library. The student should have a basic knowledge of statistics.

9. Department should encourage e-learning activities.

During the training program, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models (skill lab & cadaver lab), later to be performed under supervision followed by performing independently. ~~for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.~~

## **Eligibility Criterion**

**Revised Eligibility requirements for PG Students in Broad Specialty and Super Specialty for appearing in university examination.**

- Have minimum one Poster presentation or Podium presentation at a National / Zonal/ State Conference of his/ her specialty
- Have minimum one Research paper published in journal of his / her specialty as first author.
- Complete an online course in Research Methodology **NPTEL** in the first year and submit the certificate generated on successful completion of the course and examination.
- Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institutions.
- Complete a certification course in Basic Cardiac Life Support (**BCLS**) and Advanced Cardiac Life Support (**ACLS**) skills in the first year of the course conducted by the institution.
- Thesis acceptance by all evaluators before the conduct the University Examination.

## ASSESSMENT

Assessment should be comprehensive & objective. It should address the stated competencies of the course. The assessment needs to be spread over the duration of the course.

**FORMATIVE ASSESSMENT**, i.e., assessment during the training would include:

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system. **Formative assessment will be conducted for theory as well as practical. OSCE/OSPE will be used for both formative as well as summative assessment**

During the course of three years, the department will conduct three tests. Two of them will be annual, one at the end of first year and other at the end of second year. The third test will be a preliminary examination which may be held three months before the final examination. The test may include the written papers, practical/clinical and viva-voce. Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the university when called for. The results of the internal evaluation of PG students should be informed to them

### General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

**Weekly/monthly assessment during the MS training should be based on following educational activities:**

1. Journal Club / recent advances learning
2. Patient based/ Case Presentation /Laboratory or Skill based learning
3. Seminar/ Symposium/ Self-directed learning and teaching
4. Departmental and interdepartmental learning activity viz Radiology, Pathology /Mortality Meeting.
5. External and Outreach Activities / CMEs

The student to be assessed periodically as per categories listed in postgraduate student appraisal form **(Annexure I)**.

**SUMMATIVE ASSESSMENT**, i.e., assessment at the end of training

The summative examination would be carried out as per the Rules given in

**POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2000.**

**SCHEME OF EXAMINATION: (Final Summative Assessment)**

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

**A. Theory: 400 Marks**

There shall be four papers, each of three hours duration. Total marks of each paper will be 100. ~~Questions on recent advances may be asked in any or all the papers.~~

~~The examination will be in three parts:~~

**1. Thesis**

~~Every post graduate student shall carry out work on an assigned research project under the guidance of a recognised Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.~~

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A candidate shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

**2. Theory**

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period. At the end of every academic year internal examination shall be conducted.

Theory shall consist of four papers of 3 hours each. **Total marks of each paper will be 100**

**Paper I: Basic Sciences**

**Paper II: Principles and Practice of Surgery**

**Paper III: Principles and practice of Operative Surgery**

**Paper IV: Recent Advances in Surgery**

**Note:** The distribution of chapters / Topics shown against the papers are suggestive only and may overlap ~~or change.~~

**The format of each paper will be same as shown below**

Type of Questions	No. of questions	Marks for each question	Total marks
Long Essay	10	10	100

During the course of three years, the department will conduct three tests. Two of them will be annual, one at the end of first year and other at the end of second year. The third test will be a preliminary examination which may be held three months before the final examination. The test may include the written papers, practical/clinical and viva-voce. Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the university when called for.

Results of all evaluations should be entered in to PG's diary and departmental file for documentation purposes. Main purpose of periodic examination and assessment is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

### **3. Clinical / Practical and viva voce Examination**

Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/Teacher, for which post graduate students shall examine a minimum of one long case and two short cases.

The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the, which form a part of the examination.

Assessment will include **Objective structured clinical/practical examination.**



**(OSCE/OSPE)**

Oral/Viva-voce examination needs to assess knowledge on X-rays, instruments and operative procedures. Due weightage should be given to Log Book Records and day-to-day observation during the training.

**EVALUATION OF M.S. COURSES**

Description	M.S	
<b>THEORY</b>		
• No of Theory papers	04	
• Marks for each Theory paper	100	
Total marks for Theory papers	400	
Passing minimum for Theory	200/400(40% minimum in each paper)	
<b>PRACTICALS</b>	300	
• Dissertation	20	
• OSCE/OSPE	30 (5 Stations X 6 Marks)	
• Long Case	100	
• Short Cases	2 x 50 = 100	
• Subject specific assessment	50	Logbook 10 Marks Ward Rounds 20 x 2 cases = 40
<b>VIVA</b>	<b>100 (4 examiners)</b> <ul style="list-style-type: none"><li>• Operative surgery -25</li><li>• Surgical Instruments-25</li><li>• Surgical Specimens-25</li><li>• Radiology and Imaging -25</li></ul>	

~~**A. Clinical/ Practical Examination: 300 Marks**~~

~~To elicit competence in clinical skills and to discuss differential diagnosis and therapeutic aspects.~~

~~**Type of Cases**~~

~~**No of Cases**~~

~~**Marks**~~

~~**s**~~

Long Case	4	100
Short Cases	2 (50 marks each)	100
Ward Rounds	2 (25 marks each)	50
Spotter	5 (10 marks each)	50
<b>Total</b>	<b>10</b>	<b>300</b>

### **~~B. Viva-Voce Examination: 100 Marks~~**

**~~Aims:~~** To elicit candidate's knowledge and investigative/ therapeutic skills

**~~1] Viva voce Examination [80 Marks]~~**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be given case reports, charts, gross specimens, ~~histopathology slides~~, X ray, ultrasound, CT scan images, etc. for interpretation. Questions on operative surgery will be asked. Student's knowledge on the use of instruments and drugs pertaining to the subject will also be evaluated during viva - voce examination.

### **~~2) Pedagogy Exercise and Log Book - [20 marks]~~**

- ~~i) Candidate is asked to make a presentation for 8 to 10 minutes on a topic given in the beginning of clinical examination 10 Marks~~**
- ~~ii) Candidate is asked to make a presentation for 8 to 10 minutes on the dissertation topic and the review of Log Book. 10 Marks~~**

**Log book 10 marks**

Candidates is asked to make a presentation for 8-10 minutes on the & work carried out during the period of training. The candidate is expected to submit the log books to the examiners for verification.

## M.S. General Surgery Practical / Clinical Examination

**Max Marks: 400**

PRACTICALS									VIVA VOCE				
Long Case	Short Case I	Short Case II	Subject Specific Assessment			Dissertation	OSCE / OSPE	Total	Surgical Instruments	Surgical Specimen	Operative Surgery	Radiology and Imaging	Grand Total
			Ward Round I	Ward Round II	Logbook								
100	50	50	20	20	10	20	30	300	25	25	25	25	100

### C. Maximum Marks:

Maximum marks for M.S.in General Surgery	Theory	Practical	Viva	Grand total
	400	300	100	800

### Recommended Reading:

#### Books (latest edition)

1. Text Book of Surgery, by Christopher Davis
2. ASI Text Book of Surgery
3. Surgery of Colon, Rectum and Anal canal, by Goligher J C
4. Schwartz Text Book of Surgery
5. Textbook on Laparoscopic Surgery
6. ~~Trauma (Mattox)~~
7. Recent Advances in Surgery
8. Year Book of Surgery
9. Surgical Clinics of North America
10. Short practice of Surgery by Bailey and Love

11. A manual of clinical Surgery, by S Das
12. Hamilton Bailey's demonstration of clinical signs
13. Pye's Surgical Handicraft
14. Farquharson's Text Book of General Surgery
15. Current Surgical Diagnosis & Treatment 16.
- Emergency Surgery by Baily H
17. Dudley's Atlas of General Surgery
18. Mastery of Surgery by Baker R.J Vol. I & II
19. Sabiston Text Book of Surgery, Part I & II
20. Maingot's Abdominal Operations
21. Oxford Text Book of Surgery Vol. I, II & III by Morris and Wood
22. S. Das Text Book on Surgical Short Cases
23. Mastery of Thoracic Surgery
24. Text Book of Hepatobiliary Surgery-Blumgart
25. Zollinger Atlas of Surgical Operation
26. Surgery of Alimentary Tract Vol 1 & 2 Shackelford

**Journals:** All Indexed journals

1. Annals of Surgery
2. Archives of Surgery
3. British Journal of Surgery

4. Journal of Neurosurgery
5. Journal of Plastic, Reconstructive and Aesthetic Surgery
6. Journal of Trauma
7. Journal of Urology
8. Surgical Clinics of North America
9. Indian Journal of Surgery
10. Journal of Minimal Access Surgery
11. Indian Journal of Thoracic and Cardio vascular Surgery
12. Journal of Emergency Trauma and Shock.

[Attached Postgraduate Log-Book](#)

### **SUMMARY SHEET.**

Board of Studies for : Postgraduate Examination M.S. General Surgery.

Changes in the Curriculum for the year: 2023-24

Name of the Chairperson of BOS : Prof. Dr. Shrishal C Metgud.

External members of BOS : Dr. Mahan Desai, KEM Hospital Bombay

In-house Members of BOS : Dr. Ravi.S. Jatti Professor & HOD, Dept of Orthopedics

Dr. B.M. Kajagar. Professor of Surgery.

Dr. Amit Ammanagi Assistant Professor.

Meeting Date: 8/5/2024

Sl.	Existing Reform	Changed Reform	Basis for the Change	Remarks
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No				
1	Eligibility criteria for Practical & Viva-Voce Exam mentioned were not defined clearly	Added – Revised Eligibility requirements for PG Students in Broad Sociality for appearing in university examination.	As per The Gazette of Indian dated 01/01/2024 and NMC Notification New Delhi dated 29/12/2023	-----
2	Dissertation marks and theory practical viva voce marks was disproportionate	Rectification and distribution of marks of theory and practical and viva voce as per NMC Notification	As per The Gazette of India dated 01/01/2024 and NMC Notification New Delhi dated 29/12/2023	-----
3	Introduction of OSCE/OPSE for Summative examination	-	-	-----

**POST GRADUATE DEGREE COURSE  
M.S. IN ORTHOPAEDICS**

**PREAMBLE:**

The purpose of PG education is to create specialist who would provide high quality health care and advance the cause of science through research and training.

A postgraduate undergoing training MS in Orthopaedics should be trained to identify and recognize various congenital, developmental, inflammatory, infective, traumatic, metabolic, neuromuscular, degenerative and oncologic disorders of the musculoskeletal systems. She/he should be able to provide competent professional services to trauma and Orthopaedic patients at a primary/ secondary/tertiary healthcare centers.

The purpose of MS Orthopaedic is to standardize Orthopedic, Traumatology & Emergency Medicine teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in postgraduate teaching as well as resultantly creating competent Orthopaedic surgeons with adequate expertise.

**1) GOALS:**

A candidate upon successfully qualifying in the M.S. (Orthopaedics) examinations should:

1. Identify the diseases and injuries of musculo-skeletal system and obtain proper history and perform thorough clinical examination.
2. Plan / Interpret investigations, Institute the management in diseases and injuries of musculo-skeletal system.
3. Acquire scientific temper for teaching and research in the discipline/subject
4. Acquire skills to manage Orthopaedic services.
5. Organise rehabilitative services to the physically handicapped persons.

**2) SUBJECT SPECIFIC LEARNING OBJECTIVES:**

This will be dealt with under the following headings:

1. Theoretical knowledge (Cognitive domain)
2. Practical and clinical skills (psychomotor domain)
3. Attitudes including communication skills (Affective domain)
4. Writing thesis / Reviewing Research activities (Scholarly activity)



5. Training in Research Methodology (Practice based learning, Evidence based practice)
6. Professionalism
7. Teaching skills

### 3) SUBJECT SPECIFIC COMPETENCIES:

#### A. Cognitive domain: Knowledge

At the end of the M.S. Orthopaedics programme, the post graduate student should be able to:

1. Demonstrate sufficient understanding of the basic sciences relevant to Orthopaedic speciality through a problem based approach.
2. Describe the Principles of injury, its mechanism and mode, its clinical presentation, plan and interpret the appropriate investigations, and institute the management of musculoskeletally injured patient.
3. Identify and describe the surface anatomy and relationships within of the various bones, joints, ligaments, major arteries, veins and nerves of the musculoskeletal system of the spine, upper limb, lower limb and the pelvis, chest, abdomen and head & neck.
4. Define and describe the pathophysiology of shock (circulatory failure).
6. Define and describe the pathophysiology of Respiratory failure
7. Describe the principles and stages of bone and soft tissue healing
7. Understand and describe the metabolic, nutritional, endocrine, social impacts of trauma and critical illness.
8. Enumerate, classify and describe the various bony/soft tissue injuries affecting the axial and appendicular skeletal system in adults and children.
9. Describe the principles of internal and external fixation for stabilization of bone and joint injuries.
10. Describe the mechanism of homeostasis, fibrinolysis and methods to control hemorrhage
11. Describe the physiological coagulation cascade and its abnormalities
12. Describe the pharmacokinetics and dynamics of drug metabolism and excretion of analgesics, anti inflammatory, antibiotics, disease modifying agents and chemotherapeutic agents.
13. Understanding of biostatistics and research methodology
14. Describe the clinical presentation, plan and interpret investigations, institute management and prevention of the following disease conditions
  - a. Nutritional deficiency diseases affecting the bones and joints
  - b. Deposition arthropathies

- c. Endocrine abnormalities of the musculoskeletal system
  - d. Metabolic abnormalities of the musculoskeletal system
  - e. Congenital anomalies of the musculoskeletal system
  - f. Developmental skeletal disorder of the musculoskeletal system
15. Describe the pathogenesis, clinical features plan and interpret investigations and institute the management in adults and children in
- a. Tubercular infections of bone and joints (musculoskeletal system)
  - b. Pyogenic infections of musculoskeletal system
  - c. Mycotic infections of musculoskeletal system
  - d. Autoimmune disorders of the musculoskeletal system
  - e. Rheumatoid arthropathy, Ankylosing spondylitis, seronegative arthropathy
  - f. Osteoarthritis and spondylosis
16. Describe the pathogenesis, clinical presentation, plan and interpret investigations and institute appropriate treatment in the following conditions:
- a. Post polio residual paralysis
  - b. Cerebral palsy
  - c. Muscular dystrophies and myopathies
  - d. Nerve Injuries
  - e. Entrapment neuropathies
17. Identify the diagnosis and describe management of musculoskeletal manifestation of AIDS and HIV infection
18. Describe the aetiopathogenesis, identify, plan and interpret investigation and institute the management of osteonecrosis of bones.
19. Identify situations requiring rehabilitation services and prescribe suitable orthotic and prosthetic appliances and act as a member of the team providing rehabilitation care
20. Identify a problem, prepare a research protocol, conduct a study, record observations, analyse data, interpret the results, discuss and disseminate the findings.
21. Identify and manage emergency situation in disorders of musculoskeletal system
22. Understanding of the basics of diagnostic imaging in orthopaedics like:
- a. Plain x-ray
  - b. Ultrasonography
  - c. Computerised axial tomography
  - d. Magnetic resonance imaging
  - e. PET scan
  - f. Radio Isotope bone scan
  - g. Digital Subtraction Angiography (DSA)
  - h. Dual energy x-ray Absorptiometry
  - i. Arthrography

23. Describe the aetiopathogenesis, clinical presentation, Identification, Plan investigation and institute treatment for oncologic problems of musculoskeletal system both benign and malignancies, primary and secondary.
24. Understand the basics, principles of biomaterials and orthopaedic metallurgy
25. Describe the principles of normal and abnormal gait and understand the biomedical principles of posture and replacement surgeries.
26. Describe social, economic, environmental, biological and emotional determinants of health in a given patient with a musculoskeletal problem.

## **B. Psychomotor domain: Surgical Skills**

**1. At the end of the first year of M.S. Orthopaedics programme, the student should be able to:**

1. Elicit a clinical history from a patient, do a physical examination, document in a case record, order appropriate investigations and make a clinical diagnosis
2. Impart wound care where applicable
3. Apply all types of POP casts/slabs, splints and tractions as per need
4. Identify shock and provide resuscitation
5. Perform aspiration of joints and local infiltration of appropriate drugs
6. Perform appropriate wound debridement
7. Perform arthrotomy of knee joint
8. Perform incision and drainage of abscess
9. Perform split thickness skin grafting
10. Perform fasciotomes
11. Apply external fixators
12. Apply skeletal tractions including skull tongs
13. Triage a disaster situation and multiple trauma patients in an emergency room
14. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broad plating
15. Perform closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture.
16. Perform on a cadaver standard surgical approaches to the musculo skeletal system

**2. At the end of the second year of M.S. Orthopaedics course, the student should be able to:**

1. Take an informed consent for standard orthopaedic procedures
2. Perform closed/open biopsies for lesions of bone, joints and soft tissues
3. Perform split thickness skin grafting and local flaps
4. Perform on bone models, internal fixation with k-wires, screws, plates. Dynamic

hip/condylar screws/nailing.

5. Perform sequestrectomy and saucerisation
6. Perform arthrotomy of joints like hip/shoulder, ankle, elbow
7. Perform repair of open hand injuries including tendon repair
8. Perform arthodesis of small joints
9. Perform diagnostic arthroscopy on models and their patients
10. Perform carpal tunnel/tarsal tunnel release
11. Apply ilizarov external fixator
12. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities
13. Perform amputations at different levels
14. Perform corrective surgeries for CTEV, DDH, perthes/ skeletal dysplasia

**3. At the end of the third year of M.S. Orthopaedics programme, the student should be able to:**

1. Assist in the surgical management of polytrauma patient
2. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle
3. Assist in spinal decompressions and spinal stabilizations
4. Assist in operative arthroscopy of various joints
5. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow
6. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes
7. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement.
8. Assist in open reduction and internal fixations of complex fractures of acetabular, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand
9. Assist in spinal deformity corrections
10. Independently perform closed/open reduction and internal fixation with DCP, LCP, intramedullary nailing, LRS
11. Assist in limb lengthening procedures
12. Assist in Revision surgeries
13. Provide pre and post OP care
14. Perform all clinical skills as related to the speciality.

### **C. Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the

best possible diagnosis or opinion.

2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

## **Attitudes including Communication skills and Professionalism**

### **a. Communication skills:**

1. Exhibits participation in honest, accurate health related information sharing in a sensitive and suitable manner
2. Recognizes that being a good communicator is essential to practice effectively
3. Exhibits effective and sensitive listening skills
4. Recognises the importance and timing of breaking bad news and knows how to communicate
- 5 Exhibits participation in discussion of emotional issues
6. Exhibits leadership in handling complex and advanced communication
7. Recognizes the importance of patient confidentiality and the conflict between confidentiality and disclosure
8. Able to establish rapport in therapeutic bonding with patients, relatives and other stakeholders through appropriate communication
9. Able to obtain comprehensive and relevant history from patients/relatives
10. Able to counsel patients on their condition and needs

**b. Teamwork:** Seek cooperation. Coordination and communication among treating specialties and paramedical staff

**c. Counseling of relatives:** regarding patients condition, seriousness, bereavement and counseling for organ donation in case of brain stem death

d. **Leadership:** Trauma prevention, education of the public, paramedical and medical persons.

**Advocacy:** with the government and other agencies towards cause of trauma care

e. **Ethics:** The Code of Medical Ethics as proposed by Medical Council of India will be learnt and observed.

**SUBJECT SPECIFIC PRACTICE-BASED OR PRACTICAL COMPETENCIES**

Name/ Description of practice based competencies	Expected quantum
1. Taking a Clinical History from a patient with appropriate physical exam a. Hip-pain, Limp, Deformity, Instability, Both in child and adult b. Knee-pain, Deformity, Instability in child and adult c. Ankle, Foot d. Shoulder e. Elbow f. Wrist g. Head h. Spine	At least 3 clinical encounters in each region

<p><b>2. In the Bone Skills</b></p> <p><b><u>Lab Basic</u></b></p> <ol style="list-style-type: none"> <li>1. Introduction and tension band wiring</li> <li>2. Lag screw interfragmentary compression</li> <li>3. Broad plating</li> <li>4. Narrow plating</li> <li>5. Ex-Fix</li> <li>6. Cancellous screw fixation</li> <li>7. Umex</li> </ol> <p><b><u>Intermediary</u></b></p> <ol style="list-style-type: none"> <li>1. DHS</li> <li>2. DCS</li> <li>3. Tibia nailing</li> <li>4. Femur nailing</li> <li>5. Tibia condyle</li> <li>6. Elbow</li> <li>7. Ankle</li> </ol> <p><b><u>Advanced:</u></b></p> <ol style="list-style-type: none"> <li>1. Pelvis</li> <li>2. Pubic symphysis</li> <li>3. Acetabulum</li> <li>4. MIPPO</li> <li>5. Hemiarthroplasty</li> <li>6. Spine posterior</li> <li>7. Spine anterior</li> </ol>	<p>Practice at least twice on bone models and record</p>
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<p><b>3. On Patients</b></p> <p><b>i. At the end of the first year of M.S. Orthopaedics programme, the student will be able to perform:</b></p> <ul style="list-style-type: none"> <li>a. Wound care - different types of wound, and different chemotherapeutic agents for wound care, including VAC application</li> <li>b. POP casts/slabs, splints and tractions as per need. Learning of different types of bandaging.</li> <li>c. Identify shock and provide resuscitation</li> <li>d. Aspiration of joints and infiltration of appropriate drugs</li> <li>e. wound debridement</li> <li>f. Arthrotomy of knee joint and assist in arthrotomy of Hip, ankle, shoulder.</li> <li>g. Incision and drainage of abscess</li> <li>h. Split thickness skin grafting</li> <li>i. Fasciotomes</li> <li>j. External fixators</li> <li>k. Skeletal tractions including skull tongs</li> <li>l. Triage a disaster situation and multiple trauma patients in an emergency room</li> <li>m. Perform on bone models, interfragmentary compression screws, external fixation, Tension band wiring and Broadplating</li> <li>n. Closed reduction of common dislocations like shoulder and common fractures like collar fracture, supracondylar fracture.</li> <li>o. Perform on a cadaver standard surgical approaches to the musculo skeletal system.</li> </ul> <p><b>ii. At the end of the second year of M.S. Orthopaedics course, the student should be able to:</b></p> <ul style="list-style-type: none"> <li>a. Perform closed/open biopsies for lesions of bone, joints and soft tissues</li> <li>b. Perform split thickness skin grafting and local flaps</li> </ul>	<p>As per the clinical volume available in each institution</p>
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<ul style="list-style-type: none"> <li>c. Perform on bone models, internal fixation with k-wires, screws, plates. Dynamic hip/condylar screws/nailing.</li> <li>d. Perform sequestrectomy and saucerisation</li> <li>e. Perform arthrotomy of joints like hip/shoulder, ankle, elbow</li> <li>f. Perform repair of open hand injuries including tendon repair</li> <li>g. Perform arthodesis of small joints</li> <li>h. Perform diagnostic arthroscopy on models and their patients</li> <li>i. Perform carpal tunnel/tarsal tunnel release</li> <li>j. Apply ilizarov external fixator</li> <li>k. Perform soft tissue releases in contractures, tendon lengthening and correction of deformities</li> <li>l. Perform amputations at different levels</li> <li>m. Perform corrective surgeries for CTEV, DDH, perthes/skeletal dysplasia</li> <li>n. Perform cadaver based procedures, Arthroscopy, Arthrotomy.</li> </ul> <p><b>iii. At the end of the third year of M.S. Orthopaedics programme, the student should be able to:</b></p> <ul style="list-style-type: none"> <li>a. Assist in the surgical management of poly trauma patient</li> <li>b. Assist in Arthroplasty surgeries of hip, knee, shoulder and the ankle</li> <li>c. Assist in spinal decompressions and spinal stabilizations</li> <li>d. Assist in operative arthroscopy of various joints</li> <li>e. Assist /perform arthrodesis of major joints like hip, knee, shoulder, elbow</li> <li>f. Assist in corrective osteotomies around the hip, pelvis, knee, elbow, finger and toes</li> <li>g. Assist in surgical operations on benign and malignant musculoskeletal tumour including radical excision and custom prosthesis replacement.</li> <li>h. Assist in open reduction and internal fixations of complex</li> </ul>	<p>As per the clinical volume available in each institution</p>
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fractures of acetabulum, pelvis, IPSI lateral floating knee/elbow injuries, shoulder girdle and hand i. Assist in spinal deformity corrections	As per the clinical volume available in each institution
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j. Independently perform closed/open reduction and internal fixation with DCP, LCP, intra medullary nailing, LRS k. Assist in limb lengthening procedures l. Assist in Revision surgeries m. Provide pre and post OP care This care should be exercised from first year n. Perform all clinical skills as related to the speciality.	
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## ***SYLLABUS***

### **I. COGNITIVE DOMAIN**

At the end of the M.S. Orthopaedics programme, the post graduate student should be competent and show sufficient understanding of Basic Sciences as applicable to Orthopaedics and Trauma through a problem based approach.

#### **1. Basic Sciences as related to Orthopaedics and Trauma**

- a) Embryogenesis of all organ systems
- b) Structure and function of Central Nervous System
- c) Structure and function of the peripheral Nervous System
- d) Structure and function of the arterial and venous system
- e) Structure and functions of the head & neck, abdomen, thorax and extremities.

#### **2. Physiological basis and Pathophysiology in Health and Disease**

- a) Physical Growth
- b) Temperature regulation
- c) Acid Base Balance
- d) Fluid Balance
- e) Hematopoiesis
- f) Hemostasis
- g) Electrolyte balance
- h) Bone mineralization: Calcium-Phosphate balance
- i) Renal functions
- j) Hepatic function

- k) Respiratory functions
- l) Cardiac functions
- m) Gastrointestinal functions
- n) Endocrine functions
- o) Developmental Milestones
- p) Nutritional Needs of Orthopaedic/Trauma Patients
- q) Allergy

### **3. Clinical Microbiology as related to Orthopaedic infections**

- a) Virology
- b) Bacteriology
- c) Mycology
- d) Parasitology (Protozoology and Helminthology)
- e) Waste disposal, Sterilization, Disinfection

### **4. Clinical Pharmacology as related to Orthopaedics & Trauma**

- a) Pharmacokinetics - of common medications used in Orthopaedics & Trauma
- b) Antimicrobials
- c) Analgesia, Sedation
- d) Drug Interactions
- e) Adverse effects
- f) Antidotes for Poisons
- g) Drug induced disease

### **5. Professionalism and Ethics**

- a) Professionalism
- b) Ethics
- c) Medico legal essentials

### **6. Wound healing principles**

- a) Types of wounds
- b) Stages of wound healing
- c) Biochemical & Molecular factors in wound healing
- d) Chemotherapeutic and other Pharmaceuticals in wound care
- e) Host, Environment and agent factors

### **7. Bone Healing**

- a) Principles of bone healing
- b) Biological bone healing

- c) Factors influencing bone healing
- d) Biomechanism of bone healing

## **IV) COURSE CONTENTS: SYLLABUS**

### **A) BASIC SCIENCES: ANATOMY, PHYSIOLOGY, BIOCHEMISTRY, PATHOLOGY, MICROBIOLOGY, PHARMACOLOGY, MEDICOLEGAL ASPECTS AND BIOMECHANICS**

- 1) Anatomy : Embryology & Development of Musculoskeletal System, Histology.  
Anatomy of spine, shoulder girdle, chest, Abdomen, pelvic girdle, upper limb & lower limb.
- 2) Physiology : Physiology of Musculoskeletal system, Bone metabolism, Hormonal Control of Musculoskeletal system.
- 3) Bio Chemistry : Bio chemical aspects related to Orthopaedics.
- 4) Pathology : General pathology, Pathology related to Orthopaedics.
- 5) Biomechanics : Biomechanics of Trunk and Limbs.
- 6) Pharmacology : Anti inflammatory, Antibiotics, Anti malignant drugs and other related pharmacotherapeutic drugs.
- 7) Suture material
- 8) Metallurgy in Orthopaedics
- 9) Stem cells in Orthopedics
- 10) Gene therapy in Orthopedics
- 11) Orthobiologics
- 12) Robotics in Orthopaedics
- 13) 3D Printing
- 14) Artificial Intelligence in Orthopaedics

### **B) ORTHOPAEDIC TRAUMATOLOGY :**

At the end of the course the students should be able to describe basic concepts and mechanisms of injury, clinical presentation, interpret investigations, plan / institute the management of musculoskeletal injured patients and to recognize complications and their efficient management.

#### **Fracture classifications**

- Head injury & fasciomaxillary injury.
- General principles of management of neurovascular injury.
- Management of polytrauma.
- Consequences of musculoskeletal trauma & rehabilitation of the injured.

General principles of management of musculoskeletal trauma - surgical & conservative. - triage, disaster management, BTLS & ATLS

### **Systemic Complications in Orthopaedics**

- Shock
- Crush syndrome
- Disseminated Intravascular Coagulation (DIC)
- Acute Respiratory Distress Syndrome (ARDS)

Fracture healing, closed and open fractures, problems of union.

### **Malunited fractures**

Diagnosis of **delayed union**/non union& management.

Musculo skeletal trauma

### **Acute dislocations**

### **Old unreduced dislocations**

### **Recurrent dislocations**

### **Recent advances in internal fixation of fracture**

### **Bone grafting & bone substitutes**

### **Soft tissue coverage in fractures (example: skin flaps etc)**

### **Fracture complications and their treatment**

## **Regional:**

- **Fractures & dislocations of Cervical, Thoracic, Lumbar and sacral injuries.**
- **Fractures & dislocations of Shoulder girdle, pelvic girdle, upper limb & lower limb.**

## **Instruments & Implants in Advanced Orthopaedic Trauma Management:**

- Intra Medullary Nails and Locking compression plates
- LISS (Less Invasive Stabilisation System)
- Ilizarov technique

## **C. Arthroscopy**

- General Arthroscopy Principles

- Arthroscopy of Shoulder & Elbow
- Arthroscopy of Knee & Ankle

## D. Arthrodesis

- Arthrodesis of lower extremity and hip
- Arthrodesis of upper extremity
- Arthrodesis of spine

## E. Arthroplasty

- Biomechanics of joints and replacement of the following joints
- Hip
- Knee
- Ankle
- Shoulder
- Elbow

## F. ORTHOPAEDIC DISEASES:

Aetio-pathogenesis, clinical features, investigations and Management of Congenital and Acquired Limb Deficiencies and Deformities

Nutritional deficiency diseases affecting bone & joints

Metabolic & hormonal osteoarthropathies

Skeletal dysplasias and developmental diseases

Infective diseases of Musculoskeletal system, Polio, Pyogenic, Tubercular, Mycotic bone and joint infections

Rheumatoid Arthropathy, Rheumatic disease

Osteoarthritis, **Gout & Pseudogout**

Sero-negative spondyloarthropathies

Cerebral palsy, Poliomyelitis

Muscular Dystrophies

Nerve injuries

Osteonecrosis of bones (Perthes, Osgood-Schlatters, Kienbocks disease, Severs diseases etc,)

## G. Bone Tumors

- Benign bone tumors
- Malignant bone tumors
- Tumor like conditions
- Metastatic bone Tumors

#### **H. Amputations and Disarticulations**

- Amputations and disarticulations in the lower limb
- Amputations and disarticulations in the upper limb

#### **I. Prosthetics & Orthotics and Physical medicine**

#### **J. Musculoskeletal aids, orthotics & prosthesis**

#### **K. Non traumatic miscellaneous disorders of musculoskeletal system**

#### **L. Evaluation of physical disability**

#### **M. Pediatric Orthopaedics:**

- Fractures and dislocations in children
- Perthes' disease
- Slipped capital femoral epiphysis
- Developmental Dysplasia of Hip (DDH)
- Neuromuscular disorders

#### **N. Traumatic Disorders of Joints (Sports Injuries)**

- Ankle injuries
- Knee injuries
- Shoulder and elbow injuries
- Wrist and hand injuries

#### **O. Miscellaneous Diseases**

- Diseases of muscles
- Fibrous Dysplasia
- Unclassified diseases of bone
- Paget's disease
- Peripheral vascular disease
- Orthopaedic manifestations of bleeding disorders

#### **P. Biomaterials**

- Bio-degradable implants in Orthopaedics
- Bone substitutes
- Bone Banking

#### **Q. Recent Advances in Orthopaedics**



- Autologous chondrocyte implantation
- Mosaicplasty
- Video assisted Thoracoscopy (VATS)
- Endoscopic spine surgery
- Metal on Metal Arthroplasty of hip
- Surface replacement of joints
- Microsurgical techniques in Orthopaedics
- Computer Navigation Assisted Arthroplasty
- Designing a modern Orthopaedic operation theatre
- Sterilization
- Theatre Discipline
- Laminar air flow
- Modular OTs
- Nano Technology in Orthopaedics
- Dual Mobility Hip in THR
- Oxinium Knee
- Gender Specific Knee Prosthesis
- Double Bundle ACL Reconstruction
- Bone Morphogenic Proteins in Orthopaedics
- Tantalum Cups in THR
- Total Ankle Arthroplasty
- Total Elbow Arthroplasty
- Biodegradable Implants in Orthopaedics
- Expandable Megaprosthesis
- Bionic Arm
- Stem Cells in Orthopaedics
- Precountered Plates for Fracture Management
- Minimally Invasive Spine Surgery
- Role of PRP in Orthopaedics
- Myoelectric Prosthesis
- Dog Bone Button Technique for AC Joint Reconstruction
- Laminar Airflow in Orthopaedic Operation Theater
- Robotics in Orthopaedics
- Recent Medication in Orthopaedics (Denosumab, Teriparatide etc.,)
- Recent Advances in Imaging Modalities in Orthopaedics
- Implants for Fixation of Small Bones of Hand

#### R. Degenerative disorders of the spine

1. Prolapsed Inter Vertebral Disc (PIVD)
2. Lumbar Canal Stenosis (LCS)
3. Spondylolysis/Spondylolisthesis
4. Lumbar Spondylosis
5. Ankylosing Spondylitis
6. Spinal fusion: various types and their indications

#### S. DIAGNOSTIC SKILLS AND KNOWLEDGE OF

- a) Radiology:

- i) Plain Radiology, CT Scan, MRI, Bone scan & Ultrasonography
- ii) Interventional Radiography: Myelography, Sinogram, Arthrography & CT guided biopsy
- b) Biopsy: FNAC, Trocar & Open biopsy
- c) Arthroscopy

#### **T. SURGICAL SKILLS TO ACQUIRE:**

1. Management of shock in injured person
2. Incision and drainage of abscess
3. Aspiration and infiltration of joints
4. Closed reduction of fractures
5. Application of casts, splints & tractions
6. Fracture fixation: closed / open reduction & internal fixation of bones
7. Knowledge of debridement, surgical toilet & application of external fixators
8. Arthrotomy & Synovectomy
9. Arthroplasty & Arthrodesis
10. Foot and Ankle surgery
11. Plastic reconstruction and other reconstructive procedure of musculoskeletal trauma.
12. Acetabular fracture fixation and pelvic osteotomies
13. Elbow and hand surgery
14. Deformity correction with **External fixators like Illizarov, JESS, L.R.S (Limb Reconstruction system), etc..**
15. Spine surgeries
  - a. Disc surgery
  - b. Instrumentation in spine
  - c. Surgical procedure in T.B spine
  - d. Deformity correction in spine
16. Amputations
17. **Epidural injection for pain relief**

#### **V. TEACHING AND LEARNING ACTIVITIES:**

##### **A. Theoretical Teaching:**

1. **Lectures:** Lectures are to be kept to a minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated.
2. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book the relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.

3. **Subject Seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator should be announced in advance.
4. **Case Discussion:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the case presentation with names of the students should be announced in advance.
5. **Ward Rounds:** Ward rounds may be service or teaching rounds.
  - Service Rounds: Postgraduate students should do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.
  - Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose at the bed side. A diary should be maintained for day-to-day activities by the post-graduate students.  
Entries of (a) and (b) should be made in the Log book.
6. **Clinico-Pathological Conference:** Recommended once a month for all post graduate students. Presentation to be done by rotation. Presentations will be assessed using checklist. If cases are not available due to lack of clinical postmortems, it could be supplemented by published CPCs.
7. **Inter Departmental Meetings:** Strongly recommended particularly with departments of Pathology and Radio-Diagnosis at least once a month. These meetings should be attended by post-graduate students and relevant entries must be made in the Log Book.
 

Pathology: Interesting cases shall be chosen and presented by the post-graduate students and discussed by them as well as the senior staff of Pathology department. The staff of Pathology department would then show the slides and present final diagnosis. In these sessions the advanced immuno-histo-chemical techniques, the burgeoning markers, other recent developments can be discussed.

Radio-diagnosis: Interesting cases and the imaging modalities should be discussed. Emphasis should be given for the radiological differential diagnosis.
8. **Mortality / Morbidity Meetings:** The mortality meeting should be conducted in the department every month. The post graduate student should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting. The register to be maintained for the same.
9. **Teaching Skills:** Post-graduate students must teach under graduate students (eg. Medical, Nursing) by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by medical faculty as well as by the students. Record of their participation is to be kept in Log Book. Training of postgraduate students in Educational Science and Technology is recommended.

10. **Continuing Medical Education Programmes (CME):** Recommended that at least 1 state level CME programmes should be attended by each student during the course.

11. **Conferences:** Attending conferences is compulsory. Post-graduate student should attend one national and one state level conference during the course **and make either one poster / paper presentation.**

12) **Research Activities:** A post graduate student of a postgraduate degree course in broad specialties/super specialties would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published **as 1<sup>st</sup> author** during the period of his postgraduate studies so as to make him eligible to appear at the post graduate degree examination.

13 **Basic practices for post graduates at the initiation of course:**

A. **Good clinical practice** - post graduates should **undergo course in ethics including** good clinical practices which is essential for training for clinical research that involve human participants.

B. **BLS/ATLS** - post graduates should undergo BLS/ATLS course so they will be skillful to manage cases in emergencies.

C. **NPTEL**- all post graduates should undergo the BCBR course and clear NPTEL exams.

14. The Post-graduate students to be encouraged to carry out e-learning and research activities in the department other than dissertation work.

15. **Training in Research Methodology (Practice based learning, Evidence based practice)**

**B) Clinical / Practical Training:**

**SKILLS LAB SESSIONS:** to be conducted once a fortnight for all three years

**I<sup>st</sup> Year**

Trauma care

Closed reductions of fractures, Plaster application.

Debridement of open fractures, External fixations

Internal fixations of minor fractures with K wire

Non-traumatic conditions.

Manipulative correction of congenital problems like CTEV

Biopsies

Excision of benign lesions

Tendon lengthening, **Tenotomy** etc.

**BLS (Basic Life Support) Course and ATLS Course**

**II<sup>nd</sup> Year**

Trauma

Tension band wiring of fracture patella, fracture olecranon, etc

DCP of forearm bones, tibia, etc

DHS

Interlocking nailing of long bone fractures

Non traumatic conditions

Carpal tunnel release

Bone grafting

Soft tissue release under supervision

**III<sup>rd</sup> Year**

**Trauma**

Hemi replacement arthroplasty of femur

Dynamic condylar screw fixation

Acetabular fracture fixation

**Hemi arthroplasty of shoulder joint**

Osteotomies

Soft tissue release

Tendon transfers

Basic arthroscopy (diagnostic)

## **A] Basic graduate skills**

The students should have acquired the certain skills during his under-graduation and internship. These skills have to be reinforced at the beginning of the training periods. These skills include:

Procedure	Category	Year	Number
Insertion of I.V. lines. nasogastric tube, urinary catheters, etc.	PI	I	50
Minor suturing and removal of sutures	PI	I	50
Removal of tubes and drains	PI	I	50
Routine wound dressings	PI	I	50

## **B] Ward Procedures**

Ward work forms an important part of the training of the surgeon. In addition to the routine examination of the patient with proper recording of findings, diligent practice of the following is recommended.

Procedure	Category	Year	Number
Effusion of joints & L.I.H.C.	PI	I	5
Ability to teach UG's and Interns	PI	I	NA
Blood sampling- venous and arterial	PI	I	NA
Bone Marrow Aspiration	PI	I	2
Major wound dressing	PI	I	10
Communication skills with patients, relatives colleagues and paramedical staff	PI	I	NA*

Ordering of the requisite laboratory and radiological investigations and interpretation of the reports in light of the clinical picture	PI	I	NA
Proficiency in common ward procedures	PA	I	NA
Skills for Per-rectal examination and Proctoscopy	PI	I	NA
Thoracocentesis	PI	II	5
Universal precautions against communicable diseases	PI	I	NA
Venesection.	PI	I+II	5

NA: Not Applicable.

## C] ICU Procedures

Procedure	Category	Year	Number
Insertion of Arterial lines	PI	I+II	10
Insertion of Central venous lines	PI	I	10
Insertion of endotracheal tubes	PI	I+II	10
Intercostal Drainage	PI	I+II	5
Tracheostomy	PI	I	2
Working knowledge of ventilators and various Monitors	PI	I	NA
Interpretation of Arterial blood gases	PI	I	NA
Correction of Electrolyte disturbances	PI	I	NA
Prescribing Parenteral & Enteral nutrition	PI	I	NA

## D] Emergency Room Procedures

Procedure	Category	Year	Number
Application of Splints for Fractures	PI	I	NA
Arterial and Venous Lines	PI	I	NA
Assessment and initial management of polytrauma	PI	I	NA
Cardiopulmonary Resuscitation	PI	I	NA
Procedure	Category	Year	Number
Management of Airway obstruction	PI	I	NA
Management of shock and Cardiac Respiratory failure	PI	I	NA
Recognition and Initial management of Orthopaedic Emergencies	PI	I	NA
Suturing Techniques	PI	I	NA

## E] Pre-operative workup

Procedure	Category	Year	Number
Ability for adequate pre-operative preparation in special situations like diabetes, renal failure cardiac and respiratory failure etc. and risk Stratification	PI	I	NA
Communication skills with special reference to obtaining informed consent	PI	I	NA
Proper pre-operative assessment and preparation of patients including DVT prophylaxis, Blood transfusion and Antibiotics	PI	I	NA

## F] Post-operative Care

Procedure	Category	Year	Number
Airway management	PI	I	NA
Basic Physiotherapy & Rehabilitation	PI	I	NA
Management of epidural analgesia	PI	I	NA
Management of Sinus	PI	I	NA
Management of postoperative hypo and hypertension	PI	I	NA
Postoperative pain control	PI	I	NA
Skills for nutritional rehabilitation of patients.	PI	I	NA
Skills for proper Fluid & Antibiotic management	PI	I	NA
Amputation stump care	PI	I	NA

## G] Minor O.T. Procedure

Procedure	Category	Year	Number
Ganglion under Local Anesthesia	PI	I	5
Drainage of Abscesses	PI	I	5
FNAC	PI	I	5
Major dressings - Open fractures	PI	I	20
Release of compartment syndrome	PI	II	10
Minor Biopsies - Lymph node, ulcer swellings etc.	PI	I	20
Reduction and plaster application of simple fractures and dislocations	PA	I	10
Removal of simple subcutaneous swellings	PI	I	10
Arthrotomy, skeletal traction	PA/A/O	II	10
Suturing Techniques	PI	I	20
Arthroscopy	PA	II	5
Wound debridement	PI	II	10

## H] Major Operating rooms techniques

Procedure	Category	Year	Number
Instrument arrangement and trolley layout	PA	I	NA
Skills in sterilization techniques. O.T. Layout and Asepsis	O	I	NA
Skin preparation- painting and draping	PI	I	NA
Techniques of scrubbing and gowning	PI	I	NA

## I] Orthopaedic Operative Procedures

Procedure	Category	Year	Number
Percutaneous pin fixation for fractures	PI	I	10
External fixator application	PI	I	5
ORIF - Trochanteric fractures	PI and PA	III	1 and 3
Hemiarthroplasty - fracture neck femur	PA	III	2
Internal fixation for fracture shaft femur	PI	III	3
Internal fixation for fracture patella	PI	III	2
Internal fixation for fracture humerus	PI	III	2
Internal fixation for fracture both bones forearm	PI	III	3
Internal fixation for fractures of leg bones	PI	I	10

Management of complex fracture dislocation	PA/PI	II /III	5
Open reduction of dislocations	PA	III	2
Management of complex wounds	PI	I	10
Diagnostic & Therapeutic Arthroscopy	PA	III	1
Arthroplasty of Hip & Knee	PA	III	3
Repair of peripheral nerve injuries	PA	III	3
Amputation & Disarticulation	PI	III	3
Vascular repair	PA	III	2
CTEV - Soft tissue release	PI	III	5
HDP Habitual Dislocation Patella	PA/PI	II/III	1
Laminectomy	PA	III	2
Quadriceps plasty	PI	II	5
Spinal fusion	PA	III	3
Discoidectomy	PA/PI	II/III	10
Pott's spine surgeries	PA	II	5
Osteotomies	PA/O	III/II	3
ORIF Pelvic Fractures	PA/O	III/II	3
Reconstructive Surgery Of Great Toe ( Hallux Correction)	PA/O	III/II	5
Scoliosis Correction	PA/O	III/II	3
Tendon Transfers	PA/O	III/II	5
Tumour Surgery & Biopsy	PA/O	III/II	10
V..I.C - Bone Shortening	PA/O	III/II	5
Wrist Fusion	PA/O	III/II	4
Ring External Fixator (ILIZAROV)	PA/O	III/II	3
Implant Removal	PI/O	II	10
Polio Reconstruction	PA/O	III	5
AVNFH Decompression With Fibula Graft	PA/O	III	6
Rotator Cuff Surgery	PA/O	III	3
Arthrodesis - Upper Limb	PA/O	III	5
Arthrodesis - Lower Limb	PA/O	III	6
Fixation of fractures of the small bones of hand & foot	PI/O	II	10
Skin grafting	PI	II	10
Bone grafting	PI	II	10

O-Observed, A - Assisted, PA - Performed with Assistance, PI - Performed Independently

## J. Rotational Postings in other Departments:

**Anatomy** - one hour every week in anatomy dissection hall for 6 months in the first year

Applied subjects - posting in second year

**Trauma / emergency medicine** for 3 months, one month in 1<sup>st</sup> year, one month in 2<sup>nd</sup> year, one month in 3<sup>rd</sup> year

**Anaesthesia** for 2 weeks

**Radiology** including CT/ MRI for 2 weeks

**Neurosurgery** for one month

**Plastic surgery** for one month

**Allied subjects:** Posting in artificial limb center / physical medicine and rehabilitation for one month

## K. Training in teaching skills:

Bedside clinic for undergraduates for 15 hours



Bedside clinic for first year PG by third Year PG for 15 hours  
Should attend at least two national / state CME or Conferences during the course  
Should present at least one paper in any of the orthopedic conferences during the course.

## **VI. OTHER CRITERIA TO BE FULFILLED FOR THE DEGREE COURSE:**

### **1. Internal evaluation : Internal Formative Assessment**

During the course of three years, the department will conduct three tests. Two of them will be annual, one at the end of first year and other at the end of second year. The third test will be preliminary examination which may be held three months before the final examination.

#### **FORMATIVE ASSESSMENT, ie., assessment to improve learning**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self-directed learning and ability to practice in the system.

#### **General Principles**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination, should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

Along with these assessments, there will quarterly assessment based on following educational activities:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs
6. Mini Cex (mini clinic evaluation exercises) encounter - at least 4
7. Clinical encounter cards - at least 4
8. Direct observation of Procedural skills - at least 6 including Cadaver Dissection
9. OSCE/Theory, Essay, Short Notes

## **10. MCQ's**

## **11. Bone Skill Lab performance assessment**

**The student will be assessed periodically as per categories listed in postgraduate student appraisal form (in the Logbook).**

Results of all evaluations should be entered into P.G's diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

## **2. Maintenance of e-Log Book:**

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the University practical/clinical examination.

## **3. Dissertation:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners.

## **1. Eligibility requirements for PG Students in Broad Specialty and for appearing in University examination**

- 1) Have minimum one Poster Presentation or Podium Presentation at a National / Zonal / State Conference of his / her specialty.

- 2) Have minimum one Research paper published in Journal of his / her specialty as first author.
- 3) Complete an online course in Research Methodology (NPTEL) in the first year and submit the certificate generated on successful completion of the course and examination.
- 4) Complete a certification course in ethics including Good Clinical Practices and Good Laboratory Practices, (whichever is relevant to them) in the first year of the course conducted by institution.
- 5) Complete a certification course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills in the first year of the course conducted by the institution.
- 6) Thesis acceptance by all evaluators before the conduct of University Examination.
- 7) **Attendance 80% mandatory.**

## VII. SCHEME OF EXAMINATION: (Final Summative Assessment)

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

### A. Theory: 400 Marks

There shall be four papers, each of three hours' duration. Total marks of each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

**Theory** **400 Marks**

No. of Theory Paper 4

Marks for each paper 100

Total Marks four Theory papers 400

Passing Criteria for theory Total Aggregate: 200/400 (40% minimum in each paper)  
(The Aggregate marks of all four theory paper should not be less than 50%)

### THEORY QUESTION PAPER PATTERN:

Type of Questions	No. of Questions	Marks for each question	Total Marks
Long essay	10	10	100
<b>Grand Total</b>			<b>100</b>

The above pattern of marks holds good for each of the papers.

Paper I	- Basic sciences as applied to the subject	- 100 marks
Paper II	- Traumatology and Rehabilitation	- 100 marks
Paper III	- Orthopaedic Disease	- 100 marks
Paper IV	- Recent advances in Orthopedic surgery & General Surgery as applied to Orthopaedics	- 100 marks

**Note :** The distribution of chapters/topics shown against the papers are suggestive only and may overlap or change.

### **3. Practical/clinical and Oral/viva voce examination**

#### **Practical examination**

Practical examination should be spread over **two days** and include various major components of the syllabus focusing mainly on the psychomotor domain.

**Oral/Viva voce examination** on defined areas should be conducted by each examiner separately. Oral examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject focusing on psychomotor and affective domain. It should include:

It Includes :

- Ortho Radiology
- Ortho Pathology
- Gross anatomy
- Instruments
- Orthotics and Prosthetics

**Maximum of 8 candidates per day for the practical examination**

**A candidate shall secure can aggregate of 50% separately in theory (each paper minimum of 40%) and practical to be declared as pass in the examination.**

**University shall conduct not more than 2 examinations in a year, with the interval not less than 4 months and not more than 8 months between the two examinations.**

## B. Clinical / Practical Examination: 300 Marks

To elicit competence in clinical skills and to discuss differential diagnostic therapeutic aspects.

Types of Cases	No. of Cases	Marks
Long Case	1	100
Short Cases	2 (50 marks each)	100
Ward Round	2 Cases (25 Marks each)	50
Dissertation/Paedagogy		20
OSPE (6 Station x 5 Marks each)		30
Total		300

## C. Viva- Voce Examination: 100 Marks

**Aims:** To elicit candidate's knowledge and investigative/ therapeutic skills.

**Viva-voce examination - [100 Marks]**

Sl No	Viva Table	Marks distribution
1	Instrument	20
2	Specimen + Osteology	20
3	X Rays	20
4	Pedagogy + Log Book	20
5	Operative Surgery Techniques + Orthotics & Prosthetics	20
	<b>Total Marks</b>	<b>100</b>

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. Instruments, Specimen + Osteology, X-Rays+CT scan images, Pedagogy + Log Book, Operative Surgery + Orthotics & Prosthetics

Pedagogy Exercise and Log Book

- (i) Candidate is asked to make a presentation for 8 - 10 minutes on a topic given in the beginning of clinical examination. 10 Marks
- (ii). Candidate is asked to make a presentation for 8 - 10 minutes on the dissertation topic and the review of Log Book. 10 Marks

Passing Criteria for Practical & Viva Voce: Total Aggregate to 50%

## D. Maximum Marks:

Maximum marks for in Orthopaedics	M.S.	Theory	Practical	Viva	Grand Total
		400	300	100	800

## VII. RECOMMENDED BOOKS (LATEST EDITIONS):

- 1) Campbell's Operative Orthopaedics, Vols 1, 2, 3 & 4 Campbell's Operative Orthopaedics, 4-Volume Set, 14<sup>th</sup> Edition by Frederick M Azar, MD, S. Terry Canale, MD and James H. Beaty, MD
- 2) Mercer's Orthopaedic Surgery Vol. 1 & 2, Author(s) : Robert B Duthie Edition: Ninth, Year of Publication: 2003
- 3) Rockwood And Greens - Fractures in Adults, Vol 1& 2 Rockwood and Green's Fractures in Adults Author(s): Paul Tornetta , William Ricci MD, FAAOS, Charles M. Court-Brown MD, FRCS Ed (Orth), Margaret M. McQueen MD, Michael McKee MD, FRCS (C) Publication Date: March 27, 2019
- 4) Fractures in Children - Rockwood & Wilkins - Rockwood and Wilkins Fractures in Children Edition: 9. Author(s): Peter M Waters MD, David L. Skaggs MD, John M. Flynn. Publication Date: March 19, 2019
- 5) Paediatric Orthopaedics - Tachidjian, Vol 4 Tachdjian's Pediatric Orthopaedics: From the Texas Scottish Rite Hospital for Children, 6th edition - November 27, 2020 Author: John Herring
- 6) Concise System Of Orthopaedics And Fractures - Graham Apley Apley's Concise System of Orthopaedics and Fractures Louis Solomon, David Warwick, Selvadurai Nayagam CRC Press, 31-Mar-2005
- 7) Textbook of Orthopaedics and Trauma - Kulkarni, Vol 1 Textbook of Orthopedics and Trauma (4 Volumes) GS Kulkarni, Sushrut Babhulkar, Publish Year 2016
- 8) B.D. Chaurasia's Human Anatomy, Vol1, Vol 2, Vol 3 B D Chaurasia's Handbook of Anatomy English Editions 2022 Eighth Editions Volume 2 (paperpack, CHAURASIAS), Author: CHAURASIAS, Publisher: CBS Publishers, Publishing Date 2022
- 9) Pharmacology and Pharmacotherapeutics - Satoskar- Pharmacology and Pharmacotherapeutics, 24<sup>th</sup> Edition - June 30, 2015, Authors: RS Satoskar, Nirmala Rege, SD Bhandarkar
- 10) Orthopaedics Anatomy and Surgical Approaches Frederick Wreckling Orthopaedic Anatomy and Surgical Approaches Edited by Frederick W. Reckling, Jo Anne B. Reckling and Melvyn P. Mohn, S. P. Frostick, First Published August 1, 1991
- 11) Green's Operative Hand Surgery-Vol. 1& 2, Green, David P; Hotchkiss, Robert N Green's Operative Hand Surgery, 2-Volume Set 7<sup>th</sup> Edition - February 24, 2016, Authors: Scott W. Wolfe, William C. Pederson, Scott H. Kozin, Mark S. Cohen
- 12) Surgical Exposures in Orthopedics: The Anatomic Approach, Hoppenfeld, Stanley; De Boer, Piet Surgical Exposures in Orthopaedics: The Anatomic Approach, Edition: 6,

Author(s): Piet de Boer MD, Richard Buckley MD, FRCSC, Stanley Hoppenfeld MD,

Publication Date: October 7, 2021

- 13) Text Book of Ilizarov Surgical Techniques Bone Correction And Lengthening,  
Golyakhovsky, Vladimir; Frankel, Victor H Textbook of Ilizarov Surgical Techniques:  
Bone Correction and Lengthening by Vladimir Golyakhovsky, Victor H Frankel, Publishing  
Year 2010
- 14) Applied Orthopaedic Biomechanics, Dutta, Santosh; Datta, Debasis Applied Orthopaedic  
Biomechanics, by Debasis Datta Santosh K Dutta Publisher : B.I.Publications, Year 2008.

Sl, No	Name of the Book	Author	Publisher
1.	Cambell's Operative Orthopaedics,	Terry Canale assistance by Kay Daughtery.	Mosby
2.	Fractures in Adults and Children	Charles. A. Rockwood Jr, David Green, Robert. E. Bucholz & James. D. Heckman- Lippincot	Lippincot, Williams & Wilkinson.
3.	Tureks Orthopedics	By- Weinstein. SL. & Others,	Lippincot, Williams & Wilkinson.
4.	Mercer's Orthopaedic Surgery	By- Robert. B. Duthie. & George. Bentley.	Hodderd&ARNOLD
5.	Watson-Jones Fractures & Joint Injuries	By- J. N. Wilson	Churchill-Livingstone.
6.	Total Hip Joint Replacement	Eftekhar. N. S.	Mosby
7.	By- Gustilo	Fractures & Dislocations	Mosby
8.	Pediatric Orthopaedics	Sharrard	Blackwell Scientific
9.	Pediatric Orthopaedics	Tachdain	W.B.Saunders
10.	Clinical Surgery	Das	S. Das.
11.	Clinical Orthopaedic Examination	Ronald McRae	Churchill Livingstone
12.	Splints & Traction in Orthopaedics	Stewart	Churchill Livingstone
13.	Tuberculosis of Spine	Tuli. S. M.	Jaypee brothers
14.	AO Principles of Fracture Management	Colton. C. L. Fernandez. A.	Theime Medical Publishers.
15.	Manual of Internal Fixation	Muller & others	Springer
16.	Operative Arthroscopy	McGinty	Lippincot,
17.	Rothman-Simeon- The Spine	H.N.Herkowitz & Others	Saunders
18.	Lister's The Hand	Paul smith	Churchill Livingstone
19.	The Lumbar Spine	J. N. Weinstein & S. W. Wiesel	Saunders
20.	Bone Tumors	J. M. Mirra	Lee &Febiger
21.	Campbell's operative Orthopaedics	12 <sup>th</sup> edition	Churchill Livingstone
22.	Insall & Scott surgery of knee	5 <sup>th</sup> edition	Elsevier

#### VIII. RECOMMENDED JOURNALS:

1	Journal of bone and Joint Surgery
2	American Journal of Orthopaedics
3	Clinical Orthopaedics and Related Research
4	Orthopaedic clinics of North America
5	Trauma
6	Arthroscopy
7	Indian Journal of Orthopaedics
8	Journal of Arthroplasty
9	Journal of Spine Surgery
10	ActaOrthopedica Scandinavia
11	<b>J.Paed. Ortho</b>



Student appraisal form for MS in Orthopedics											
	Element	Less than Satisfactory			Satisfactory			More than satisfactory			Comments
		1	2	3	4	5	6	7	8	9	
<b>1</b>	<b>Scholastic Aptitude and Learning</b>										
1.1	Has Knowledge appropriate for level of training										
1.2	Participation and contribution to learning activity (e.g., Journal Club, Seminars, CME etc.)										
1.3	Conduct of research and other scholarly activity assigned (e.g Posters, publications etc.)										
1.4	Documentation of acquisition of competence (eg. Log book)										
1.5	Performance in work based assessments										
1.6	Self- directed Learning										
<b>2</b>	<b>Care of the patient</b>										
2.1	Ability to provide patient care appropriate to level of training										

2.2	Ability to work with other members of the health care team										
2.3	Ability to communicate appropriately and empathetically with patients families and care givers										
2.4	Ability to do procedures appropriate for the level of training and assigned role										

2.5	Ability to record and document work accurately and appropriate for level of training										
2.6	Participation and contribution to healthcare quality improvement										
<b>3</b>	<b>Professional attributes</b>										
3.1	Responsibility and accountability										
3.2	Contribution to growth of learning of the team										
3.3	Conduct that is ethical appropriate and respectful at all times										
<b>4</b>	<b>Space for additional comments</b>										
<b>5</b>	<b>Disposition</b>										
	Has this assessment been discussed with the trainee?	Yes	No								
	If not explain										
	Name and Signature of the assessee										
	Name and Signature of the assessor										
	Date										

SIGNATURE OF ASSESSEE

SIGNATURE OF CONSULTANT

SIGNATURE OF HODs



# **POST GRADUATE COURSE**

## **M.S. IN OBSTETRICS AND GYNECOLOGY**

### **I. PREAMBLE:**

The goal of the post graduate degree course in Obstetrics and Gynecology shall be to train the student to acquire competencies pertaining to Obstetrics and Gynecology that are required to practice at all levels of health system in the community and globally.

### **II. SUBJECT SPECIFIC LEARNING:**

#### **PROGRAMME OBJECTIVES:**

The goal of the MS course in Obstetrics and Gynecology is to produce a competent Obstetrician and Gynecologist who can:

- a. Provide quality care to the women in the diagnosis and management of Antenatal, Intra-natal and Post-natal period of normal and abnormal pregnancy and labor.
- b. Provide effective and adequate care to a normal and high risk neonate.
- c. Manage effectively all gynecological (routine and emergency) if necessary make appropriate referrals.
- d. Provide quality care to the community in the diagnosis and management of gynecological problems including screening, and management of all gynecological cancers.
- e. Conduct a comprehensive evaluation of infertile couple and have a broad based knowledge of assisted reproductive techniques including- ovulation induction, in vitro fertilization and intra-cytoplasmic sperm injection, gamete donation, the legal and ethical implications of these procedures.
- f. Provide counseling and delivery of fertility regulation methods including reversible and irreversible contraception, emergency contraception etc.
- g. Manage spontaneous abortion and medical termination

### **III. COURSE CONTENTS:**

#### **Theory:**

<b>PAPER I</b>	<b>Applied Basic Science</b>
<b>PAPER II</b>	<b>Obstetrics including social obstetrics and diseases of newborn</b>
<b>PAPER III</b>	<b>Gynecology including fertility regulation</b>
<b>PAPER IV</b>	<b>Recent Advances in Obstetrics and Gynecology</b>

## **PAPER I: Applied Basic Sciences**

- 1) Normal & abnormal development, structure, malformation and function of urogenital system.
- 2) Physiology of Menstrual cycle, ovulation.
- 3) Anatomy, Histology, Physiology of breast.
- 4) Applied anatomy of genitourinary system, abdomen, pelvis and perineum, supports of uterus.
- 5) Endocrinology related to female reproduction.
- 6) Physiology of Spermatogenesis.
- 7) Anatomy, physiology, development, structure & function of placenta, umbilical cord & amniotic fluid.
- 8) Abnormal placentation.
- 9) Maternal adaptation to pregnancy in each organ system and post-partum changes.
- 10) Anatomical and biochemical changes in uterus and cervix during pregnancy, labor.
- 11) Lactation – physiology and pathology.
- 12) Fetal growth:
  - i. Conception
  - ii. Embryonic development
  - iii. Fetal development.
- 13) Pharmacology (pharmacokinetics, pharmacodynamics, teratogenicity, FDA classification for drug safety) of drugs used during pregnancy, labor, postpartum period & lactation.
- 14) Pharmacology of drugs used in gynecology.
- 15) Physiological & neuroendocrinological changes during puberty, adolescence and post menopause.
- 16) Humoral and cellular immunology in obstetrics and gynecology.
- 17) Role of hormones in Obstetrics & Gynecology.
- 18) Normal microbiome and natural defence mechanism of female genital tract.
- 19) Evaluation of various anatomical and functional disorders associated with infertility.

- 20)** Cervical changes and prevention of HPV infection and HPV vaccination.
- 21)** Pathophysiology of ovaries, fallopian tubes, uterus, cervix, vagina and external genitalia in healthy and diseased conditions.
- 22)** Tumor markers and their significance.
- 23)** Basic medical genetics including cytogenetics
- i.** Pattern of inheritance
  - ii.** Chromosomal abnormalities - types, incidence, diagnosis, management and recurrence risk.
  - iii.** General principles of teratology.
  - iv.** Screening, counselling and prevention of developmental abnormalities.
  - v.** Birth defects – genetics, teratology & counselling.
  - vi.** Prenatal diagnosis
  - vii.** Preconceptional counseling
- 24)** Congenital Malformation of female reproductive tract, diagnosis and management.
- 25)** Universal precautions need to be taken in examination of the patient and surgical procedures for the prevention of HIV and other diseases.
- 26)** Planning and implementation of preventive strategies.
- 27)** Paediatric, adolescent and geriatric gynecology.
- 28)** Intersex , ambiguous and chromosomal abnormalities.
- 29)** Infertility – Evaluation and management.
- 30)** Menopause – Physiology, Clinical features and Prevention of its complications.
- 31)** Care of newborn – normal and high risk newborn.
- 32)** Preventive health care in gynecology-screening for gynecological malignancies, Carcinoma cervix, endometrial, vulval malignancies, HPV vaccination.

## **PAPER II: Clinical Obstetrics**

- 1) Prenatal Care:** Prenatal care of normal pregnancy including
- A. Antenatal examination.

- B. Nutrition and immunization in pregnancy.
- C. Obstetric ultrasound: Dating, anomaly, growth and Doppler Ultrasound
- D. Screening for aneuploidies & pre-eclampsia.
- E. Prenatal diagnostic procedures.

**2) Identification and management of early pregnancy complications like:**

- A. Abortions
- B. Ectopic pregnancy
- C. Gestational trophoblastic diseases
- D. Hyperemesis gravidarum.
- E. Cervical incompetence.
- F. Recurrent pregnancy loss- APLA syndrome.
- G. MTP.

**3) Identification and management of obstetric complications like:**

- A. Antepartum haemorrhage
- B. Hypertensive disorders (pre-eclampsia, eclampsia, other associated hypertensive disorders).
- C. Anaemia in pregnancy
- D. Rh-immunization.
- E. Diabetes in pregnancy (GDM and Overt Diabetes)
- F. Preterm birth.
- G. Multiple pregnancy and its complications.
- H. Post term pregnancy.
- I. Fetal growth restriction.
- J. Hydramnios and Oligohydramnios.
- K. Placenta accreta spectrum (PAS).
- L. Pregnancy with previous caesarean delivery.
- M. Intra uterine death.
- N. Bad obstetric history.

**4) Identification and management of medical and surgical complications like:**

- A. Heart disease in pregnancy
- B. Thromboembolic disorders
- C. Endocrine disorders - Thyroid disorders in pregnancy
- D. Dermatological disorders.
- E. Hematological disorders.
- F. Obesity.
- G. Neurological disorders.
- H. Hepatic, Biliary and Pancreatic disorders.
- I. Renal and urinary tract disorders.



J. Acute abdomen – surgical emergencies and GI emergencies.

**5) Evaluation of fetal& maternal health in complicated pregnancies by making use of diagnostic modalities including USG, Doppler, MRI, electronic fetal monitors and plan for safe delivery for mother and fetus, identifying fetus at risk & its management.**

**6) Infections in pregnancy (bacterial, viral, fungal)**

- a. Malaria, Dengue virus, Toxoplasmosis, Rubella, CMV, Herpes (TORCH infections), HIV in pregnancy, viral hepatitis (A,B,C etc.,)
- b. COVID in Pregnancy.
- c. Sexually transmitted infections (STIs).
- d. Maternal to fetal transmission of infections.

**7) Management of pregnancies complicated by gynecological disorders:**

- A. Congenital genital tract developmental anomalies,
- B. Fibroid uterus,
- C. Cancer cervix,
- D. Genital prolapse.

**8) Normal labour:**

- A. Physiology of normal of labour.
- B. Mechanism and conduct of normal labour – management of first stage , second stage and third stage of labour.
- C. AMTSL in third stage of labour.
- D. Partographic monitoring of labour progress, recognition of abnormal labour and its appropriate management.
- E. Induction and augmentation of labour.
- F. Obstetric analgesia and anesthesia.
- G. Labour Care Guide(LCG)

**9) Abnormal labour:**

- A. Malpositions and malpresentations.
- B. Abnormal uterine action.
- C. Prolonged labour, obstructed labour, Cervical dystocia, arrest of labour
- D. Assessment of pelvis, Contracted pelvis and cephalo pelvic disproportion
- E. Abnormal pelvis, Soft tissue abnormalities of birth canal.
- F. Maternal & fetal monitoring in abnormal labour (including electronic fetal monitoring).
- G. Identification and management of intrapartum complications- cord presentation, cord prolapse, fetal distress.

**10) Instrumental deliveries (forceps, ventouse), Cesarean sections , Destructive operations.**

**11) Identification and management of genital tract trauma – perineal tears , cervical – vaginal tears , rupture uterus.**

**12) Postpartum**

- A. Identification and management of atonic PPH.
- B. Identification & management of traumatic PPH.
- C. Retained placenta, inversion of uterus, amniotic fluid embolism.
- D. Management of secondary postpartum haemorrhage.
- E. Management of Shock in Obstetrics.
- F. Management of critically ill women.
- G. Coagulation disorders including DIC & use of blood and blood components/ products, Massive transfusion protocol.
- H. Postpartum contraception and puerperal sterilization
- I. Normal and abnormal puerperium - sepsis, thrombophlebitis, mastitis, psychosis.

**13) New Born**

- A. Diagnosis of birth asphyxia and neonatal resuscitation.
- B. Breast feeding practice, counselling & importance of breast-feeding, problems in breast-feeding and their management, baby friendly practices.
- C. Problems of new born at birth (resuscitation) and management of early neonatal problems.
- D. Human milk bank
- E. Neonatal sepsis- prevention, detection and management.
- F. Neonatal hyperbilirubinemia – investigations and management.
- G. Birth trauma- detection and management.
- H. Detection and management of fetal/ neonatal malformations.
- I. Management of common neonatal problems.

**14) Operative Obstetrics:**

- A. Indications and technique, preoperative and postoperative management of obstetric surgeries, Episiotomy, Cesarean Section instrumental deliveries, obstetric hysterectomy, destructive operations ,
- B. MTP – safe abortion , selection of cases , techniques , and management of complications , Medical termination of pregnancy procedures
- C. MTP Act
- D. External cephalic version, internal podalic version, manual removal of placenta,
- E. surgical management of PPH.
- F. Operative management of ectopic pregnancy

**PAPER III: CLINICAL GYNECOLOGY AND FERTILITY REGULATION**

**1) Benign conditions:**

- a. Epidemiology and etiopathogenesis of gynecological disorders.
- b. Fibroid uterus, Endometriosis & adenomyosis , Endometrial hyperplasia Genital prolapse(uterine & vaginal), Retroversion and retroflexion, Cervical erosion, cervicitis, cervical Polyps, cervical neoplasia, Vulval and vaginal cysts, infections, acute and chronic ectopic benign lesions and intra epithelial neoplasia, Benign ovarian pathology, Benign breast disease.
- c. Benign tumours of genital tract- fibroid uterus, broad ligament tumours, benign ovarian tumours and cysts, benign tumours and lesions of fallopian tube, vulva and vagina.
- d. Gynecological disorders in pregnancy- Prolapse, ovarian tumour and fibroid
- e. Injuries to female genital tract.
- f. Management of patients with terminal disease.
- g. Acute and chronic pelvic pain – diagnosis and management.
- h. Reproductive endocrinology: evaluation of primary & secondary a menorrhoea, management of hyperprolactinemia, hirsutism, chronic anovulation, PCOD, thyroid, obesity and other endocrine dysfunctions.
- i. Infertility- Evaluation and management.
- j. Male infertility.
- k. Methods of ovulation induction.
- l. Management of immunological factors of infertility.
- m. Obesity.
- n. Basic knowledge of Advanced Assisted Reproductive Techniques (ART).
- o. Osteoporosis in Gynecology- Prevention and Management.
- p. Menopause: problems- vasomotor symptoms, sexual dysfunction prevention and management (HRT) of its complications.
- q. Uro - Gynecological problems- diagnosis and management. urinary tract infection ,uro-genital fistulae, incontinence and other uro- gynecological problems.
- r. Psychological aspects of gynecological diseases.

## 2) **Disorders of menstruation :**

- a. Abnormal uterine bleeding, amenorrhoea (primary/ secondary), polycystic ovarian disease
- b. Endocrine disorders, Hyperprolactinemia, galactorrhoea, hyperandrogenism thyroid, pituitary and adrenal disorders.

## 3) **Malignant conditions:**

- a. Risk analysis in gynecological malignancies.
- b. Premalignant lesions of genital tract-vulva, uterus, vagina.
- c. Malignant genital neoplasia of ovary, fallopian tubes, uterus, cervix, vagina, vulva, gestational trophoblastic diseases and carcinoma breast.

- d. Principles of radiotherapy and chemotherapy in gynecological malignancies - choice, schedule of administration & complications of such therapies.
- e. Adjuvant therapy in gynecological malignancies.
- f. Hormonal and immunotherapy in gynecological malignancies.

**4) Infections in gynecology:**

- a. Sexually Transmitted Diseases and Reproductive tract infections including HIV and genital tuberculosis- prevention, diagnosis & treatment.
- b. Acute and chronic infections of genital tract- PID.

**5) Imaging:**

- a. Imaging techniques in gynecology- scope of abdominal, pelvic ultrasound, Doppler ultrasound, HSG, Sono salpingogram, CT, MRI and PET scan.
- b. Interventional radiology.

**6) Operative gynecology:**

- a. Abdominal incisions, suture materials, instruments and knotting techniques.
- b. Surgical procedures for genital prolapse, fibromyoma, endometriosis, ovarian, adnexal, uterine, cervical, vaginal and vulval pathology.(Benign and malignant), Abdominal and vaginal hysterectomy.
- c. Preoperative evaluation, preoperative care and postoperative care & management of postoperative complications.
- d. Indications, techniques and management of hysteroscopic , laproscopic procedures in gynecology (diagnostic and therapeutic).

**7) Social Obstetrics (Family welfare and Demographics):**

- a. The importance of demography in obstetrics and gynecology.
- b. Maternal mortality, perinatal mortality/ morbidity, birth rate and fertility rate.
- c. Organizational and operational aspects of National Health Policies and Programs, in relation to population and family welfare including RCH.
- d. Knowledge of contraceptives - Temporary methods, Permanent methods.
- e. Provide adequate services to service seekers of contraception including follow up.
- f. Demography and population dynamics.

## **PAPER 4: RECENT ADVANCES**

- 1) Recent advances in obstetrics and gynecology, management of family planning, infertility, contraception.**
- 2) Fetal intrauterine intervention**
- 3) Recent advances in diagnosis, screening, staging and management gynecological cancers.**



## IV. SYLLABUS TERM WISE (THEORY)

### A. OBSTETRICS:

1 <sup>st</sup> Term	<ol style="list-style-type: none"><li>1. Anatomy of Female reproductive organs</li><li>2. Fundamentals of reproduction</li><li>3. The Placenta and Fetal Membranes</li><li>4. The Fetus</li><li>5. Physiological Changes During Pregnancy</li><li>6. Endocrinology In Relation to Reproduction</li><li>7. Diagnosis of Pregnancy</li></ol>
2 <sup>nd</sup> Term	<ol style="list-style-type: none"><li>1. The Fetus-in-utero</li><li>2. Fetal skull and Maternal Pelvis</li><li>3. Antenatal Care, Preconceptional Counselling and Care</li><li>4. Antenatal Assessment of Fetal wellbeing</li><li>5. Prenatal Genetic Counselling, Screening and Diagnosis</li><li>6. Normal Labour</li><li>7. Normal Puerperium</li></ol>
3 <sup>rd</sup> Term	<ol style="list-style-type: none"><li>1. Vomiting in Pregnancy</li><li>2. Hemorrhage in Early Pregnancy</li><li>3. Multiple Pregnancy, Amniotic Fluid Disorders, Abnormalities of Placenta &amp; Cord</li><li>4. Hypertensive Disorders in Pregnancy</li><li>5. Antepartum Haemorrhage</li><li>6. Medical and Surgical Illness Complicating Pregnancy</li><li>7. Gynecological Disorders in Pregnancy</li></ol>
4 <sup>th</sup> Term	<ol style="list-style-type: none"><li>1. Preterm Labor and Birth, Preterm Rupture of the Membranes, Prolonged Pregnancy, Intrauterine Fetal Death</li><li>2. Complicated Pregnancy</li><li>3. Contracted Pelvis</li><li>4. Abnormal uterine action</li><li>5. Complicated labor-malposition, malpresentation and cord prolapse</li><li>6. Prolonged labor, obstructed labor, dystocia caused by fetal anomalies</li><li>7. Complications of third stage of labor</li></ol>

5 <sup>th</sup> Term	<ol style="list-style-type: none"> <li>1. Injuries to birth canal</li> <li>2. Abnormalities of the puerperium</li> <li>3. The term newborn infant</li> <li>4. Low birth weight baby</li> <li>5. Disease of the fetus and the newborn</li> <li>6. Pharmacotherapeutics and obstetrics</li> <li>7. Induction of labor</li> </ol>
6 <sup>th</sup> Term	<ol style="list-style-type: none"> <li>1. Population dynamics and control of conception</li> <li>2. Operative Obstetrics</li> <li>3. Safe motherhood, Epidemiology of obstetrics</li> <li>4. Special topics in obstetrics: intrapartum fetal monitoring, shock in obstetrics, acute kidney injury in pregnancy, blood coagulation disorders in pregnancy, immunology and critical care.</li> <li>5. Current topics in obstetrics: Day care obstetrics, legal ethical issues and audit in obstetrics, PCPNDT techniques and act, Cord blood banking and stem cell therapy.</li> <li>6. Imaging in Obstetrics, Amniocentesis and Guides to Clinical tests</li> <li>7. Practical obstetrics: Instruments and specimens.</li> </ol>

## B. GYNECOLOGY

1 <sup>st</sup> term	<ol style="list-style-type: none"> <li>1. Anatomy of the female pelvic organs</li> <li>2. Blood vessel, Lymphatic drainage and Innervation of Pelvic Organs</li> <li>3. Development of Genital Organs and Gonads</li> <li>4. Congenital Malformation of Female Genital Organs</li> <li>5. Puberty- Normal and Abnormal</li> <li>6. Menopause</li> </ol>
2 <sup>nd</sup> Term	<ol style="list-style-type: none"> <li>1. Neuroendocrinology in Relation to Reproduction</li> <li>2. Menstruation</li> <li>3. Examination of a Gynecological Patient and the Diagnostic Procedures</li> <li>4. Imaging Techniques, Other Diagnostic procedures and lasers in Gynecology</li> <li>5. Pelvic Infection</li> <li>6. Sexually Transmitted Infections</li> </ol>

3 <sup>rd</sup> Term	<ol style="list-style-type: none"> <li>1. Infections of the individual Pelvic organ</li> <li>2. Dysmenorrhea and other disorders of menstrual cycles</li> <li>3. Abnormal Uterine Bleeding</li> <li>4. Displacement of the uterus</li> <li>5. Infertility</li> <li>6. Benign lesions of the Vulva and Vagina</li> </ol>
4 <sup>th</sup> term	<ol style="list-style-type: none"> <li>1. Benign lesions of the Cervix</li> <li>2. Benign lesions of the Uterus</li> <li>3. Benign lesions of the Ovary</li> <li>4. Endometriosis and Adenomyosis</li> <li>5. Premalignant lesions</li> <li>6. Genital malignancy</li> </ol>
5 <sup>th</sup> term	<ol style="list-style-type: none"> <li>1. Urinary problems in gynaecology</li> <li>2. Genitourinary fistulae</li> <li>3. Genital tract injuries and Anorectal Dysfunctions</li> <li>4. Disorders of Sexual Development</li> <li>5. Amenorrhea</li> <li>6. Contraception</li> <li>7. Basic Principles of Radiation therapy, Chemotherapy, Immunotherapy and Gene therapy in Gynecology</li> </ol>
6 <sup>th</sup> term	<ol style="list-style-type: none"> <li>1. Hormones in Gynecological practice</li> <li>2. Gynaecological problems from birth to adolescence</li> <li>3. Special topics: Leucorrhoea, post menopausal bleeding, chronic pelvic pain, breast disorders, psychosexual problems, abdomino-pelvic lump, adnexal mass, hirsutism and galactorrhoea</li> <li>4. Operative Gynaecology</li> <li>5. Endoscopic surgery in Gynaecology</li> <li>6. Current topics in Gynecology: Stem cell and therapies in gynaecology</li> <li>7. Practical Gynecology: specimen, instruments, sutures and imaging studies</li> </ol>



## V. SUBJECT SPECIFIC COMPETENCIES

### A. Cognitive Domain:

#### 1st term

1. Recognizes the health needs of women and adolescents and carries out professional obligations in keeping with principles of national health policy and professional ethics.
2. Knowledge on fundamentals of reproduction, placenta and fetal membranes, physiological changes during pregnancy, endocrinology in relation to reproduction and diagnosis of pregnancy.
3. Knowledge of fetal skull and maternal pelvis.
4. Knowledge on antenatal care.
5. Knowledge of basic anatomy of genital tract and common gynaecological problems.
6. Shall be oriented to principles of research methodology.
7. Interpretation of various laboratory investigations and other diagnostic modalities in Obstetrics & Gynecology.
8. Should have elementary knowledge of female breast & its diseases.
9. Should have knowledge on vital statistics in Obstetrics & Gynaecology.
10. Should have knowledge on STD and AIDS & Government of India perspective on women's health related issues.
11. Should have knowledge on Asepsis, sterilization and disposal of medical waste as per NABH recommendations.
12. Maintain medical records properly and know the medico-legal aspects with respect to Obstetrics & Gynaecology
13. Knowledge of importance of proper recording of facts about history taking.
14. Examination findings, investigation reports and treatment administered in all patients.
15. Elementary knowledge about per speculum, vaginal examination, bimanual and rectal examination.
16. Understanding of social, educational and health needs of adolescent girls and menopausal women , planning and implementation of intervention programs.
17. Universal precautions need to be taken in examination of the patient and surgical procedures for the prevention of HIV and other diseases.
18. Knowledge about attitude, ethics, communication (AETCOM).

## **2nd term**

1. Should acquire the competencies related to Obstetrics and Gynaecology that are required to be practiced in the community and at all levels of health care system.
2. Knowledge about physiology, mechanism and conduct of normal labour.
3. Knowledge about Intra partum and immediate Postpartum care.
4. Acquire a full understating of all common usage of computing systems including the principles of data collection, storage, retrieval, analysis and presentation.
5. Understand National Health Programmes related to Obstetrics and Gynaecology and should be aware of all the Acts and Laws related to speciality.
6. Education regarding rights and confidentiality of women's health, specifically related to reproductive function, sexuality, contraception and safe abortion.
7. Recognise the importance of health of adolescent girls.
8. Understanding, planning and intervention program of social, educational and health needs of menopausal women.
9. Gynecological Diagnosis-History taking and Examination in gynecology- common symptoms in gynecology, general examination including breast and thyroid examination, per abdomen, local examination of external genitalia, per speculum examination, per vaginal, and per rectal examination.
10. Diagnose and manage common gynecological diseases like Pelvic inflammatory diseases, RTI, Abnormal uterine bleeding.
11. Knowledge of various Acts and Laws while practicing Obstetrics and Gynaecology, particularly MTP Act and sterilization, Preconception and P.N.D.T. Act.
12. Should have knowledge on Reproductive and Child Health, family welfare .
13. Should be able to effectively communicate with the family and the community .
14. Should have knowledge about preconceptional care and counselling.
15. Shall provide quality care to the women in the diagnosis and management of antenatal, intra-natal & postnatal period of normal and abnormal pregnancy.

### **3rd term**

1. Have knowledge of the basic principles of resuscitation measures.
2. Should have knowledge of benign and malignant gynaecological disorders.
3. Anaesthesiology related to Obstetrics & Gynaecology.
4. Knowledge about diagnosis and management of High risk pregnancy.
5. Knowledge about basic ultrasound in Obstetrics and Gynecology.
6. Knowledge about normal labour and its management.
7. Basic knowledge about diagnostic endoscopic procedures in Obstetrics and Gynecology.
8. Should have knowledge on genetics as applicable to Obstetrics.
9. Should have knowledge on care of postmenopausal women and geriatric Gynaecology.
10. Should have knowledge of basic newborn care.
11. Knowledge of pharmacotherapy in Obstetrics and Gynecology.
12. Should have knowledge about Paediatric Gynaecology.
13. The post graduate student should be aware of the relevant strategies to ensure confidentiality .
14. Knowledge of pre operative workup and perioperative care for common Obstetrics and Gynecology procedures.
15. Education regarding rights and confidentiality of women's health, specifically related to reproductive function, sexuality, contraception and safe abortion.
16. Plan and carry out scientific research (clinical / experimental) in the specialty of Obstetrics & Gynecology.
17. Understand the principles of adult teaching and should be able to teach common practical procedures in Obstetrics and Gynaecology and involved in educational programme in Obstetrics and Gynaecology for medical and paramedical staff.
18. Knowledge of steps taken in the event of death of a patient.

#### **4th term**

1. Knowledge on Gynaecological Endocrinology and infertility.
2. Knowledge of common complications in Obstetrics and Gynecology- Diagnosis and Management.
3. Knowledge about complications following common Obstetric procedures.
4. Epidemiology of RTI and HIV infection in Indian women of reproductive age group.
5. Cause, effect and management of these infections ,HIV infections in pregnancy, its effects and management.
6. Relationship of RTI and HIV with gynaecological disorders.
7. Shall provide counselling and delivery of fertility regulation methods and perform medical termination of pregnancy.
8. Knowledge and correct application of various Acts and Laws while practicing Obstetrics and Gynaecology, particularly MTP Act and sterilization, Preconception and P.N.D.T. Act.
9. Diagnosis and Management of common puerperal complications.
10. Knowledge about Normal and Abnormal puberty.
11. Knowledge about Obstetric referrals.
12. Understand quality improvement and management and how to perform, interpret and use of clinical audit cycles and the production and application of clinical standards, guidelines and protocols.
13. Planning and implementation of preventive strategies to reduce maternal and perinatal mortality and morbidity.
14. Understands the difference between audit and research and how to plan a research project and demonstrate the skills to critically appraise scientific data and literature

### **5th term**

1. Is aware of the contemporary advances and developments in medical sciences as related to Obstetrics and Gynaecology.
2. The post graduate student should demonstrate a working knowledge of the principles of risk management and their relationship to clinical governance and compliant procedures.
3. Should be acquainted with all recent advances in Obstetrics and Gynaecology and practice evidence based medicine.
4. Should have knowledge to manage geriatric problems.
5. Knowledge of steps recommended for examination and management of rape cases.
6. Knowledge of steps recommended for examination and management of medico legal cases of POCSO/child sexual abuse.
7. Knowledge of management of high risk obstetric cases including interdisciplinary management.
8. Knowledge of management of operative complications in Obstetrics and Gynecology.
9. Knowledge about common Uro-gynecological problems- Diagnosis and Management.
10. Knowledge of various Artificial Reproductive Technology procedures and their application.
11. Knowledge of imaging modalities in Obstetrics and Gynecology and their interpretation.
12. Knowledge of Screening procedures for gynecological malignancies and tumor markers
13. Knowledge about Diagnosis of gynecological malignancies.
14. Knowledge about common neonatal problems and management.
15. Learn methods for data handling, statistics presentation in scientific committees, seminars and research methodology and publications.
16. Acquire a full understating of all common usage of computing systems including the principles of data collection, storage, retrieval, analysis and presentation.

**6th term**

1. Has acquired skills in educating medical and paramedical professionals.
2. The post graduate student should understand the principles and legal issues surrounding informed consent with particular awareness of the implication for the unborn child, postmortem examinations and consents related to surgical procedures including tubal ligation/vasectomy, parental consent and medical certification, research and teaching and properly maintain medical records.
3. Should be able to teach common practical procedures in Obstetrics and Gynaecology and involved in educational programme in Obstetrics and Gynecology for medical and paramedical staff.
4. Shall be aware of the contemporary advances and developments in medical sciences as related to Obstetrics and Gynecology.
5. Knowledge about management of gynecological malignancies.
6. Knowledge about critical care in Obstetrics.
7. Knowledge about management of complications of labour and delivery.
8. The post graduate student should demonstrate a working knowledge of the principles of risk management and their relationship to clinical governance.

**B. AFFECTIVE DOMAIN****First term:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealing with patients, their relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Provide care to all women irrespective of the social, economic, caste and creed or religion.

**Second term:**

1. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
2. Should follow ethical practices in research/avoid plagiarism.

**Third term:**

1. Be humble and accept the limitations in his knowledge and skills and to ask for help from colleagues when needed.
2. Provide counselling and delivery of fertility regulation methods including reversible and irreversible contraception and emergency contraception.
3. Provide pre-conceptional counseling for eligible couples.

**Fourth term:**

1. To respect the rights of patients including right to information and second opinion.
2. Provide counseling regarding prevention of gynecological infection.
3. Apply high moral and ethical standards while carrying out human or animal research.

**Fifth term:**

1. Counseling regarding prevention, management and prognosis of gynecological malignancies.
2. Develop communication skills to word reports and professional opinion.
3. Provide leadership and get the best out of his team in a congenial working atmosphere.
4. Carry out proper procedure for pre-operative consent.
5. Should communicate with patient and relatives about any complications with empathy and honesty.

**Sixth term:**

1. Should be able to interact with patients, peers and paramedical staff and involvement in teaching of junior colleagues and interns.
2. Should be able to practice in community with ethics, attitude of professionalism and good communication skills (AETCOM).
3. Should follow the various laws like MTP ACT, PCPNDT, POSCO ACT while practicing in community as and when applicable
4. Should be able to participate in national health programs and provide service to community.
5. Should maintain correct records of all medico legal cases as per law.

**C. PSYCHOMOTOR DOMAIN**

- Shall develop adequate surgical skills to manage common obstetrical & gynecological problems.(in graded manner - assisting, operating with senior person assisting, operating under supervision)
- Adequate proficiency in common minor and major operations and management of their complications.
- Shall provide effective & adequate obstetric care including emergencies and immediate management of the newborn.
- Shall develop adequate skills to perform and interpret basic obstetrical and gynecological

ultrasonography.

OBSTETRICS				
	OBSERVED (O)	ASSISTED (A)	OPERATED WITH ASSISTANCE (OA)	PERFORMED INDEPENDENTLY (PI)
1 <sup>st</sup> TERM	<ul style="list-style-type: none"> <li>General physical Examination</li> <li>Antenatal examination</li> <li>Weight record in pregnancy</li> <li>Urine pregnancy test</li> <li>PS/ PV Examination</li> <li>Examination of placenta and membranes</li> <li>Examination of breast</li> <li>Interpretation of laboratory investigations in pregnancy</li> <li>Interpretation of serum beta HCG report</li> <li>Episiotomy</li> <li>Conduct of normal vaginal delivery</li> <li>Lower segment cesarean section</li> <li>Post-natal case examination</li> <li>Management of normal post-natal women</li> <li>Wound care (LSCS and episiotomy)</li> <li>Bladder catheterization under aseptic precautions</li> <li>Perform NST/CTG</li> <li>Parenteral iron administration</li> </ul>	<ul style="list-style-type: none"> <li>Antenatal examination</li> <li>PS/ PV Examination</li> <li>Urine pregnancy test</li> <li>Examination of placenta and membranes</li> <li>Examination of breast</li> <li>Interpretation of laboratory investigations in pregnancy</li> <li>Interpretation of serum beta HCG report</li> <li>Episiotomy</li> <li>Conduct of normal vaginal delivery</li> <li>Lower segment cesarean section</li> <li>Post-natal case examination</li> <li>Management of normal post-natal women</li> <li>Wound care (LSCS and episiotomy)</li> <li>Bladder catheterization under aseptic precautions</li> <li>Perform NST/CTG</li> <li>Parenteral iron administration</li> </ul>	<ul style="list-style-type: none"> <li>Antenatal examination</li> <li>PS/ PV Examination</li> <li>Weight record in pregnancy</li> <li>Urine pregnancy test</li> <li>Urine pregnancy test</li> <li>Examination of placenta and membranes</li> <li>Examination of breast</li> <li>Examination of breast</li> <li>Interpretation of laboratory investigations in pregnancy</li> <li>Interpretation of serum beta HCG report</li> <li>Episiotomy</li> <li>Conduct of normal vaginal delivery</li> <li>Examination</li> <li>Conduct of normal vaginal delivery</li> <li>Post-natal case examination</li> <li>Management of normal post-natal women</li> <li>Wound care (LSCS and episiotomy)</li> <li>Bladder catheterization under aseptic precautions</li> <li>Parenteral iron administration</li> </ul>	<ul style="list-style-type: none"> <li>Antenatal examination</li> <li>Weight record in pregnancy</li> <li>Urine pregnancy test</li> <li>Examination of placenta and membranes</li> <li>Examination of breast</li> <li>Episiotomy</li> <li>Conduct of normal vaginal delivery</li> <li>Post-natal case examination</li> <li>Management of normal post-natal women</li> <li>Wound care (LSCS and episiotomy)</li> <li>Bladder catheterization under aseptic precautions</li> <li>Parenteral iron administration</li> </ul>



<b>2<sup>ND</sup> TERM</b>	<ul style="list-style-type: none"> <li>• Diagnosis of normal and abnormal labour</li> <li>• Ventouse delivery</li> <li>• Manual replacement of placenta</li> <li>• Plotting of LCG Partogram</li> <li>• Interpretation of NST/ CTG trace</li> <li>• Opening and closing of abdomen</li> <li>• Intracervical cerviprime gel insertion</li> <li>• Vaginal insertion of Misoprostol</li> <li>• Neonatal resuscitation</li> <li>• Documentation of MTP forms, Sterilization forms, OT notes and consents</li> <li>• Artificial rupture of membranes.</li> </ul>	<ul style="list-style-type: none"> <li>• Diagnosis of normal and abnormal labour</li> <li>• LSCS</li> <li>• Ventouse delivery</li> <li>• Manual replacement of placenta</li> <li>• Plotting of LCG Partogram</li> <li>• Interpretation of NST/ CTG trace</li> <li>• Opening and closing of abdomen</li> <li>• Intracervical cerviprime gel insertion</li> <li>• Vaginal insertion of Misoprostol</li> <li>• Neonatal resuscitation</li> <li>• Documentation of MTP forms, Sterilization forms, OT notes and consents</li> <li>• Conduct of vaginal delivery (10)</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting of LCG Partogram</li> <li>• Interpretation of NST/ CTG trace</li> <li>• Intracervical cerviprime gel insertion</li> <li>• Vaginal insertion of Misoprostol</li> <li>• Documentation of MTP forms, Sterilization forms, OT notes and consents</li> <li>• Conduct of vaginal delivery- (10)</li> </ul>	<ul style="list-style-type: none"> <li>• Plotting of LCG Partogram</li> <li>• Interpretation of NST/ CTG trace</li> <li>• Intracervical cerviprime gel insertion</li> <li>• Vaginal insertion of Misoprostol</li> <li>• Documentation of MTP forms, Sterilization forms, OT notes and consents</li> <li>• Conduct of vaginal delivery (5)</li> </ul>
<b>3<sup>RD</sup> TERM</b>	<ul style="list-style-type: none"> <li>• Amniocentesis, fetal reduction</li> <li>• MTP (1<sup>st</sup> and 2<sup>nd</sup> trimester)</li> <li>• Dilatation and evacuation, suction and evacuation</li> <li>• Laparotomy and laparoscopic management of ectopic pregnancy</li> <li>• Application of forceps</li> <li>• PPIUCD insertion</li> <li>• Management of Shock in obstetrics</li> <li>• Postpartum sterilization</li> <li>• Obstetric ultrasound (Dating, anomaly and Growth scan)</li> </ul>	<ul style="list-style-type: none"> <li>• Amniocentesis</li> <li>• MTP (1<sup>st</sup> and 2<sup>nd</sup> trimester)</li> <li>• Dilatation and evacuation, suction and evacuation</li> <li>• Laparotomy and laparoscopic management of ectopic pregnancy</li> <li>• Application of forceps</li> <li>• PPIUCD insertion</li> <li>• Management of Shock in obstetrics</li> <li>• Postpartum sterilization</li> </ul>	<ul style="list-style-type: none"> <li>• Lower segment cesarean section</li> <li>• Ventouse delivery</li> <li>• PPIUCD insertion</li> </ul>	<ul style="list-style-type: none"> <li>• PPIUCD insertion</li> <li>• Opening and closing of abdomen</li> <li>• Artificial rupture of membranes</li> </ul>

<b>4<sup>TH</sup> TERM</b>	<ul style="list-style-type: none"> <li>Amnioreduction</li> <li>Eclampsia drill</li> <li>Postpartum hemorrhage (PPH) drill</li> <li>Cervical tear repair</li> <li>Balloon tamponade for PPH</li> <li>External cephalic version</li> <li>Extra-amniotic saline instillation</li> <li>Intracervical foleys insertion</li> <li>High risk obstetric ultrasound and NT scan, Second level scans, fetal Echocardiography</li> <li>Interpretation of growth scans</li> <li>Assisted vaginal breech delivery</li> </ul>	<ul style="list-style-type: none"> <li>Cervical tear repair</li> <li>Balloon tamponade for PPH</li> <li>External cephalic version</li> <li>Extra-amniotic saline instillation</li> <li>Intracervical foleys insertion</li> <li>High risk obstetric ultrasound and NT scan, Second level scans, fetal Echocardiography</li> <li>Interpretation of growth scans</li> <li>Assisted vaginal breech delivery</li> </ul>	<ul style="list-style-type: none"> <li>PPIUCD insertion</li> <li>Extra-amniotic saline instillation</li> <li>Intracervical foleys insertion</li> <li>Postpartum sterilization</li> <li>Assisted vaginal breech delivery</li> <li>LSCS (5)</li> </ul>	<ul style="list-style-type: none"> <li>Eclampsia drill (in simulated environment)</li> <li>Postpartum hemorrhage drill (in simulated environment)</li> <li>Assisted vaginal breech delivery (in simulated environment)</li> <li>Conduct of vaginal delivery (10)</li> </ul>
<b>5<sup>th</sup> TERM</b>	<ul style="list-style-type: none"> <li>Conservative surgeries for postpartum hemorrhage</li> <li>Surgical management of scar ectopic pregnancy</li> <li>Surgical management of acute uterine inversion</li> <li>Management of shoulder dystocia</li> </ul>	<ul style="list-style-type: none"> <li>Conservative surgeries for postpartum hemorrhage</li> <li>Surgical management of scar ectopic pregnancy</li> <li>Surgical management of acute uterine inversion</li> </ul>	<ul style="list-style-type: none"> <li>MTP (1<sup>st</sup> and 2<sup>nd</sup> trimester)</li> <li>Application of forceps</li> <li>Cervical tear repair</li> <li>Management of shoulder dystocia</li> </ul>	<ul style="list-style-type: none"> <li>PPIUCD insertion</li> <li>Postpartum sterilization</li> </ul>
<b>6<sup>th</sup> TERM</b>	<ul style="list-style-type: none"> <li>Cesarean hysterectomy, internal iliac artery ligation</li> <li>Surgical management of placenta accreta</li> </ul>	<ul style="list-style-type: none"> <li>Cesarean hysterectomy, internal iliac artery ligation</li> <li>Surgical management of placenta accreta</li> </ul>		<ul style="list-style-type: none"> <li>Lower segment cesarean section (10)</li> <li>Conduct of Vaginal delivery (20)</li> </ul>
	<b>OBSERVED (O)</b>	<b>ASSISTED (A)</b>	<b>OPERATED WITH ASSISTANCE (OA)</b>	<b>PERFORMED INDEPENDENT LY (PI)</b>
<b>1<sup>st</sup> TERM</b>	<ul style="list-style-type: none"> <li>Endometrial biopsy.</li> <li>Dilatation and curettage</li> </ul>	<ul style="list-style-type: none"> <li>Gynecological examination (P/S, P/V)</li> <li>Pap smear</li> </ul>	<ul style="list-style-type: none"> <li>VIA, PAP smear (min 10)</li> </ul>	<ul style="list-style-type: none"> <li>Gynecological examination (P/S, P/V)</li> </ul>

<b>2<sup>ND</sup> TERM</b>	<ul style="list-style-type: none"> <li>• Culdocentesis</li> <li>• Opening and closing of abdomen</li> <li>• Pelvic ultrasound.</li> <li>• Endoscopy (hysteroscopy and laparoscopy)</li> <li>• Tubectomy, Vasectomy</li> </ul>	<ul style="list-style-type: none"> <li>• Colposcopy</li> <li>• Cervical biopsy</li> <li>• Endometrial biopsy</li> </ul>	<ul style="list-style-type: none"> <li>• Closure of abdomen (min 10 cases)</li> </ul>	<ul style="list-style-type: none"> <li>• PAP smear- VIA, VILI (min 10)</li> <li>• Clinical diagnosis of STD</li> </ul>
<b>3<sup>rd</sup> TERM</b>	<ul style="list-style-type: none"> <li>• Operations for pelvic organ prolapse</li> <li>• Vaginal and abdominal hysterectomy.</li> <li>• Interpretation of semen analysis report.</li> <li>• Dilatation and curettage</li> <li>• Hysterosalpingography</li> <li>• Cu-T insertion</li> <li>• Post coital test</li> </ul>	<ul style="list-style-type: none"> <li>• Operation of hysterolaparoscopy.</li> <li>• Vaginal hysterectomy.</li> <li>• Dilatation and curettage</li> <li>• Tubectomy</li> </ul>	<ul style="list-style-type: none"> <li>• Opening and closing of Abdomen</li> <li>• Endometrial biopsy</li> </ul>	<ul style="list-style-type: none"> <li>• Examination of prolapse Pelvic organ prolapse Quantification system (POP-Q)</li> <li>• Vaginal swabs</li> <li>• Cervical swab</li> </ul>
<b>4<sup>th</sup> TERM</b>	<ul style="list-style-type: none"> <li>• Observed benign Ovarian cyst operation</li> <li>• ART techniques- IUI, IVF.</li> <li>• Conization, cryotherapy, LEEP</li> <li>• Abdominal hysterectomy</li> <li>• Ovarian cyst operations</li> <li>• Myomectomy, polypectomy</li> <li>• Cu-T insertion</li> <li>• Hysteroscopy guided biopsy</li> </ul>	<ul style="list-style-type: none"> <li>• Laparoscopy</li> <li>• Hysteroscopy</li> <li>• Abdominal hysterectomy.</li> <li>• Cu-T insertion</li> <li>• Colposcopy</li> </ul>	<ul style="list-style-type: none"> <li>• Cervical biopsy</li> <li>• Dilatation and curettage.</li> <li>• Fractional curettage</li> <li>• Tubectomy</li> </ul>	<ul style="list-style-type: none"> <li>• Cu-T insertion</li> </ul>
<b>5<sup>th</sup> TERM</b>	<ul style="list-style-type: none"> <li>• Surgical management of gynecological malignancies (Exploratory laparotomy for ovarian tumor, radical hysterectomy for gynecological malignancies)</li> <li>• Surgical management of stress urinary incontinence.</li> </ul>	<ul style="list-style-type: none"> <li>• Surgical management of gynecological malignancies (Exploratory laparotomy for ovarian tumor, radical hysterectomy for gynecological malignancies)</li> <li>• Surgical management of stress urinary incontinence.</li> </ul>	<ul style="list-style-type: none"> <li>• Endometrial</li> <li>• Tubectomy</li> <li>• Abdominal hysterectomy</li> <li>• Vaginal hysterectomy</li> <li>• Endosuturing and laparoscopic port insertion (in simulated environment)</li> </ul>	<ul style="list-style-type: none"> <li>• Cu-T insertion.</li> <li>• Dilatation and curettage.</li> <li>• cervical biopsy</li> </ul>

<b>6<sup>th</sup> TERM</b>	<ul style="list-style-type: none"> <li>• Surgical management of genital fistulae.</li> <li>• Micro-tubal surgeries.</li> <li>• Interpretation of CT and MRI images.</li> <li>• Diagnostic laparoscopy, Laproscopic salpingectomy, Laproscopic ovariectomy, Laproscopic management of endometriotic cyst, Laproscopic myomectomy, Total laparoscopic hysterectomy, Hysteroscopic removal of CU-T, Hysteroscopic resection of septum, Hysteroscopic polypectomy, Hysteroscopic cornual cannulation.</li> <li>• Fertility preserving surgeries</li> </ul>	<ul style="list-style-type: none"> <li>• Micro tubal surgery Repair of fistula</li> <li>• Myomectomy</li> <li>• Diagnostic laparoscopy, Laproscopic salpingectomy, Laproscopic ovariectomy, Laproscopic management of endometriotic cyst, Laproscopic myomectomy, Total laparoscopic hysterectomy, Hysteroscopic removal of CU-T, Hysteroscopic resection of septum, Hysteroscopic polypectomy, Hysteroscopic cornual cannulation.</li> <li>• Fertility preserving surgeries</li> </ul>	<ul style="list-style-type: none"> <li>• Abdominal hysterectomy (2)</li> <li>• Vaginal hysterectomy (2)</li> <li>• Endosuturing and laparoscopic port insertion (in simulated environment)</li> </ul>	<ul style="list-style-type: none"> <li>• Interval Tubectomy</li> </ul>
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\* **Note- Number of common procedures to be performed as per NMC Guidelines**

## VI. TEACHING AND LEARNING ACTIVITIES:

### THEORETICAL TEACHING:

1. **Lectures:** Lectures are to be conducted once a week. Lectures may be didactic or integrated.
2. **Journal Club:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book the relevant details. The presentations would be evaluated using checklist and would carry weightage for internal assessment. A time table with names of the students and the moderator should be announced in advance.
3. **Subject Seminar:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the subject with names of the students and the moderator should be announced in advance.
4. **Case Discussion:** Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in the Log Book relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable for the case presentation with names of the students should be announced in advance.
5. **Practical and Clinical Learning:** Ward rounds may be service or teaching rounds.
  - a) Service Rounds: Postgraduate students should do service rounds every day for the care of

the patients. Newly admitted patients should be worked up by the post graduate student and presented to the faculty members the following day.

- b) Teaching Rounds: Every unit should have 'grand rounds' for teaching purpose at the bed side. A diary should be maintained for day-to-day activities by the post-graduate students. Entries of (a) and (b) should be made in the Log book.
- c) Self-Directed Learning (SDL): SDL sessions are to be conducted. All the PG's are expected to participate in SDL teaching. The evaluation will be done based on the check list and carry weightage for the internal assessment.
- d) Small group discussions (SGD): Case based small group discussions will be carried out once a week.
- e) Skill lab sessions: Simulation based skill lab training will be conducted once a month for all the post graduate students. Basic obstetric case scenario, suturing techniques, endoscopic procedures, obstetric drills sessions will be held. Evaluation will be conducted for each skill lab session.

**6. Inter Departmental Meetings and Clinicopathological conference:** Strongly recommended particularly with departments of Pathology, Pediatrics and Radio- Diagnosis at least once a month. These meetings should be attended by post- graduate students and relevant entries must be made in the Log Book.

- a) Pathology: Interesting cases shall be chosen and presented by the post- graduate students and discussed by them as well as the senior staff of pathology department. The staff of pathology department would then show the slides and present final diagnosis. In the sessions the advanced immuno- histo-chemical techniques, the newer biomarkers, other recent developments can be discussed.
- b) Paediatrics: Perinatal mortality meetings will be held once in a month along with Paediatrics staff.
- c) Radio-diagnosis: Interesting cases and the imaging modalities should be discussed. Emphasis should be given for the radiological differential diagnosis.

**7. Mortality Meeting:** The mortality meeting should be conducted in the department whenever there is mortality. The post graduate student should prepare the details regarding the cause of death after going through the case records in detail, and should present during the mortality meeting. The death records will be discussed in detail during this meeting.

**8. Teaching Skills:** Post-graduate students must teach undergraduate students( eg. Medical, Nursing) and interns by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by medical faculty as well as by the students. Record of their participation is to be kept in Log Book. Training of Postgraduate students in Educational Science and Technology is recommended.

**9. District residency programme:** Postgraduates should undergo a compulsory residential rotation of 3 months in district hospital or district health system as a part of the course curriculum. Such rotations shall takes place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of post graduate programme. (NMC guidelines). The clinical responsibilities assigned to the Residents would include serving in outpatient, inpatient, casualty, and other areas pertaining to the Speciality and encompass night duties and labour room duties. Quality of training shall be monitored by log books, supportive supervision, and continuous assessment of performance. The attendance and performance of District Residents shall be tracked by the District Residency Programme Coordinator (DRPC) of the district concerned, as well as the parent Medical College through an appropriate electronic/digital or mobile enabled system. The District Residents would remain in contact with their designated post-graduate teachers and departments at their parent Medical College / Institution by phone and e-communication for guidance, learning, and for being able to participate remotely in scheduled case discussions, seminars, journal clubs, thesis discussion, etc. and other academic activities.

10. **Course in Ethics** - All post-graduate students shall complete course in ethics including Good Clinical Practices , to be conducted by institutions/University. The students are expected to complete the course in the first year.
11. **Course in Cardiac Life Support Skills** - All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institution. The students are expected to complete the course in the first year.
12. **Continuing Medical Education Programmes (CME):** Recommended that at least state level CME pogrammes should be attended by each student during the course.
13. **Conferences:** Post-graduate student should attend one national and one state level conference during the course. A post graduate student would be required to present one poster, to read one paper at a national level or state conference and to present one research paper, this should be accepted for publication or sent for publication during the period of post graduate course so as to make eligible to appear post graduate degree examination.
14. **Research Activities:** The Post-graduate students to be encouraged to carry out research activities in the department, institution and or community and it is desirable to present/ publish their research work.
15. **SWAYAM NPTEL course:** Postgraduate students should complete **basic course in biomedical research** by enrolling to SWAYAM NPTEL course during their postgraduation. It is mandatory to clear NPTEL exam before appearing for the final exam.
16. **e-Learning Activites: Department will encourage E-learning activities.**
17. **Orientation classes for new postgraduate students:**
  - a) Standardized Case Paper Writing.
  - b) Conduct of normal labour.
  - c) AMTSL.
  - d) Intranatal care.
  - e) Complications of labor.
  - f) Diagnosis and management of fetal distress.
  - g) Operative deliveries.
  - h) Obstetric emergencies.
  - i) Episiotomy repair.
  - j) BLS training programme.
  - k) New born care.
  - l) Critical care and ICU management

### **ROTATION:**

<b>1. Rotation postings in OBG sub specialities:</b> Ultrasonography Assisted Reproductive Centre Preventive Gynaec-Oncology Posting in Cancer Hospital on Rotation	4 weeks 4 weeks 2 weeks 2 weeks
<b>2. Ancillary Postings:</b> Neonatology Anesthesiology	2 weeks 1 week

### **WRITING CLINICAL NOTES REGULARLY AND MAINTAINS RECORDS:**

- I term- working under supervision of senior residents and teaching faculty.
- II & III term- Besides patient care in O.P.D., wards, Casualty and labor room, carrying out minor operations under supervision and assisting in major operation.
- IV, V & VI term- management of patient including major operations under supervision of teaching faculty. Surgeries to be done during PG training. (Details in the Syllabus)  
(During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratory is being made available.)

## **ASSESSMENT**

### **1. Formative Assessment (Internal evaluation):**

**Formative Assessment (examination) shall consist of Theory, Clinical/Practical and Viva Voce.** During the course of three years, the department will conduct quarterly assessment every 4 months. The last test will be a Preliminary examination which may be held three months before the final examination. The tests include the written papers, practicals / clinicals and viva-voce. Records and marks obtained in such tests will be maintained by the Head of the department and will be sent to the University when called for.

Results of all evaluations should be entered into P.G's logbook/diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

### **2. Summative Assessment:**

**At the end of training it would be carried out by KAHER as per rules given in the Postgraduate Medical Education Regulation 2023.**

Other criteria to be fulfilled for the degree course

## **VII. Eligibility Criteria to be fulfilled for appearing in University examination for the degree course:**

- 1. Minimum of one Poster or Podium presentation** at a National/Zonal/State conference of his/her speciality;
- 2. Have one research paper published/accepted for publication in journal of his/her speciality as first author**
- 3. Course in Research Methodology** - All post-graduate students shall complete an online course in Research Methodology i.e. NPTEL. The students are expected to complete the course in the first year. The online certificate generated on successful completion of the course and examination thereafter, will be acceptable evidence of having completed this course. It should be submitted on successful completion of course and examination.  
The above certification shall be a mandatory requirement to be eligible to appear for the final examination of the respective post-graduate course.
- 4. Course in Ethics** - All post-graduate students shall complete course in ethics including Good Clinical Practices, to be conducted by institutions/Universities. The students are expected to complete the course in the first year. No post-graduate student shall be permitted to appear in the examination without the above certification.
- 5. Course in Cardiac Life Support Skills** - All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be



conducted by the institution. The students are expected to complete the course in the first year. No post-graduate student shall be permitted to appear in the examination without the above certification.

6. **Maintenance of Log Book:** Every candidate shall maintain a dynamic e-Log book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Logbook and it should be verified and signed by the faculty member. It shall be submitted to post graduate guide to assess and authenticate monthly record (e-Log) books. The Log book shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the University practical/ clinical examination. Special Mention of ARC and Ultrasound Posting.
7. **Dissertation:** Every candidate pursuing MS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such work shall be submitted in the form of a dissertation, at least 6 months before the theory and practical examination. Thesis shall be evaluated by both external and internal examiners who shall not be examiners for theory and practical examination. For details regarding Dissertation: Refer 9.1 to 9.10 of Chapter-I.

**Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory, dissertation is accepted and eligibility criteria is fulfilled to appear for summative assessment.**

## **VIII. SCHEME OF EXAMINATION:**

1. **Theory examination** for summative examination shall be of four theory papers.
2. **Clinical/Practical and viva voce :** Clinical examination for the subjects in clinical sciences shall be conducted to test the knowledge and competence of the candidates for undertaking independent work as a consultant/specialist/teacher, for which candidates shall be examined for one long case and two short cases.
3. **The viva voce examination** shall be thorough and shall aim at assessing the candidate's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the Speciality.
4. Clinical/practical examination shall include **Objective Structured Clinical Examination (OSCE).**

### **Theory: 400 Marks**

There shall be four papers, each of three hours duration. Total marks of each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below. Obtaining a minimum of 50% in theory as well as practical separately shall be mandatory for passing the examination.

PAPER I	<b>Applied Basic Sciences</b>	10 questions of 10 marks each= 100marks
PAPER II	<b>Obstetrics including social obstetrics and diseases of newborn</b>	10 questions of 10 marks each= 100marks
PAPER III	<b>Gynaecology including fertility regulation</b>	10 questions of 10 marks each= 100marks
PAPER IV	<b>Recent Advances in Obstetrics and Gynecology</b>	10 questions of 10 marks each= 100marks

**Note: The distribution of chapters or topics shown against the papers are suggestive only and may overlap or change.**

### **Clinical Examination: 300Marks**

<b>PRACTICALS</b>	<b>300</b>
Dissertation	20
OSCE	30 (5 station X 6 marks)
Long case(one obstetrics & One gyn	2 X 80
Short case(one obstetrics & One gyn	2 X 45
<b>VIVA</b>	<b>100</b>

### **Viva -Voce Examination: 100 Marks (80+20)**

**(Aims: To elicit candidate's knowledge and investigative/ therapeutic skills)**

#### **1] Viva voce Examination [80 Marks]**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition candidates may be given case reports, charts, gross specimens, histo – pathology slides, X - ray, ultrasound, CT scan images, etc... for interpretation. Questions on operative surgery will be asked. Students knowledge on the use of instruments, family planning and drugs pertaining to the subject will also be evaluated during viva – voce examination.

#### **2] Dissertation [20 marks]:**

It will be assessed by the external examiner.

### **MAXIMUM MARKS:**

Maximum Marks for Degree in Obstetrics & Gynecology	Theory	Practical	Viva -Voce & dissertation	Grand Total
	400	300	100	800

**PASSING CRITERIA:**

The candidate shall secure not less than 50% marks in each head of passing which shall include

1. Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)
2. Practical/Clinical and Viva voce - aggregate 50%
3. If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.
4. Five per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks.
5. No grace mark is permitted in post-graduate examination either for theory or for practical.

## VII. RECOMMENDED BOOKS (LATEST EDITIONS)

SL No	Name of the text book	Authors	Publications	Edition
1	Practical obstetrics problems	Ian Donald Editor-Renu Misra	B. I. Publications	8 <sup>th</sup>
2	Practical guide to high risk pregnancy & delivery	Editors-Femando Arias, Shirish. N. Daftary, Amamath. G.Bhide	Elsevier's publications	5 <sup>th</sup>
3	Text book of Obstetrics	William's	McGraw Hill publications BIP publications	26 <sup>th</sup>
4	Manual of Obstetrics	Holland	BIP Publications	4 <sup>th</sup>
5	Principles of Gynaecology	Jeffcoate's Editors-Pratap Kumar, Narendra Malhotra	Jaypee Publications	9 <sup>th</sup>
6	Textbook of Gynaecology	Shaw's	Elsevier's publications	18 <sup>th</sup>
7	Textbook of Gynaecology	Dutta	Central publications	9 <sup>th</sup>
8	Textbook of obstetrics	Dutta	Central publications	10 <sup>th</sup>
9	Practical Gynaecology & obstetrics	Parulekar	Vora publications	6 <sup>th</sup>
10	Operative Gynaecology	Munroker's	A.T.B.S. publications	13 <sup>th</sup>
11	Textbook of operative gynaecology	Shaws	Churchill Livingstone (Elsevier publications)	7 <sup>th</sup>
12	Operative Gynaecology	Te Linde's	Lippincott Williams and Wilkins Publication	13 <sup>th</sup>
13	Medical disorders during pregnancy	Michael De Swett	Mosby Publication	5 <sup>th</sup>
14	Obotrites and Gynaecology	Rathnam	Universities press Limited	5 <sup>th</sup>
15	The management of Labour	Arulkumaran	Orient Longman Publications	3 <sup>rd</sup>
16	Clinical Gynaecology	Bhaskar Rao	Orient Longman Publications	5 <sup>th</sup>
17	Text book of Obstetrics & Neonatology	C.S.Dawn	Mannohill .Publications	
18	Text book of Obstetrics & contraception	C.S.Dawn	B.B. Publications	14 <sup>th</sup>
19	J.Studd	Progress in Obstetrics & Gynaecology	E- Aletsky's Publication	1 <sup>st</sup>
20	Padubidri	Text book of Obstetrics	Elsevier Publications	2 <sup>nd</sup>
21	Novak'S	Text book of Gynaecology	Lippincott Willams and Wilkins Publications	17 <sup>th</sup>
22	Dewhurst	Obstetrics and Gynaecology	Blackwell sciences Publications	9 <sup>th</sup>
23	Bonney's	Gynaecological surgery	Blackwell science	12 <sup>th</sup>

			Publication	
24	Callen	Ultrasonography	C.B.S Publications	6 <sup>th</sup>
25	D.K. James	High risk pregnancy management options	W.B. Saunders (Elsevier Publications Arya Publishing Company	5 <sup>th</sup>
26	J.B. Sharma	Text Book of Obstetrics		3 <sup>rd</sup>

#### VIII. RECOMMENDED JOURNAL 'S

S:NO	Name of the Journal.
1	Obstetrics and Gynecological survey.
2	Obstetrics and Gynecology clinics of North America
3	Clinical Obstetrics and Gynecology.
4	British journal of Obstetrics and Gynecology.
5	American Journal of Obstetrics and Gynecology.
6	Journal of Obstetrics and Gynecology.
7	Journal of Obstetrics and gynecology of India.
8	Indian journal of Obstetrics and Gynecology Research

## POST GRADUATE DEGREE COURSE MS IN OTORHINOLARYNGOLOGY AND HEAD AND NECK SURGERY.

### PREAMBLE:

The purpose of PG education is to create specialist who would provide high quality health care and advance the cause of science through research and training.

1. The purpose of MS ENT is to standardize Otorhinolaryngology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in postgraduate teaching as well as resultantly creating competent ENT surgeons with appropriate expertise.

### GOALS:

The goals of postgraduate training course would be to train a MBBS doctor who will

- Practice efficiently and effectively, backed by scientific knowledge and skill base with sufficient understanding of basic sciences, recent advances and clinical applications related to the specialty to be able to integrate this knowledge into clinical practice.
- Practice Evidence Based Medicine (EBM) in the field of Otorhinolaryngology.
- Exercise empathy and caring attitude and maintain high ethical standards.
- Practice his specialty ethically, keeping in mind the requirement of the patient, community and people at large.
- Plan and advice measures for the promotive, preventive, curative and rehabilitative aspects of health and diseases in the specialty of ENT.
- Should be able to demonstrate his cognitive skills in the field of ENT and its ancillary branches during the formative and summative evaluation process.
- Play the assigned role in implementation of National Health Programs.
- Continue to evince keen interest in continuing education in the specialty irrespective of whether he / she is in a teaching institution or is a practicing surgeon.
- Demonstrate competence in basic concepts of research methodology and writing thesis and research papers.
- Be a motivated 'teacher' - defined as a specialist keen to share his/her knowledge and skills with colleague or a junior or any learner.

## II . OBJECTIVES:

### Knowledge:

- Demonstrate adequate understanding of knowledge pertaining to his/her specialty including basic science and recent advances. She/he should be fully conversant with bedside procedure (diagnostic and therapeutic) and having knowledge of latest diagnostics and therapeutics available.
- Describe etiology, pathophysiology, and principles of diagnosis and management of common problems including emergencies in children, adults and old.
- Describe indications and methods for fluid and electrolyte replacement therapy including blood transfusion.
- Describe common malignancies in the country and their management including prevention.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning therapeutic measures.
- Recognize conditions that maybe outside the area of his/her specialty/ competency and to refer them to proper specialist.
- Advice regarding operative or non-operative management of the case and the carry out his management effectively.
- Judicial use of available investigations.
- Update himself/herself by self-study and attending courses, conferences, symposia and seminars relevant to the specialty.
- Teach and guide his/her team, colleagues and other students.
- Undertake audit, use information technology tools and carry out research, both basic and clinical, with aim of publishing and presenting his/her work at various scientific forum.

### Skills:

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and relevant tests and interpret them to come to a reasonable diagnosis about the condition
- Perform common operative procedures in ENT and Head & Neck surgery.
- Provide basic and advanced lifesaving support services (BLS & ALS) in emergency situations.
- Undertake complete patient monitoring including the preoperative and postoperative care of the patient.
- Tracheostomy as a planned or emergency procedure.
- Percutaneous tracheostomy
- Practice post-tracheostomy care
- Intubation and Extubation skills

Human values, Ethical practice and Communication abilities:

- Adopt ethical principles in all aspects of his/her practice; professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or a religion of the patient.
- Develop communication skills, in particular the skill to explain various option available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standard while carrying out human or animal research.
- Be humble and accept the limitations in his/her knowledge and skills and to ask for help from colleagues when needed.
- Respect patients' rights and privileges including patients' right to information and right to seek second opinion.

Subject specific competencies

A. Cognitive Domain

At the end of training, the student should be able to demonstrate ability to practically apply knowledge gained during training period. This would include the following:

Basic Sciences related to Otolaryngology

- Physiology- Mechanism of perception of smell and taste, mechanism of breathing and voice production, lacrimation, deglutition and salivation. Functional tests of the nose and paranasal sinuses, mechanism of cough and sneezing.
- Physics of sound, theories of hearing, mechanism of perception of sound and speech production, physiology of equilibrium and cerebral function. Physiology of brain in connection with hearing, speech, smell and phonation. Audiologic tests like audiometry, impedance, evoked potentials, OAE, Speech audiometry.
- Physiology of larynx, tracheobronchial tree and esophagus - Histology of mucous membranes, internal ear and other associated organs and structures, nose, PNS, Nasopharynx, Larynx, Tracheo-Bronchial tree, Lymphoepithelial system.
- Mechanism of immune system/immunology and genetics.
- Anatomy-Embryogenesis of ear, nose and throat including palate and the larynx, Oesophagus, trachea and lungs, tongue, salivary gland Head and Neck



and skullbase etc.

- Parapharyngeal spaces in the neck including connective tissue barriers of larynx.
- Applied anatomy of the skull bones, accessory sinuses, external, middle and inner ear, nose, PNS, nasopharynx, meninges, brain, pharynx, larynx, trachea and bronchi, lungs, pleurae, oesophagus and the mediastinum.
- Anatomy of all cranial nerves with their functions.
- Principles and Practices of Otolaryngology, Audiology and Speech Pathology Clinical Methodology as applied to ORL HN diseases in adult and children and the accessory sinuses, diagnosis and surgical treatment of diseases of nose, throat and ear in adult and children.
- Prevention and treatment, infectious diseases of Otolaryngology and Head Neck region.
- Circulatory and nervous disturbances of the nose, throat and ear and their effects on other organs of the body.
- Deformities, injuries sinus infections, polyps and the tumors of the nose, and paranasal sinuses.
- Examination of the ear, deafness and allied diseases, complications of diseases of the ear.
- Injuries, tumors, nervous and circulatory neurological disturbances of the ear.
- Diagnosis and treatment of tinnitus and vertigo.
- Diagnosis and rehabilitation of the Hearing handicapped including, dispensing of hearing aid other vibrotactile aids. Surgical pathology of Otolaryngology and Head Neck region.
- Basic knowledge of anaesthesia as related to ENT.
- Examination of diseases of children (Paediatric ORL) in connection with throat and larynx. Neurological and vascular disturbances.
- Congenital and neonatal stridor.
- Pathology of various diseases of the larynx and throat, tracheobronchial tree and their causative organisms.
- Indications and various techniques of direct laryngoscopy, nasal endoscopy.
- Bronchoscopy and oesophagoscopy, including microlaryngoscopic procedures.
- Reading of radiograms, scans, audiograms, nystagmograms and tympanograms in connection with ENT diseases/disorders.
- Special apparatus for the diagnosis and treatment of the diseases of ear, nose and throat including audiometer, BERA, Speech analyser etc.

## Recent advances in Otolaryngology and Head Neck surgery

- Recent developments in the diagnosis, pathogenesis and treatment of the ENT diseases
- The knowledge of the frontiers of the oto-laryngology and lateral skull base surgery
- Rhinoplasty, endoscopic sinus surgery, and anterior cranial fossa surgery
- Knowledge of LASERS and fibre optics
- Other methods of managing Hearing loss
- Implantable hearing aids cochlear implants
- Phonosurgery
- Etiology and Managements of sleep apnoea/snoring
- Hypophysectomy and optic nerve decompressions
- Immunotherapy and modalities of the gene therapy
- Newer techniques for Radiotherapy including, use of gamma knife for treatment of Intracranial tumors and other malignancy
- Chemotherapy of cancer

## General Surgical Principles and Head-Neck Surgery

- General Surgery, Head and Neck oncology, and Medicine as applicable to the ENT disorders/diseases. Surgery of congenital deformities of nose, ear (Pinna) and trachea/oesophagus etc.
- Radiology, Imaging - computed tomography and magnetic resonance imaging, (MRI) and intervention radiology and angiography as related to ENT
- General Pathologic aspects such as wound healing and also pathology and pathogenesis of ENT diseases, Pharmacology, molecular biology, genetics, cytology, haematology, and immunology as applicable to otolaryngology
- General Principles of faciomaxillary traumatology and neck injury.
- Plastic Surgery as applicable to Otolaryngology.

## B. Affective Domain

- The student will show integrity, accountability, respect, compassion and dedicated patient care. The student will demonstrate a commitment to excellence and continuous professional development.
- The student should demonstrate a commitment to ethical principles relating to providing patient care, confidentiality of patient information and informed consent.
- The student should show sensitivity and responsiveness to patients' culture, age, gender and disabilities.
- The student should be able to choose the required investigations to enhance the attitude, communicative skills, including dealing with patient's relatives with the required empathy, adapt to changing trends in education, learning methods and evolving new diagnostic and therapeutic techniques in the subject of ENT.

## C. Psychomotor Domain

By the end of the training, a student should be able to demonstrate his skills in:

- Taking a good history and demonstrating good examination techniques.
- Arrive at a logical working diagnosis, differential diagnosis after clinical examination and order appropriate investigations keeping in mind their relevance (need based) and thereby provide appropriate care that is ethical, compassionate, responsive and cost effective and in conformation with statutory rules.
- Should be able to perform and demonstrate the practical skills in the field of ENT including the following:
  - Examination of the ear, nose and throat oral cavity examination
  - Clinico-physiological examination and evaluation of the audio-vestibulo neurological system
  - Examination of the larynx and the throat including flexible endoscopy, stroboscopy, voice analysis and the clinico-physiological examination of the speech
  - Examination of the otological and audiological system including Tuning fork testing, audiological evaluation, micro and otoendoscopy
  - Clinical and physiological evaluation of the nose and paranasal sinuses including nasal endoscopy and olfactory evaluation
  - Examination of the neck and its structures
- Should demonstrate and perform various therapeutic skills related to the specialty such as:
  - Tracheostomy

- Anterior/ posterior nasal packing
- Ear Packing and Syringing
- Foreign body removal from air nose and throat

### **III. COURSE CONTENT:**

#### **i) Theory**

##### **BASIC SCIENCES**

1. Anatomy and Physiology of Ear, Nose and Throat, Trachea and esophagus.
2. Anatomy of head & neck region including thyroid, neck spaces and salivary glands
3. Surgical anatomy of skull base/ cranial nerves
4. The generation and reception of speech
5. Radiographic anatomy of the ear, nose, throat and imaging including PET
6. Bacteriology in relation to Otorhinolaryngology
7. Allergy and rhinitis
8. Haematology in relation to Otolaryngology
9. Anaesthesia for Otolaryngology
10. Pharmacology of drugs used in ENT
11. Electrolyte, fluid balance/shock conditions: Physiology of circulation, regulation of blood pressure, reactions of body to haemorrhage, patho-physiology of shock, fluidbalance, blood transfusion and its hazards, fluid replacement therapy, burns.
12. Agents used in shock like states
13. Use of teaching aids
14. Routine blood, urine testing
15. Preparation of slides
16. Facial nerve stimulation test.
17. Evoked response audiometry.
18. Radiotherapy and chemotherapy in head & neck cancers
19. Wound healing/ principles of laser surgery
20. Intensive care in relation to ENT and head & neck

21. Navigational System and Robotic Surgeries in ENT, Sialoendoscopy, Voice disorders and Voice Clinic
22. The ears and nasal sinuses in the aerospace environment
23. Physiological consideration of pressure effects on the ear and sinuses in deep water diving
24. The principles of cancer immunology with particular reference to head and neck cancer.
25. Recording of nystagmus by ENG and its interpretation.

#### Audiology Clinic

(A)	(B)	(C)
a) Brief knowledge of acoustics	1) Epidemiology/ Prevention/ rehabilitation of balance & hearing disorders	1) Diagnostic audiometry, <ul style="list-style-type: none"> <li>• Pure tone Audiometry,</li> <li>• Impedance Audiometry,</li> <li>• Free field Audiometry,</li> <li>• Specialized tests of hearing including SISI,</li> <li>• Tone decay,</li> <li>• ABLB,</li> <li>• Speech discrimination score etc.</li> </ul>
b) Use of computers in audiology and vestibular testing and rehabilitation	2) Hearing aids	2) Diagnostic testing of vestibular system <ul style="list-style-type: none"> <li>• caloric testing (Water and Air) stopping test,</li> <li>• Fukuda's test,</li> <li>• VENG</li> </ul>
	3) Cochlear	

,

	implants	
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## **EAR:**

- 1. The physical and functional examination of the ear**
- 2. The functional and physical examination of the vestibular system.**
- 3. Tinnitus**
- 4. Affections of external ear**
- 5. Repair of deformities of the external ear.**
- 6. Congenital conditions of the middle ear cleft**
- 7. Traumatic conductive deafness**
- 8. Acute inflammation of the middle ear cleft**
- 9. Non-suppurative otitis media**
- 10. Chronic suppurative otitis media**
- 11. Management of chronic suppurative otitis media**
- 12. Complications of infections of middle ear.**
- 13. Tumors of the middle ear cleft and temporal bone**
- 14. Diseases of the otic capsule-otosclerosis**
- 15. Diseases of the otic capsule-other diseases**
- 16. The deaf child & management**
- 17. Acoustic neuroma**
- 18. Ototoxicity**
- 19. Presbycusis**
- 20. Diagnosis and management of sudden and fluctuant sensorineural hearing loss**
- 21. Meniere's disease**
- 22. Neurologic aspects of vertigo**
- 23. Facial paralysis**
- 24. Rehabilitation of adults with acquired Hearing Loss-Hearing aids**
- 25. The cochlear Implants**
- 26. Nystagmus**
- 27. Otoacoustic emissions**
- 28. Traumatic lesions of the inner ear**
- 29. Inflammatory lesions of the vestibular and auditory nerve**



### 30. Vascular lesions of the inner ear

NOSE:	
1.	Examination of the nose
2.	Conditions of the external nose
3.	Injuries of the facial skeleton
4.	Congenital diseases of the nose
5.	The nasal septum
6.	Foreign bodies in the nose, rhinolith
7.	Epistaxis
8.	Acute chronic inflammations of the nasal cavities
9.	Vasomotor rhinitis-allergic and non-allergic
10.	Nasal polyposis
11.	Abnormalities of smell
12.	Acute sinusitis
13.	Chronic sinusitis
14.	Nasal Allergy/Fungal allergic sinusitis
15.	Complications of acute and chronic sinusitis
16.	Tumors of nose and sinuses
17.	Facial pains
18.	Trans-ethmoidal hypophysectomy
19.	Functional endoscopic sinus surgery (FESS)
20.	Surgery of the pterygopalatine fossa
21.	CSF Rhinorrhoea
22.	Snoring and sleep apnoea
23.	Orbit in relation to ENT
24.	Skull Base Surgery

## 25. Aesthetic surgery of the nose

## THROAT:

1. Methods of examination of the mouth and pharynx
2. Diseases of the mouth
3. Diseases of the salivary glands
4. Pharyngeal lesions associated with general diseases
5. Diseases of the tonsils and adenoids (excluding neoplasms)
6. Tumors of the pharynx
7. Hypopharyngeal diverticulum (Pharyngeal Pouch)
8. Methods of examining and larynx and tracheobronchial tree
9. Congenital diseases of the larynx
10. Laryngeal disorders in singers and other voice users
11. Neurological affections of larynx and pharynx
12. Intubation of the larynx, laryngotomy and tracheostomy
13. Cervical node dissection
14. Skin grafts in Otolaryngology and reconstructive methods including regional and distant flaps for repair of defects after excision of tumors or trauma.
15. Micro laryngeal surgery/thyroplasty

<b>MISCELLANEOUS AND HEAD AND NECK:</b>
-----------------------------------------

- |                                                                                                                |
|----------------------------------------------------------------------------------------------------------------|
| 1. Cranial Nerves                                                                                              |
| 2. Raised intracranial tension-causes, diagnosis, management with particular reference to otitis hydrocephalus |
| 3. Head injuries and I.C. Hemorrhage                                                                           |
| 4. Pituitary gland, anatomy, physiology hypo - and hyper - pituitarism, new growths.                           |
| 5. Intracranial venous sinuses and their affections                                                            |
| 5. Osteology: skull, mandible cervical and thoracic vertebral sternum                                          |
| 6. Cervical fascia, facial spaces in neck, retro-pharyngeal and parapharyngeal Abscesses                       |
| 7. Anatomy and physiology of thyroid gland, goitre, diseases of the thyroid and carcinoma of thyroid.          |

<b>8.</b> Large blood vessels in neck, thoracic duct & development of major cervical and thoracic blood vessels.
<b>9.</b> Head and neck reconstructive surgery
<b>10.</b> Chemo / Radio/ Photodynamic therapy
<b>11.</b> Angiofibroma and nasopharyngeal lesions
<b>12.</b> Tumours of infra temporal fossa and parapharyngeal space. The cysts, granulomas and tumors of jaw, nose and sinuses.
<b>13.</b> The esophagus in otolaryngology, facial plastic surgery
<b>14.</b> Functional Anatomy of cerebellum and brainstem
<b>15.</b> Anatomy of mediastinum
<b>16.</b> Pleura, plural cavity, broncho-pulmonary segments and their clinical importance

#### DRUGS USED IN ENT:

1. Antibiotics Antihistaminic
2. Nasal vasoconstrictors
3. Local anaesthetics
4. Corticosteroids
5. Cyto-toxic agents
6. Antibiotics
7. Radioactive isotopes
8. Antifungal agents
9. Vasopressive and other agents used in shock like states.

#### ii) Clinical/ Practical

Mandatory: dissection of head & neck

10 temporal bone dissections which include:

1. Cortical mastoidectomy
2. Modified radical mastoidectomy & radical mastoidectomy
3. Facial nerve decompression

4. Posterior tympanotomy
5. Labyrinthectomy
6. Endolymphatic sac decompression
7. Translabyrinthine approach to internal auditory meatus

### iii) Essential list of surgical procedures

Following procedures are classified as:

- a) To be performed independently (PI)
- b) To assist a senior specialist/ consultant (PA)
- c) To observe the procedure(O)

### 1. Otology

- a) To be done independently (PI)Cortical mastoidectomy  
Modified radical mastoidectomy &radical mastoidectomyMyringoplasty  
Myringotomy and grommet insertion
- b) To assist/ observe a specialist/ consultant (PA)Ossiculoplasty  
Facial nerve decompression
- c) Stapedotomy (PA/O)

### 2) Rhinology

- a. To be done independently
  - i. Reduction of fracture nasal bones
  - ii. SMR
  - iii. Septoplasty
  - iv. Diagnostic nasal endoscopy
  - v. FESS
    - Uncinectomy
    - Polypectomy
    - Anterior ethmoidal cell clearance
    - Middle meatal antrostomy
  - vi. Caldwell Luc
  - vii. Intranasal antrostomy
- b. To assist or observe
  - i. FESS- Posteroethmoid/ sphenoid/frontal sinus surgery.
  - ii. Maxillofacial surgeries.
  - iii. External operations of frontoethmoid sinus.
  - iv. Maxillectomy
    - Total
    - Partial

### 3) Laryngology, Head and Neck

- a. To be done independently (PI)

- i. Tracheostomy
  - ii. Tonsillectomy
  - iii. Adenoidectomy
  - iv. Direct laryngoscopy
  - v. Oesophagoscopy/ foreign body removal from larynx, bronchus and esophagus
- b. To assist or observe
  - i. Bronchoscopy
  - ii. Total/ Partial Laryngectomy
  - iii. Block dissections of the neck
- c. To wash and observe a senior(O)
  - i. Thyroid surgery
  - ii. Salivary gland surgery
  - iii. Microlaryngeal surgery

#### **IV. TEACHING AND LEARNING ACTIVITIES:**

##### **A. Theoretical teaching:**

1. Lectures: Lectures are to be kept minimum. Certain selected topics can be taken as lectures. Lectures may be didactic or integrated.
2. Journal club: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in log book the relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable with names of the students and the moderator should be announced in advance.
3. Subject seminar: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in log book the relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable with names of the students and the moderator should be announced in advance.
4. Case discussion: Recommended to be held once a week. All the PG students are expected to attend and actively participate in discussion and enter in log book the relevant details. The presentations would be evaluated using check lists and would carry weightage for internal assessment. A timetable with names of the students and the moderator should be announced in advance.
5. Ward rounds: Ward rounds may be service or teaching rounds.
  - a. Service rounds: Postgraduate students should do service rounds every day for the care of the patients. Newly admitted patients should be worked up by the post graduate student and presented to faculty members the following day.

- b. Teaching rounds: Each unit should have 'grand rounds' for teaching purpose at the bedside. A diary should be maintained for day-to-day activities by the postgraduate students.

Entries of (a) and (b) should be made in the log book.

6. Inter departmental meetings: Strongly recommended with the related other specialty departments which are to be attended by post graduate students and relevant entries to be made in the log book. During these meetings with the concerned specialty inputs are taken and discussed elaborately especially during seminars and case presentations.
7. Teaching skills: Postgraduate students must teach under graduate students by taking demonstrations, bedside clinics, tutorials, lectures etc. Assessment is made using a checklist by faculty as well as by the students. Record of their participation is to be kept in log book. Training of postgraduate students in educational science and technology will be done.
8. Continuing medical Education Programmes (CME): Recommended that at least 2 state level CME programmes should be attended by each student during the course.
9. Conferences: Post-graduate student should present at least one research poster/paper in national or state level conference in the form of oral or poster presentation.
10. Research activities: post-graduate student should publish at least one research paper as first author in national journal during the course of their study (paper accepted for publication is also considered).  
Basic practices for postgraduates in the initial year- Good clinical practice- post graduates should develop good clinical practices which is essential for training for clinical research that involve human participants.
11. BLS/ACLS - post graduates should undergo BLS/ACLS course so they will be skillful to manage cases in emergencies.  
NPTEL- all post graduates should undergo the BCBR course and clear NPTEL exams in the initial year of their course.
12. Department should encourage e-learning activities.
13. During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in the medical colleges is mandatory.
14. Attendance 80% mandatory.

#### B. Clinical/ Practical Training:

1. Rotational posting in other Departments:
  - ✓ Neurosurgery                      4 weeks
  - ✓ Plastic surgery                      4 weeks
  - ✓ Head & Neck Oncology      4 weeks

- Complete course in ethics including good clinical practices.



## V. ASSESSMENT

### 1. Internal/ Formative assessment:

During the course of three years, the department will conduct three tests each at the end of every year. The first two tests include theory and practical examination (OSCE). The third test will be a preliminary examination which may be held three months before the final examination. The test will include the written papers, practicals/clinicals and viva-voce. During formative assessment the focus will be based on Journal based/recent advances learning, Patient based /Laboratory or Skill based learning, Self-directed learning and teaching, Departmental and interdepartmental learning activity, External and Outreach activities /CMEs. Records and marks obtained in such tests will be maintained by the head of the Department and will be sent to the University when called for.

Assessment will be entered in the PG student Appraisal form as shown in the following format:

SR NO	PARTICULARS	NOT SATISFACTORY			SATISFACTORY			MORE THAN SATISFACTORY			REMARKS
		1	2	3	4	5	6	7	8	9	
	Journal based / Recent advances learning										
	Patient based or Skill based learning										
	Teaching abilities										
	Departmental and Interdepartmental Learning activity										
	CMEs/ Workshop/ Symposium/ Conferences										
	Thesis / Research work										
	Logbook Maintenance										

Results of all evaluations should be entered into departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

It is needed for PG to clear internal assessment every year to get into the next level of internal assessment.

## 2. Logbook:

Every candidate shall maintain a logbook/work diary and record his/her participation in the training programmes conducted by the department such as journal, reviews, seminars etc. Special mention may be made of the presentations by the candidates as well as details of clinical or Laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the logbook. All the daily activities including the ward rounds and the routine procedures performed on day-to-day basis should be entered in the logbook and it should be verified and signed by the faculty member. The logbook shall be scrutinized and certified by the head of department and head of the Institution and presented during the University practical/clinical examination. The contents of the Logbook are as follows:

Postings
Research Projects
Check list for Synopsis Presentation
Check list for Dissertation Presentation
Continuous Evaluation of Dissertation Work
Journal Club Attended
Journal Club (Article) Presented
Check list for Journal Article Presentation
Subject Seminar/ Symposium Attended
Subject Seminar/ Symposium Presented
Check list for Seminar/ Symposium Presentation
Clinical Case Presentation
Evaluation form for Clinical Case Presentation
Undergraduate Teaching Lecture
Undergraduate Teaching Practicals/ Clinical Demo
Check list for Teaching Skill Practice
JNMC Scientific Society Clinical Meetings Attended
Mortality Meeting-Cases Presented
CME/Workshops/ Conference Attended
Scientific Papers/ Posters Presented in the

Conference
Check list for Evaluating Clinical works in Ward / OPD
Diagnostic & Operative, Practical Procedures Performed
Internal Evaluation Marks
Academic Performance of PG during the Course.
Record of Daily Diary

### 3. Dissertation/Thesis:

Every candidate pursuing MS degree course is required to carry out work on a selected research project under the guidance of a recognized post graduate teacher. The results of such a work shall be submitted in the form of a dissertation/ thesis with the following contents:

Introduction
Objectives
Review Of Literature
Materials And Methods
Results
Discussion
Conclusion
Summary
Bibliography
Annexures

Dissertation review meeting is conducted once a month to know the progress of the work and timeline of the research work is maintained

## VI. SUMMATIVE ASSESSMENT:

Criteria for appearing in the exam: Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and formative assessment are satisfactory and dissertation is accepted.

Criteria for passing exam: Minimum of 50% in theory, Practicals and viva voce.

### A) Theory: 400 Marks

The examinations shall be organised on the basis of 'Grading' or 'Marking system' to

evaluate and to certify candidate's level of knowledge, skill and competence at the end of the training. The examination for MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

There shall be four papers, each of three hours duration. Total marks of each paper will be 100. Question on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

Type of Questions	No of Questions	Marks for each question	Total Marks
Essay questions	10	10	100
Grand Total	4X 100		400

Theory shall consist of four papers of 3 hours each.

Theory written papers details will be:

PAPER I: Basic Sciences related Otolaryngology	100 Marks
PAPER II: Principles and Practices of Otolaryngology	100 Marks
PAPER III: Recent Advances in Otolaryngology and Head & Neck Surgery	100 Marks
PAPER IV: General Surgical Principles and Head & Neck Surgery	100 Marks

Note: The distribution of chapters / Topics shown against the papers are suggestive only and may overlap or change.

**B. Clinical /Practical Examination:****300 Marks**

To elicit competence in clinical skills and to discuss differential diagnostic / therapeutic aspects.

Clinical examination shall be conducted to test the knowledge, skills, attitude and competence of the post graduate students for undertaking independent work as a specialist/teacher. Following is the format for the same:

Type of cases	No of cases	Marks
Dissertation		20
Long case	01	100
Short case	02 (50 Marks each)	100
OSCE	5 stations X 5 marks	25
Operative Case Scenario Discussion*	01 (25 Marks each)	25
Emergency Case Scenario Discussion*	01(30 Marks)	30
TOTAL	10	300

\*Candidate is asked to pick up a chit from the lot and discuss regarding a. Operative Case Scenario and b. Emergency Case Scenario.

**C. Viva-Voce Examination:  
100 Marks**

To elicit candidate's knowledge and investigative/ therapeutic skills. The Oral examination shall be thorough and shall aim at assessing the post graduate student's knowledge and competence about the subject, investigative procedures, therapeutic technique and other aspects of the specialty, which form a part of the examination.

1. Viva - voce examination it comprises of:  
Marks

**80**

All examiners will conduct viva - voce conjointly on candidate's comprehension, analytical approach, expression and interpretation of data. It includes all components of course contents. In addition, candidates may be given case reports, spirometry, (Arterial Blood Gas) ABG, gross specimens, histopathology slides, X-ray, Ultrasound, CT scan images, PFT report, Ventilation - perfusion scan images etc., for interpretation and questions on these as well as use of instruments and operative procedures will be asked. Student's knowledge on use of instruments and drugs pertaining to the respiratory system will also be evaluated during viva-voce examination. It includes discussion on dissertation also.

2. Pedagogy Exercise + Log book  
Marks

20

- a. Candidate is asked to make a brief presentation on the dissertation topic  
10 Marks
- b. Review of the logbook  
10 Marks

Maximum Marks for Degree M.S. in Otorhinolaryngology and Head & Neck Surgery	Theory	Practical	Viva	Grand Total
	400	300	100	800

**D. Minimum Marks:**, minimum of 50% ( i.e., 400/800) is mandatory to declare passing. Theory 50% ( Minimum 40% in each Paper ) Practical 50% to be declared as pass.

**\*University shall conduct not more than two examination in a year, with an interval not less than 4 month and not more than 8 months between the examination**

**VI. RECOMMENDED BOOKS (Latest editions)**

SL. NO.	NAME OF THE TEXTBOOK	AUTHORS	PUBLISHER
1	SCOTT BROWN'S OTORHINOLARYNGOLOGY & HEAD AND NECK SURGERY (3vols) VIII edition	MICHAEL GLEESON & OTHERS	HODDER AMOLD
2	CUMMINGS OTOLARYNGOLOGY, HEAD AND NECK SURGERY 5 volumes	CHARLES W CUMMINGS, PAUL W F LINT, LEE A HARKER, BRUCE HAUGH LEY, MARK A RICHARDSON, K. THOMAS ROBBINS, DAVID E SCHULLER, J REGAN THOMAS	ELSEVIER, MOSBY
3	ROB AND SMITH OPERATIVE SURGERY EAR, NOSE AND THROAT, HEAD & NECK	HUGH, DAVID CARTER, RCG RASSEL	BUTTERWORTH'S
4	PAPERELLE OTOLARYNGOLOGY 4 VOL SET	PAPARELLA, SHUMRICK, ALLAN, MEYERHOFF	W.B. SAUNDERS

5	LOGAN TURNER'S DISEASES OF THE NOSE, THROAT AND EAR	A.G.D MARAN	BUTTERWORTH HEINEMANN Ltd.
6	AN ATLAS OF HEAD AND NECK SURGERY	LORE	W.B. SAUNDERS
7	GLASSCOCK- SHAMBAUGH SURGERY OF THE EAR	MICHAEL GLASSCOCK III, AINA JULIANNA GULYA	BC DEREK Inc. ELSEVIER
8	BALLENGER SNOW Jr. OTORHINOLARYNGO LOGY, HEAD AND NECK SURGERY	JOHN JACOB BALLENGER JAMES B SNOW	LIPPINCOTT WILLIAMS & WILKINS
9	HEAD AND NECK ONCOLOGY	JATIN P SHAH SNEHAL G PATIL	MOSBY
10	SURGERY OF THE CANCER OF THE LARYNX	CARL E SILVER	W.B SAUNDERS COMPANY
11	HEAD AND NECK SURGERY	JOHN C WATKINSON MARK NGAZE JANET A WILSON	BUTTERWORTH HEINEMANN
12	PHONOSURGERY	HARVEY M TUCKER	CHURCHILL LIVINGSTONE
13	PAEDIATRIC OTOLARYNGOLOGY	CHARLES F FERGUSON SYLVAN E STOOL CUNEY T M ALPER ELLIS M ARJMAND	ELSEVIER
14	PAEDIATRIC OTOLARYNGOLOGY	CHARLES F FERGUSON EDWIN L KENDIG	W B SAUNDERS
15	TEMPORAL BONE DISSECTION ANATOMY OF TEMPORAL BONE	BARRY J ANSON JAMES A DONALDSON	W B SAUNDERS
16	LEARNING EAR BY TEMPORAL BONE DISSECTION	DR.K.K. RAMALINGAM DR. SREERAMMURTHY B	CHINNAMAL ENT MEDICAL EDUCATION AND RESEARCH FOUNDATION

17	CLINICAL AUDIO/VESTIBULOME TRY	ANIRBAN BISWAS	BHALANI PUBLICATION HOUSE MUMBAI
18	HANDBOOK OF CLINICALAUDIOLOGY	JACK KATZ	WOLTERS K
19	SURGICAL TECHNIQUE OF THE TEMPORAL BONE ANDSKULL BASE	SILVERSTAIN H ROSENBER	LEA FEBIGER
20	MICROSURGERY OF THESKULL BASE	U. FISCH MATTOX D	GEORGE THIEMEVERLAG
21	FUNCTIONAL ENDOSCOPY SINUS SURGERY	STAMMBERGER H	B.C. DECKER INC PUBLISHER
22	CONTROVERSIES OF ENT/OTOLARYNGOL OGY	MYLES L PENSAK	THIEME
23	RECENT ADVANCES IN OTOLARYNGOLOGY	LALWANI & PFISTER	JAYPEE BROTHERS-2012
24	OPERATIVE OTOLARYNGOLOGY HEAD AND NECK SURGERY	EUGENE MYERS CARL SNYDERMAN	ELSEVIER
25	STELL AND MARAN'S TEXTBOOK OF HEAD AND NECK SURGERY AND ONCOLOGY FIFTH EDITION	JOHN C WATKINSONRALPH W GILBERT	HODDERARNOLD
26	ANATOMICAL PRINCIPLES OF ENDOSCOPIC SINUSSURGERY	RENUKA BRADOO	TAYLOR & FRANCIS
27	ATLAS OF MICROSURGERYOF THE LATERAL SKULL BASE	MARIO SANNA	THIEME



28	ATLAS OF SURGERY OF THE FACIAL NERVE	D S GREWAL	JAYPEE
29	DISEASE OF THE EAR	HAROLD LUDMANTONY WRIGHT	ARNOLD

**VI. RECOMMENDED JOURNALS:**

SL NO.	NAME OF THE JOURNAL
1	THE LARYNGOSCOPE- LIPPINCOTT WILLIAMS & WILKINS
2	INDIAN JOURNAL OF OTOLARYNGOLOGY AND HEAD & NECK SURGERY - SPRINGER
3	ANNALS OF OTOLOGY, RHINOLOGY & LARYNGOLOGY - ANNALSPUBLISHING CO.
4	THE OTOLARYNGOLOGY CLINICS OF NORTH AMERICA - WB SAUNDERS COMPANY
5	JOURNAL OF LARYNGOLOGY & OTOLOGY-UK CAMBRIDGE UNIVERISTY PRESS
6	INDIAN JOURNAL OF OTOLOGY DR.M. KTANEJA, MUJAFARNAGAR
	RECENT ADVANCES IN OTORHINOLARYNGOLOGY-MOSBY
8	ARCHIVES OF OTORHINOLARYNGOLOGY - AMERICAN MEDICALASSOCIATION

# **CURRICULUM FOR COMPETENCY BASED POSTGRADUATE TRAINING PROGRAMME FOR MS IN OPHTHALMOLOGY**

## **PREAMBLE:**

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training. The purpose of this programme is to standardize Ophthalmology teaching at post graduate level throughout the country so that it will benefit in achieving uniformity in post graduate and undergraduate teaching as well as result in creating competent ophthalmic surgeons with appropriate expertise. The purpose of this document is to provide teachers and learners illustrative guidelines to achieve defined outcomes through learning and assessment. This document was prepared by various subject-content specialists. The Reconciliation Board of the Academic Committee has attempted to render uniformity without compromise to purpose and content of the document. Compromise in purity of syntax has been made in order to preserve the purpose and content. This has necessitated retention of “domains of learning” under the heading “competencies”.

## **GOALS:**

The goals of postgraduate training course would be to train a MBBS doctor who will

- Practice efficiently and effectively, backed by scientific knowledge and skill base with sufficient understanding of basic sciences, recent advances and clinical applications related to the specialty to be able to integrate this knowledge into clinical practice.
- Practice Evidence Based Medicine (EBM) in the field of Ophthalmology.
- Exercise empathy and caring attitude and maintain high ethical standards.

- Practice his specialty ethically, keeping in mind the requirement of the patient, community and people at large.
- Plan and advice measures for the promotive, preventive, curative and rehabilitative aspects of health and diseases in the specialty of Ophthalmology.
- Should be able to demonstrate his cognitive skills in the field of Ophthalmology and its ancillary branches during the formative and summative evaluation process.
- Play the assigned role in implementation of National Programs for Control of Blindness.
- Continue to evince keen interest in continuing education in the specialty irrespective of whether he / she is in a teaching institution or is a practicing surgeon.
- Demonstrate competence in basic concepts of research methodology and writing thesis and research papers.
- Be a motivated 'teacher' – defined as a specialist keen to share his/her knowledge and skills with colleague or a junior or any learner.

## **OBJECTIVES**

The clinical Post graduate training programmes are intended at developing in a student a blend of qualities that of a clinical specialist, a teacher and a researcher. The following objectives are laid out to achieve the goals of the course. These

objectives are to be achieved by the time the candidate completes the course.

These programmes are organized such that a post graduate student should possess the following qualities, knowledge and skills:

1. Knowledge
2. Skills

### 3. Human values, ethical practice and communication abilities.

#### **1. Knowledge:**

- a. At the completion of the course, candidate should demonstrate sound knowledge of clinical manifestations of common ophthalmic diseases, including emergency situations and investigative procedures to confirm the diagnosis.
- b. Demonstrate comprehensive knowledge of various modes of treatment, both medical and surgical.
- c. Be aware of his or her own limitations to the application of the specialty in situations which warrant referral to more qualified centers or individuals.
- d. Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his /her practice.

#### **2. Skills:**

- a) On the completion of the course, the candidate shall be able to offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, in most of the common and easily managed situations at the District or Secondary level of health service.
- b) He should be able to plan the educational programmes for health professionals and be familiar with modern methods of teaching and evaluation.
- c) Apply research and epidemiological methods during his / her practice. The candidate shall be able to present or publish work done by him/her.

#### **3. Human values, Ethical practice and Communication abilities:**

- Adopt ethical principles in all aspects of his/her practice; professional honesty and integrity are to be fostered. Care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Develop communication skills, in particular the skill to explain various options

available in management and to obtain a true informed consent from the patient.

- Provide leadership and get the best out of his team in a congenial working atmosphere.
- Apply high moral and ethical standard while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed,
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

#### **Basic practices for post graduates before initiations of course**

- D. Good clinical practice-** post graduates should develop good clinical practices which is essential for training for clinical research that involve human participants.
- E. BLS/ACLS –** post graduates should undergo BLS/ACLS course so they will be skillful to manage cases in emergencies.
- F. NPTEL-** all post graduates should undergo the BCBR course and clear NPTEL exams.

### **PROGRAMME OBJECTIVES**

The student should possess basic knowledge of the structure, function and development of the human body as related to ophthalmology, of the factors which may disturb these mechanisms and the disorders of structure and function which may result thereafter.

- a. The student should be able to practice and handle most day-to-day problems independently in ophthalmology. The student should recognize

the limitations of his/her own clinical knowledge and know when to seek further help.

- b. The student should understand the effects of environment on health and be familiar with the epidemiology of at least the more common diseases in the field of ophthalmology.
- c. The student should be able to integrate the preventive methods with the curative and rehabilitative measures in the comprehensive management of the disease.
- d. The student should be familiar with common eye problems occurring in rural areas and be able to deal with them effectively.
- e. The student should also be made aware of Mobile Ophthalmic Unit and its working and components.
- f. The student should be familiar with the current developments in Ophthalmic Sciences.
- g. The student should be able to plan educational programmes in Ophthalmology in association with senior colleagues and be familiar with the modern methods of teaching and evaluation.
- h. The student should be able to identify a problem for research, plan a rational approach to its solution, execute it and critically evaluate his/her data in the light of existing knowledge.

- i. The student should reach the conclusions by logical deduction and should be able to assess evidence both as to its reliability and its relevance.
- j. The student should have basic knowledge of medico-legal aspects of medicine. 1. The student should be familiar with patient counseling and proper consent taking.

### **SUBJECT SPECIFIC COMPETENCIES**

A post graduate student upon successfully qualifying in the M.S. (Ophthalmology) examination should be able to:

- a) Offer to the community, the current quality of 'standard of care' in ophthalmic diagnosis as well as therapeutics, medical or surgical, in most of the common situations encountered at the level of health services.
- b) Periodically self assess his or her performance and keep abreast with ongoing advances in the field and apply the same in his/her practice.
- c) Be aware of her/his own limitations to the application of the specialty I situations, which warrant referral to more qualified centers or individuals.
- d) Apply research and epidemiological methods during his/her practice. The post graduate student should be able to present or publish work done by him/her.
- e) Contribute as an individual/group towards the fulfillment of national objectives with regard to prevention of blindness.



- f) Effectively communicate with patients or relatives so as to educate them sufficiently and give them the full benefit of informed consent to treatment and ensure compliance.

**At the end of the course, the student should have acquired knowledge in the following:**

**A. Cognitive domain**

**Basic Medical Sciences:**

- Attain understanding of the structure and function of the eye and its parts in health and disease.
- Attain understanding and application of knowledge of the structure and function of the parts of Central Nervous System and other parts of the body with influence or control on the structure and function of the eye.
- Attain understanding of and develop competence in executing common general laboratory procedures employed in diagnosis and research in Ophthalmology.

**1. Clinical Ophthalmology:**

Given adequate opportunity to work on the basis of graded responsibilities in outpatients, inpatient and operation theatres on a rational basis in the clinical sections from the day of entry to the completion of the training programme, the students should be able to:

- Acquire scientific and rational approach to the diagnosis of ophthalmic cases presented.

- Acquire understanding of and develop inquisitiveness to investigate to establish cause and effect of the disease.
- To manage and treat all types of ophthalmic cases.
- To competently handle and execute safely all routine surgical procedures on lens, glaucoma, lid, sac, adnexa, retina and muscle anomalies.
- To competently handle all ophthalmic medical and surgical emergencies.
- To be familiar with micro-surgery and special surgical techniques.
- To demonstrate the knowledge of the pharmacological (including toxic) aspects of drugs used in ophthalmic practice and drugs commonly used in general diseases affecting the eyes.

## **2. Refraction:**

- Acquire competence in assessment of refractive errors and prescription of glasses for all types of refraction problems.
- Acquire basic knowledge of manufacture and fitting of glasses and competence of judging the accuracy and defects of the dispensed glasses.

## **3. Ophthalmic super-specialties:**

Given an opportunity to work on a rotational basis in various special clinics of sub-specialties of ophthalmology, if possible, the student should be able to:

- Examine, diagnose and demonstrate understanding of management of the problems of neuro-ophthalmology and refer appropriate cases to neurology and neuro-surgery.
- Examine, diagnose and demonstrate understanding of management of (medical and surgical) complicated problems in the field of (a) lens, (b) glaucoma, c) cornea, (d) retina, (e) pediatric ophthalmology, (f) Oculoplasty, (g) uvea, and (I) genetic problems in ophthalmology.
- To demonstrate understanding of the manufacture, and competence in prescription and dispensing of contact lenses and ocular prosthesis.

#### **4. Ophthalmic pathological/microbiological/biochemical sciences**

- Be able to interpret the diagnosis in correlation with the clinical data and routine materials received in such cases.

#### **5. Community Ophthalmology**

Eye camps may be conducted where the PG students are posted for imparting training to according to a set methodology. The community and school surveys may also be conducted by the post graduate students.

The post graduate students are given an opportunity to participate in surveys, eye camps. They should be able to guide rehabilitation workers in the organization and training of the blinds in art of daily living and in the vocational training of the blind leading to gainful employment.

#### **6. Research :**

- Recognise a research problem.
- State the objectives in terms of what is expected to be achieved in the end.
- Plan a rational approach with appropriate controls with full awareness of statistical validity of the size of the material.
- Spell out the methodology and carry out most of the technical procedures required for the study.
- Accurately and objectively record on systematic lines results and observation made.
- Analyze the data with the aid of an appropriate statistical analysis.
- Interpret the observations in the light of existing knowledge and highlight in what ways the study has advanced existing knowledge on the subject and what further remains to be done.
- Write a thesis in accordance with the prescribed instructions.
- Write at least one scientific paper as expected of International Standards from the material of this thesis.

## **B. Affective Domain:**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.
3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.

## **C. Psychomotor domain**

**At the end of the course, the student should acquire following clinical skills:**

### **Essential diagnostic skills:**

#### **I. Examination techniques along with interpretation**

##### **1. Slit lamp Examination**

- i. Diffuse examination
- ii. Focal examination
- iii. Retroillumination – direct and indirect
- iv. Sclerotic scatter
- v. Specular reflection
- vi. Staining modalities and interpretation

##### **2. Fundus evaluation**

- Direct/Indirect ophthalmoscopy
- Fundus drawing
- 3-mirror examination of the fundus
- 78-D/90-D/60-D examination

- Amsler's charting

## **II. Basic investigations along with their interpretation**

### **1. Tonometry**

Tonometry - Applanation/Indentation/Non-contact

### **2. Gonioscopy**

Gonioscopy grading of the anterior chamber angle

### **3. Tear/ Lacrimal function tests**

- i. Staining- fluorescein and Rose Bengal
- ii. Schirmer test/tear film break up time
- iii. Syringing
- iv. Dacrocystography

### **4. Corneal**

- Corneal scraping and cauterization
- Smear preparation and interpretation (Gram's stain /KOH )
- Media inoculation
- Keratometry - performance and interpretation
- Pachymetry
- Corneal topography - if available

### **5. Colour Vision evaluation**

- Ishihara pseudoisochromatic plates
- Farnsworth Munsell, if available

### **6. Refraction**

- i. Retinoscopy- Streak/ Priestley Smith
- ii. Use of Jackson's cross-cylinder
- iii. Subjective and objective refraction
- iv. Prescription of glasses

### **7. Diagnosis and assessment of Squint**

- i. Ocular position and motility examination
- ii. Synoptophore usage
- iii. Lees screen usage
- iv. Diplopia charting
- v. Assessment of strabismus - cover tests/prisms bars
- vi. Amblyopia diagnosis and treatment
- vii. Assessment of convergence, accommodation, stereopsis, suppression

## **8. Exophthalmometry**

Usage of Hertel's exophthalmometer - proptosis measurement

## **9. Contact lenses**

- Fitting and assessment of RGP and soft lenses
- Subjective verification of over refraction
- Complications arising of contact lens use
- Educating the patient regarding CL usage and imparting relevant
- knowledge of the complications arising thereon

## **10. Low Vision Aids**

- Knowledge of basic optical devices available and relative advantages and disadvantages of each.
- The basics of fitting with knowledge of availability & cost

**III. The post graduate must be well versed with the following investigative modalities although the student may or may not perform it individually.**

**But, she/he should be able to interpret results of the following tests:**

1. Fundus photography
2. Fluorescein angiography
3. Ophthalmic ultrasound A-scan/B scan
4. Automated perimetry for glaucoma and neurological lesions
5. Radiological tests - X rays - Antero posterior/ Lateral view

PNS (Water's view) / Optic canal views

Localisation of intra-ocular and intra-orbital FBs

Interpretations of -USG/ CT/ MRI Scans

6. OCT and UBM

7. ERG, EOG, and VEP

#### **IV. Minor surgical procedures – Must know and perform independently**

- Conjunctival and corneal foreign body removal on the slit lamp
- Chalazion incision and curettage
- Pterygium excision
- Biopsy of small lid tumours
- Suture removal- skin/conjunctival/corneal/ corneoscleral
- Tarsorrhaphy
- Subconjunctival injection
- Retrobulbar, parabolbar anaesthesia
- Posterior Sub-Tenon's injections
- Artificial eye fitting

#### **V. Surgical procedures**

1. Must know and can perform independently

a. Ocular anaesthesia:

- Retrobulbar anaesthesia
- Peribulbar anaesthesia
- Facial blocks- O'Brein / Atkinson/Van lint and modifications
- Frontal blocks
- Infra orbital blocks
- Blocks for sac surgery

2. Must be able to independently perform and deal with complications arising

from the following surgeries :

- Lid Surgery - Tarsorrhaphy
  - Ectropion and entropion
  - Lid repair following trauma
  - Epilation
- Destructive procedures
  - Evisceration with or without implant
  - Enucleation with or without implant
- Sac surgery
  - i. Dacryocystectomy
  - ii. Dacryocystorhinostomy
  - iii. Probing for congenital obstruction of nasolacrimal duct
- Strabismus surgery
  - Recession and resection procedures on the horizontal recti.
- Orbit surgery
  - Incision and drainage via anterior orbitotomy for abscess
- Cyclocryotherapy/Cyclophotocoagulation

3. PG Students should be well conversant with use of operating microscope and must be able to perform the surgeries listed below competently under the same:

- Cataract surgery
  - i. Standard ECCE (extracapsular cataract extraction; first year) with or without IOL implantation
  - ii. Small incision ECCE with or without IOL implantation and/or Phacoemulsification with PC IOL implantation
  - iii. Intracapsular cataract extraction (second year)
  - iv. Cataract with Phacoemulsification (third year)
  - v. Secondary AC or PC IOL implantation



- Vitrectomy/Scleral buckling
- Intra-vitreous and intra-cameral (anterior chamber) injection techniques and doses of drugs for the same
- Needs to know the basis of open sky vitrectomy (anterior segment) as well as management of cataract surgery complications.
- Assisting vitrectomy and scleral buckling procedures
- Ocular surface procedures
- Pterygium excision with modifications
- Conjunctival cyst excision/foreign body removal
- Corneal foreign body removal
- Conjunctival flap/ peritomy
- Glaucoma
  - Trabeculectomy
- Corneal
  - Repair of corneo - scleral perforations
  - Corneal suture removal
  - Application of glue and bandage contact lens

4. Should have performed/assisted the following microscopic surgeries

- i. Keratoplasty
  - Therapeutic and optical
- ii Glaucoma surgery
  - Pharmacological modulation of trabeculectomy
  - Trabeculotomy
  - Goniotomy
  - Glaucoma valve implant surgery

5. Desirable to be able to perform following laser procedures

- Yag Capsulotomy
- Laser iridotomy
- Focal and panretinal photocoagulation

6. Should have assisted/knowledge of Keratorefractive procedures

### **Operations:**

The PG is provided with an opportunity to perform operations both extra-ocular and intra-ocular with the assistance of the senior post graduate students and/or under the direct supervision of a faculty member. The student is provided with an opportunity to learn special and complex operations by assisting the senior post graduate student or the faculty in operations of cases of the specialty and be responsible for the postoperative care of these cases.

In **first phase**, the post graduate student is given training in preparations of cases for operation, pre-medication and regional anaesthetic blocks.

In the **next phase**, the postgraduate student assists the operating surgeon during the operations.

In the **third phase**, the post graduate student operates independently assisted by senior postgraduate student or a faculty member. She/he is required to be proficient in some operations and show familiarity with others.

## **Syllabus**

## **Course contents:**

These are only broad guidelines and are illustrative, there may be overlap between sections.

## **THEORY**

### ***I. Basic Sciences:***

#### 1. Orbital and ocular anatomy

##### i. Gross anatomy

##### ii. Histology

##### iii. Embryology

#### 2. Ocular Physiology

#### 3. Ocular Pathology

#### 4. Ocular Biochemistry

General biochemistry, biochemistry applicable to ocular function

#### 5. Ocular Microbiology

General Microbiology, specific microbiology applicable to the eye

#### 6. Immunology with particular reference to ocular immunology

#### 7. Genetics in ophthalmology

#### 8. Community Eye Health

### ***II. Optics***

#### a. Basic physics of optics

#### b. Applied ophthalmic optics

#### c. Applied optics including optical devices

#### d. Disorders of Refraction

### ***III. Clinical Ophthalmology***

#### i. Disorders of the lids

#### ii. Disorders of the lacrimal system

#### iii. Disorders of the Conjunctiva

#### iv. Disorders of the Sclera

- v. Disorders of the Cornea
- vi. Disorders of the Uveal Tract
- vii. Disorders of the Lens
- viii. Disorders of the Retina and vitreous
- ix. Disorders of the Optic Nerve and Visual Pathway
- x. Disorders of the Orbit
- xi. Glaucoma
- xii. Neuro-ophthalmology
- xiii. Paediatric ophthalmology
- xiv. Ocular involvement in systemic disease
- xv. Immune ocular disorders
- xvi. Strabismus and Amblyopia
- xvii. Ocular oncology
- xviii. Ocular trauma
- xix. Community ophthalmology
- xx. Visual rehabilitation
- xxi. Lasers in ophthalmology
- xxii. Ocular therapeutics

#### **DRUGS USED IN OPHTHALMOLOGY:**

1. **Antibiotics**
2. **Antihistaminic**
3. **Local anaesthetics**
4. **Corticosteroids**
5. **Cycloplegics and mydriatics**
6. **Antiviral agents**
7. **Antifungal agents**

8. Tear substitutes
9. Anti VEGF agents
10. Antiglaucoma agents

## **CLINICAL**

### **Essential Clinical skills – instrumentation:**

#### **Refraction:**

- a. Retinoscopy
- b. Subjective and objective refraction
- c. Use of Jackson's cross-cylinder
- d. Auto refractometer

#### **Slit Lamp Examination:**

- a. Diffuse examination
- b. Focal examination
- c. Retroillumination - direct & indirect
- d. Sclerotic scatter
- e. Specular reflection
- f. Staining modalities and interpretation

#### **Slit Lamp Accessories:**

Applanation Tonometry

Goldman's applanation tonometer

Gonioscopy

- Single mirror / 3 - mirror gonioscope
- Grading of the angle
- Testing for occludability
- Indentation gonioscopy
- Four Mirror Gonioscope

#### **Direct Ophthalmoscopy**

- Distant direct Ophthalmoscopy
- Detailed fundus examination
- Use of filters and graticule

#### **Indirect Ophthalmoscopy**

- Fundus evaluation including scleral depression

- Fundus drawing capability
- Use of filters provided

### **Optical Coherence Tomography**

- Principle
- Uses
- Interpretation

### **Slit Lamp Fundus Examination**

- 3-mirror examination of the fundus
- 78-D/90-D/60-D examination

### **Tonometry**

- Applanation tonometer
- Indentation (commonly Schiotz)

### **Keratometry**

- Performance & interpretation of keratometry
- Diagnosis of situations such as keratoconus
- Keratoscopy

### **Assessment of epiphora**

- Jone's dye test
- Syringing - performance & interpretation

### **Dry eye evaluation**

- Schirmer test
- Rose Bengal staining
- Tear film breakup time
- Tear meniscus evaluation

### **Corneal ulceration**

- Taking a corneal scraping
- Inoculation into media
- Evaluation of Gram's stain
- Evaluation of KOH preparation

### **Colour vision evaluation**

- Ishihara pseudoisochromatic plates

### **Use of Amsler's Grid**

- Instructing in the use of and interpretation of the chart.

### **Fundus photography & fundus fluorescein angiography (FFA, FAG)**

- Performance and interpretation of FFA
- Performance of indirect fluorescein angiography

## **Diagnosis & assessment of Squint**

- Ocular position and motility examination
- Versions, ductions and vergences
- Convergence facility estimation
- Cover / Uncover / Alternate cover test
- Use of prism bars or free prisms in assessment of squint
- Use of Bagolini's striated glasses / red filters / Maddox rod
- Use of Worth's four dot test
- Use of major amblyoscope
- Use & interpretation of the Hess chart / Lees' screen
- Use of synoptophore

## **Exophthalmometry**

- Measurement of proptosis or exophthalmos

## **Use and evaluation of ophthalmic ultrasound**

- A- Scan ultrasound with biometry
- B- Scan ultrasound examination

## **Perimetry**

- Kinetic Goldmann Perimetry
- Static computerized perimetry
- Interpretation of common field defects

## **Radiology**

Interpretation of plain skull films:

- PA-20 (Caldwell's view)
- PNS (Water's view)
- Lateral
- Submentovertical
- Optic canal views

Localisation of intra ocular and intra orbital foreign bodies

Interpretation of CT – Scans of Orbit and Eye

## **Contact Lenses**

- a. Assessment
- b. RGP fitting
- c. Soft lens fitting
- d. Troubleshooting

## **Low Vision aids**

- a. The basics of fitting with knowledge of availability & cost.

## **RESEARCH**

## **Essential Research Skills**

1. Record keeping
  - a. The ability to maintain records as scientifically as possible
  - b. Knowledge of computer software is helpful
2. Basic statistical knowledge
  - a. Ability to undertake clinical & basic research
  - b. Descriptive and Inferential statistics
  - c. Ability to publish results of one's work
3. Ability to constructively criticize publications in the field.
4. Presentation: Ability to present one's work effectively at various scientific conferences.

## **MISCELLANEOUS**

### **A. Community Ophthalmology**

- a. Ability to organize institutional screening
- b. Ability to organize peripheral eye screening camps
- c. Knowledge and ability to execute guidelines of (NCPB)  
National  
Program for Control of Blindness Prevention of Blindness.

### **B. Organisational capabilities**

- a. Ability to organize meetings, seminars and symposia
- b. Ability to get along with colleagues and work as a team with the other members of the department.
- c. Ability to interact with and work as team with other disciplines that may exist in the same hospital.

### **C. Teaching**

- a. The ability to pass on skills acquired to one's juniors, theoretical, procedural and surgical



## **TEACHING AND LEARNING METHODS**

### **Teaching Methodology:**

The theoretical knowledge is imparted to the post graduate student through distinct courses of lecture demonstrations, seminars, symposia and inter- and intradepartmental meetings. The students are exposed to recent advances through discussions in journal clubs and participation in CMEs, and symposia.

### **The post graduate students are imparted clinical training in several ways:**

#### **1. Group Discussion**

The junior post graduate students may present the symposium to their senior postgraduates where it is fully discussed before finally being discussed in front of the faculty or senior eye specialists. A free and fair discussion is encouraged. These discussions enable the post graduate students to prepare for a general discussion in the class.

#### **2. Clinical Case discussion**

- a. Bedside discussion on the rounds and outpatient teaching take their toll with patient management. Therefore in addition to these, clinical case discussions should form part of a department's schedule at a fixed time every week. This could range from 1-2 hours and could be held at least once a week. The choice and manner of presentation and discussion varies widely and is left to the discretion of the department. Every effort should be made to include as wide a variety of cases as possible over three years with multiple repetitions. Problem oriented approach is better as it aids in decision making skills.
- b. In addition to bedside teaching rounds, at least 5-hr of formal teaching per week are necessary.
- c. Consultant case presentation is another approach which should be encouraged as it aids in solving complex problems and also is forum for discussion of interesting cases.
- d. Case discussions on the patient's records written by the student is to be encouraged as it helps exercise the student's diagnostic and decision making skills. It also helps the consultant in critical evaluation of the student's progress academically.
- e. Case presentation at other in-hospital multidisciplinary forums.

- f. The postgraduate students shall be required to participate in the teaching and training programme of undergraduate students and interns.
- g. Department should encourage e-learning activities, Clinico-Pathological Conferences and Inter Departmental Meetings (with Neuro-Medicine, Dermatology and Paediatrics departments once in a month.)

### **3. Seminars**

Seminars should be conducted at least once weekly. The duration should be at least one hour. The topics selected should be repeated once in 3 years so as to cover as wide a range of topics as possible. Seminars could be individual presentations or a continuum (large topic) with many post graduate students participating.

### **4. Journal clubs**

Journals are reviewed in particular covering all articles in that subject over a 6 months period and are discussed by the post graduate student under the following headings.

#### **1) Aim**

#### **2) Methods**

#### **3) Observations**

#### **4) Discussions and**

#### **5) Conclusions**

The post graduate student to whom the journal is allotted presents the journal summaries to the senior postgraduates. They are expected to show their understanding of the aspects covered in the article and clarify any of the points raised in the article, offer criticisms and evaluate the article in the light of known literature.

**5.** A postgraduate student of a postgraduate degree course in broad specialities/super specialities would be required to present one poster presentation, to read one paper at a national/state conference and to present one research paper which should be published/accepted for publication/sent for publication during the period of his postgraduate studies so as to make him eligible to appear at the postgraduate degree examination.

**6. Out-Patients:** For the first six months of the training programme, post

graduate

students may be attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. During this period the post graduate student may also be oriented to the common ophthalmic problems.

After 6 months, the clinical post graduate student may work independently, where he receives new and old cases including refractions and prescribes for them. The post graduate students are attached to a senior post graduate student and faculty member whom they can consult in case of difficulty.

**7. Wards:** Each post graduate student may be allotted beds in the in-patient section depending upon the total bed capacity and the number of the post graduates. The whole concept is to provide the post graduate student increasing opportunity to work with increasing responsibility according to seniority. A detailed history and case record is to be maintained by the post graduate student.

**Relevance of beds and admissions in Ophthalmology has really gone down at present, as most of the surgical and special investigative procedures are being performed on out-patient basis. Most of the teaching has to be imparted in out-patients department and special Clinics.**

#### **8. Rotations: Specialty clinics**

The student may rotate in the following subspecialty clinics:

- Anterior segment and cataract
- Glaucoma
- Oculoplastics
- Paediatric ophthalmology and strabismus
- Retina and Uvea
- Cornea, Contact lens and low vision
- Neuroophthalmology
- Refractive Clinic

**9. District Residency Programme:** All post-graduate students pursuing M.D./M.S. in broad specialties in all medical colleges/institutions under the purview of the National Medical Commission shall undergo a compulsory residential rotation of three months in District Hospitals/ District Health System as a part of the course curriculum. Such rotation shall take place in the 3<sup>rd</sup> or 4<sup>th</sup> or 5<sup>th</sup> semester of the

postgraduate programme. In the case of those students who have taken admission after completion of the Diploma in the relevant Speciality, the District Residency Programme shall take place in the third semester only. Similarly, the post-graduate diploma students shall undergo the District Residency Programme in the third semester. This rotation shall be termed as 'District Residency Programme' (DRP) and the post-graduate medical student undergoing training shall be termed as a 'District Resident'.

#### **10. Practicals in Ocular Histopathology**

The post graduate students may be provided with fully stained slides of the ocular tissues along with relevant clinical data and discuss the diagnosis and differential diagnosis on the basis of the information provided

#### **11. Attend accredited scientific meetings (CME, Symposia, and Conferences).**

**12. Additional lecture sessions** on basic sciences, biostatistics, research methodology, teaching methodology, hospital waste management, health economics, medical ethics and legal issues related to ophthalmology practice are suggested.

**13. Additional e-learning sessions** – contact lens fitting and refractive surgeries

**14. Additional simulation-based learning** – laser capsulotomy and pan retinal photocoagulation

**15. Maintenance of log book:** Log books shall be checked and assessed periodically  
by the faculty members imparting the training.

**During the training programme, patient safety is of paramount importance; therefore, skills are to be learnt initially on the models, later to be performed under supervision followed by performing independently; for this purpose, provision of surgical skills laboratories in medical colleges is mandatory.**

#### **EDUCATIONAL STRATEGIES:**

Patient based learning - PBL  
Laboratory based learning - LBL  
Self-directed learning – SDL  
Group Discussion – GD  
DOAP session - Demonstration- Observation - Assistance - Performance

## **Cognitive Domain:**

### **Basic Medical Sciences:**

1. Clinical Ophthalmology - GD and Patient based learning
2. Refraction – Lecture and GD and PBL
3. Ophthalmic sub-specialties: PBL
4. Ophthalmic pathological/microbiological/biochemical sciences – Lecture, Laboratory based learning
5. Community Ophthalmology- outreach activities
6. Research – SDL

## **Psychomotor Domain : PBL**

### **I. Examination techniques along with interpretation**

1. Slit lamp Examination
2. Fundus evaluation

### **II. Basic investigations along with their interpretation:**

1. Tonometry
2. Gonioscopy
3. Tear/ Lacrimal function tests
4. Corneal
5. Colour Vision evaluation
6. Refraction
7. Diagnosis and assessment of Squint
8. Exophthalmometry
9. Contact lenses
10. Low Vision Aids

**III. Investigative modalities - may or may not perform it individually:  
should be able to interpret results :DOAP SESSION:**

1. Fundus photography
2. Fluorescein angiography
3. Ophthalmic ultrasound A-scan/B scan
4. Automated perimetry for glaucoma and neurological lesions
5. Radiological tests - X rays - Antero posterior/ Lateral view PNS (Water's view) / Optic canal views  
Localisation of intra-ocular and intra-orbital FBs Interpretations of -USG/ CT/ MRI Scans
6. OCT and UBM
7. ERG, EOG, and VEP

#### **IV. Minor Surgical Procedures – Must know and perform independently - PBL**

- Conjunctival and Corneal foreign body removal on the slit lamp
- Chalazion incision and curettage
- Pterygium excision
- Biopsy of small lid tumours
- Suture removal- skin/conjunctival/corneal/ corneoscleral
- Tarsorrhaphy
- Subconjunctival injection
- Retrobulbar, parabulbar anaesthesia
- Posterior Sub-Tenon's injection
- Artificial eye fitting

#### **V. SURGICAL PROCEDURES – GD, PBL**

##### **AFFECTIVE OBJECTIVES**

1. Should be able to function as a part of a team, develop an attitude of cooperation with colleagues, and interact with the patient and the clinician or other colleagues to provide the best possible diagnosis or opinion.
2. Always adopt ethical principles and maintain proper etiquette in dealings with patients, relatives and other health personnel and to respect the rights of the patient including the right to information and second opinion.

3. Develop communication skills to word reports and professional opinion as well as to interact with patients, relatives, peers and paramedical staff, and for effective teaching.
4. Participate in charity work through screening and operating eye camps.
- 5. Role models – eye donation, glaucoma awareness.**

#### **Skill or competency objectives – simulation**

1. Orbit dissection
2. Suturing techniques
3. Fundoscopy
4. Cataract surgery simulation
5. Laser capsulotomy and PRP simulation

### **IMPLEMENTATION – PLANNING**

#### **IN FIRST PHASE,**

**OT:** The Post graduate student is given training in preparations of cases for operation, pre-medication and regional anaesthetic blocks.

**In OPD,** Post graduate students may be attached to a faculty member to be able to pick up methods of history taking and ocular examination in ophthalmic practice. During this period the Post graduate student may also be oriented to the common ophthalmic problems.

#### **IN SECOND PHASE**

**OT :** In the second phase, the postgraduate student assists the operating surgeon during the operations.

**OPD :** The clinical post graduate student may work independently, where he receives new and old cases including refractions and prescribes for them. The post graduate students are attached to a senior post graduate student and faculty member whom they can consult in case of difficulty.

#### **IN THIRD PHASE**

**OT:** In the third phase, the post graduate student operates independently

assisted by senior post graduate student or a faculty member. She/he is required to be proficient in some operations and show familiarity with others.

**OPD:** Each post graduate student may be allotted beds in the in-patient section depending upon the total bed capacity and the number of the post graduates.

The whole concept is to provide the post graduate student increasing opportunity to work with increasing responsibility according to seniority. A detailed history and case record is to be maintained by the post graduate student.

### **Additional Teaching-Learning :**

**Lecture sessions** on basic sciences, biostatistics, research methodology, teaching methodology.

**Lecture :** health economics, Medical ethics and legal issues related to ophthalmology practice.

**Workshop:** Hospital waste management,

<b>Days</b>	<b>Clinical 9.00am to 1.00pm</b>	<b>Academic 3.00pm to 5.00pm</b>
Monday	OPD	Group Discussion
Tuesday	Operation theatre	Case Presentation
Wednesday	Ward round	Journal Club/ Debate session once a month
Thursday	OPD	Seminar/Symposium
Friday	Operation theatre	skill Lab
Saturday	Grand rounds	Simulation center

### **ASSESSMENT:**



## **FORMATIVE ASSESSMENT**

Formative assessment should be continual and should assess medical knowledge, patient care, procedural & academic skills, interpersonal skills, professionalism, self directed learning and ability to practice in the system.

## **GENERAL PRINCIPLES**

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills. The Internal Assessment should be conducted in theory and clinical examination.

### **1. Internal evaluation:**

During the course of three years, the department will conduct three tests. Two of them will be annual, one at the end of first year and other at the end of second year.

The third test will be a preliminary examination held three months before the final examination. The test may include the written papers, practicals / clinicals and viva-voce. Records and marks obtained in such tests will be maintained by the head of the department and will be sent to the University when called for. Results of all evaluations should be entered into P.G's logbook / diary and departmental file for documentation purposes. Main purpose of periodic examination and accountability is to ensure clinical expertise of students with practical and communication skills and balance broader concept of diagnostic and therapeutic challenges.

### **2. Maintenance of Log Book:**

Every candidate shall maintain a Log book/work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any, conducted by the candidate. All the procedures performed by the post graduate students should be entered in the Log book. All the daily activities including the ward rounds and the routine procedures performed on day to day basis should be entered in the Log book and it should be verified and signed by the faculty member. The Log book shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the University practical/clinical examination.

**Quarterly assessment during the MS training should be based on following**

**educational activities:**

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning -
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

**The student to be assessed periodically as per categories listed in postgraduate student appraisal form (Annexure I)**

**1. Eligibility requirements for PG students in Board Speciality for appearing in University examination:**

- A post-graduate student of a degree course in broad specialties would be required to have minimum one poster presentation or one podium presentation at a National/Zonal/state conference of the respective specialty.
- A post-graduate student of a degree course in broad specialties would be required to have one research paper published/accepted for publication as the first author in the journal of the respective specialty to make him eligible to appear in the post-graduate degree examination.

All post-graduate students shall complete an online course in Research Methodology. ii. The students shall have to register on the portal of the designated training institutions. iii. The students shall complete the course in the first year.

All post-graduate students shall complete course in Ethics including Good Clinical Practices and Good Laboratory Practices, whichever is relevant to them, to be conducted by institutes/universities.

All post-graduate students shall complete a course in Basic Cardiac Life Support (BCLS) and Advanced Cardiac Life Support (ACLS) skills to be conducted by the institute. ii. The students shall complete the course in the first year.

Attendance 80% mandatory.

**SUMMATIVE ASSESSMENT, i.e., assessment at the end of training**

The summative examination would be carried out as per the Rules given in **POSTGRADUATE MEDICAL EDUCATION REGULATIONS, 2023.**

**CRITERIA FOR EVALUATION OF M.S COURSE**

Description	M.S.
<b>THEORY</b>	
• No. of Theory papers	04
• Marks for each Theory paper	100

Total marks for Theory papers	<b>400</b>
Passing minimum for Theory	200/400 (40% minimum in each paper)
<b>PRACTICAL / CLINICAL</b>	<b>300</b>
<b>VIVA VOCE</b>	<b>100</b>
Passing minimum for Practical / Clinical & Viva Voce	<b>200 / 400</b>
<p>The candidate shall secure not less than 50% marks in each head of passing which shall include</p> <ol style="list-style-type: none"> <li>1. Theory – aggregate 50% (In addition, in each Theory paper a candidate has to secure minimum of 40%)</li> <li>2. Practical/Clinical and Viva voce - aggregate 50%</li> <li>3. If any candidate fails even under one head, he/she has to re-appear for both Theory and Practical/Clinical and Viva voce examination.</li> <li>4. Five per cent of mark of total marks of Clinical/Practical and Viva Voce marks (20 marks) will be of dissertation/thesis and it will be part of clinical/practical examination marks. External examiner outside the state will evaluate dissertation/ thesis and take viva voce on it and marks will be given on quality of dissertation/thesis and performance on its viva voce.</li> <li>5. No grace mark is permitted in post-graduate examination either for theory or for practical</li> </ol>	

### **Thesis:**

Every post graduate student shall carry out work on an assigned research project under the guidance of a recognized Post Graduate Teacher, the result of which shall be written up and submitted in the form of a Thesis. Work for writing the Thesis is aimed at contributing to the development of a spirit of enquiry, besides exposing the post graduate student to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.

Thesis shall be submitted at least six months before the Theory and Clinical / Practical examination. The thesis shall be examined by a minimum of three examiners; one internal and two external examiners, who shall not be the examiners for Theory and Clinical examination. A post graduate student shall

be allowed to appear for the Theory and Practical/Clinical examination only after the acceptance of the Thesis by the examiners. From regulations)

### **Theory Examination:**

The examinations shall be organized on the basis of 'Grading' or 'Marking system' to evaluate and to certify post graduate student's level of knowledge, skill and competence at the end of the training. Obtaining a minimum of 50% marks in 'Theory' as well as 'Practical' separately shall be mandatory for passing examination as a whole. The examination for M.D./ MS shall be held at the end of 3rd academic year. An academic term shall mean six month's training period.

### **SCHEME OF EXAMINATION:**

Candidates will be allowed to appear for examination only if attendance (Minimum 80%) and internal assessment are satisfactory and dissertation is accepted.

#### **Theory: 400 Marks**

There shall be **four** papers, each of three hours duration. Total marks of each paper will be 100. Questions on recent advances may be asked in any or all the papers. The format of each paper will be same as shown below.

Type of Questions	No. of Questions	Marks for each question	Total Marks
Short essay	10	10	100
Grand Total			100

#### **Paper I :**

1. Basic Sciences : Anatomy; Physiology; Pathology; Microbiology;  
Biochemistry
2. Optics and Refraction.
3. Ocular motility and Strabismus
4. Ocular Pharmacology
5. Instrumentation and Investigations in Ophthalmology

**Paper II :**

1. Clinical ophthalmology covering Diseases of the Eye: Disorders of  
Conjunctiva,  
Cornea, Sclera, Uvea, Lens, Glaucoma, Retina, Optic nerve.
2. Clinical ophthalmology covering Diseases of the Adnexa: Disorders of  
Lids,  
Lacrimal system, Orbit.

**Paper III :**

1. Ocular Immunology
2. Neuro-ophthalmology
3. Paediatric Ophthalmology
4. Systemic ophthalmology
5. Recent Advances

**Paper IV:**

1. Surgical Ophthalmology
2. Community Ophthalmology

3. Ophthalmic research.

4. Recent advances

Note: The distribution of chapters/ topics shown against the papers are suggestive only and may overlap or change.

### **3. Clinical/Practical and oral/viva voce examination**

#### **Clinical Examination: 300 Marks**

To elicit competence in clinical skills and to discuss differential diagnostic therapeutic aspects.

<b>Type of Cases</b>	<b>Number of Cases</b>	<b>Marks for each Case</b>	<b>Total</b>
Dissertation		20	20
OSPE	5 stations	05	25
Long Case	01	100	100
Short Case	02	40	80
Fundus Case	02	25	50
Refraction Case	01	25	25
<b>GRAND TOTAL</b>			<b>300</b>

#### **Viva- Voce Examination: 100 Marks**

Oral/Viva voce Examination shall be comprehensive enough to test the post graduate student's overall knowledge of the subject and shall include:

All examiners will conduct viva – voce conjointly on the candidates' comprehension, analytical approach, expression and interpretation of data.

**Viva- voce shall include questions on the following topics:**

- a. Surgical instruments & techniques
- b. Pathology slides and Pathology gross specimens
- c. Drugs, X-rays, USG/OCT/CT/MRI Scans, etc.
- d. Visual fields and other ophthalmic diagnostic charts / Indirect ophthalmoscopy drawings / Hess screen charts
- e. General ophthalmology
- f. Community ophthalmology

### **Dissertation Evaluation**

External examiner outside the state will evaluate dissertation / thesis and take viva voce on it and marks will be given on quality of dissertation / thesis and performance on its viva voce.

### **D. Maximum marks**

<b>Maximum marks for M.S. in Ophthalmology</b>	<b>Theory</b>	<b>Practical</b>	<b>Viva</b>	<b>Grand Total</b>
	400	300	100	800

University shall conduct not more than 2 examinations in a year, with an interval not less than 4 months and not more than 8 months between the two examinations

### **Recommended Reading:**

#### **Books (latest edition)**

1. Ophthalmic Surgery: Principles and Techniques. Blackwell Science. Albert DM.
2. Principles and Practice of Ophthalmology. Albert DM, Jakobiec. W B Saunders
3. Principles & Practice of Ophthalmology. Gholam A Paymen
4. The Current American Academy of Ophthalmology Basic and Clinical Science Course (13 volumes)
5. Duke Elder's Practice of Refraction. Abrams D. Churchill Livingstone.

6. Text book of Ophthalmology. Yanoff and Duker
7. Retina. Stephen J Ryan:
8. Ophthalmic Ultrasound: Sandra Byrne and Ronald Green.
9. Cornea: Fundamentals, Diagnosis, and Management. Krachmer JH, Mannis MJ, Holland EJ. Mosby Elsevier.
10. Ophthalmology. Yanoff N, Duker JS. Mosby Elsevier.
11. Review of Ophthalmology. Friedman NJ, Kaiser PK, Trattler WB. Elsevier Saunders, Philadelphia.
12. Corneal Transplantation. Vajpayee RB. Jaypee Brothers Medical Publishers (P) Ltd, New Delhi.
13. Fundamentals of Clinical Ophthalmology Series. Coster D. Cornea. Blackwell Publishing Limited.
14. The Contact Lens Manual. A practical guide to fitting. Gasson A, Morris A J. Butterworth Heinemann Elsevier.
15. Steinert's cataract surgery.
16. Shields Text book of glaucoma
17. Smith and Nozik : Uvea
18. Rootman's diseases of the orbit
19. Eyelid, conjunctival and orbital tumors. An atlas and textbook. Shields JA, Shields CL. Philadelphia: Lippincott Williams & Wilkins.
20. Intraocular tumors. An atlas and textbook. Shields JA, Shields CL.
21. Pediatric Ophthalmology. Taylor and Hoyt: Saunders Ltd.
22. Management of Strabismus and Amblyopia. Pratt-Johnson and Tilson: Thieme Verlag.
23. Handbook of Pediatric Eye and Systemic disease. Wright, Spiegel and Thompson.
24. Binocular Vision and Ocular Motility. Theory and Management of Strabismus. Von Noorden GK. Mosby.
25. Surgical Management of Strabismus. Helveston:
26. Strabismus: A Decision Making Approach. Von Noorden and Helveston:
27. Thyroid Eye Diseases. Char DR. Williams and Wilkins, Baltimore.
28. A Manual of Systematic Eyelid Surgery. Collin JRO (ed). Churchill Livingstone, Edinburgh.
29. Refractive Surgery. Agarwal A, Agarwal A, Jacob Soosan. Jaypee.
30. LASIK Complications, Prevention and management. Gimbel HV, Penno EEA.



Slack Inc.

31. Management of Complications of Refractive Surgery. Alio JL, Azar DT. Springer.
32. Quality of Vision: Essential Optics for the Cataract and Refractive Surgeon. Holladay JT. Slack Inc.
33. Ocular Pharmacology: Havener
34. Anatomy: Wolff 's Anatomy of the Eye and Orbit
35. Physiology: Adler's Physiology of the Eye
36. Textbook of Ophthalmology (2 volumes). Easly DL, Sparrow JM. Oxford Oxford Medical Publications.
37. The Eye. Basic Sciences in Practice. Forrester JV, Dick AD, McMenamin PG, Lee WR. W B Saunders.
38. A Stereoscopic Atlas of Macular Diseases: Diagnosis and Treatment. Gass JDM.
39. Neuroophthalmology. Glaser JS. LipincottWilliams & Wilkins. .
40. Clinical Ophthalmic Pathology. Harry J, Misson G. Butterworth/Heinemann.
41. Inherited Retinal Diseases. A Diagnostic Guide. Jimenez Sierra JM, Ogden TE, Van Boemel GB. Mosby.
42. Clinical Ophthalmology. Kanski JJ. Butterworth/Heinemann.
43. ABC of Resuscitation. Colquhoun, M. C., Evans, T. R., Handley, A. J. BMJ Publishing Group.
44. Walsh and Hoyt's Clinical Neuroophthalmology (5 volumes). Miller NR, Newman NJ, Williams and Wilkins.
45. The human eye. Oyster CW Sinauer Associates. Sunderland. Massachusetts
46. Paediatric Ophthalmology. Taylor D. Blackwell Science.
47. Decision Making in Ophthalmology. Van Heuven WAJ, Zwann J. Mosby.
48. Parsons' Diseases of the eye. Sihota and Tandon.
49. Wills Eye Manual
50. International Council of Ophthalmology Residency Curriculum available at <http://www.icoph.org/>

### **Journals**

03-05 international Journals and 02 national (all indexed) journals

## **Annexure I**

**Postgraduate Students Appraisal Form**  
**Pre / Para /Clinical Disciplines**

**Name of the Department/Unit :**

**Name of the PG Student :**

**Period of Training : FROM.....TO.....**

Sr.No. PARTICULARS		Not Satisfactory	Satisfactory	More Than Satisfactory	Remarks
		1 2 3	4 5 6	7 8 9	
1. Journal based / recent advances learning					
2. Patient based /Laboratory or Skill based learning					
3. Self directed learning and teaching					
4. Departmental and interdepartmental learning activity					
5. External and Outreach Activities / CMEs					
6. Thesis / Research work					
7. Log Book Maintenance					

**Publications Yes/ No**

Remarks\* \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**\*REMARKS:** Any significant positive or negative attributes of a postgraduate student to be mentioned. For score less than 4 in any category, remediation must be suggested. Individual feedback to postgraduate student is strongly recommended.

**SIGNATURE OF ASSESSEE**

**SIGNATURE OF CONSULTANT**

**SIGNATURE OF**

**HOD**

# COMPETENCY BASED DYNAMIC CURRICULUM FOR

2<sup>nd</sup>

## BHMS PROFESSIONAL COURSES

(Applicable from Batch 2022-2023 onwards for 5 years or until further notification by  
National Commission for Homoeopathy whichever is earlier)



**HOMOEOPATHY EDUCATION BOARD**

**NATIONAL COMMISSION FOR HOMOEOPATHY**

**MINISTRY OF AYUSH, GOVERNMENT OF INDIA**

JAWAHAR LAL NEHRU BHARTIYA CHIKITSA AVUM HOMOEOPATHY ANUSANDHAN BHAVAN

No.61-65, Institutional Area, opp. 'D' block, Janak Puri, New Delhi-110 058

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## **PREAMBLE TO THE COMPETENCY BASED DYNAMIC CURRICULUM**

The National Commission for Homoeopathy (NCH) has undertaken major revisions in the educational regulations in the last year and has devised a new Syllabus to ensure that the student who completes the homoeopathic undergraduate course grows into a homoeopathic physician who is informed and capable of performing as a professional with competency to deliver services as required for addressing the health needs of the person and society at large. It is based on the premise that a correct adherence to homoeopathic principles and knowledge imparted will enable the physician to deliver results in all aspects of health, viz. preventive, promotive, curative and rehabilitative.

There is a significant change in the approach and contents in the newly designed curriculum, with the intention of making it more coherent for the present and future needs of society. The designing of curriculum is based on the sound theories of educational methodology as applicable for the health professionals' education, and therefore, the outcomes are quite transparent and achievable.

The Homoeopathic Education Board (HEB) is obliged by the NCH Act 26 (b) to “develop a competency based dynamic curriculum for Homoeopathy at all levels in accordance with the regulations made under this Act, in such manner that it develops appropriate skill, knowledge, attitude, values and ethics among the graduates, postgraduate and super-specialty students and enables them to provide healthcare, to impart medical education and to conduct medical research”.

Competency based medical education (CBME) has been around in the medical world for more than three decades. It has undergone several revisions and adaptations through this period which has placed the NCH in an advantageous position to learn from the varied experiences of curriculum formulation, implementation and assessment.

It should be emphasized that the switch over to CBME involves a sea change in the understanding of the processes and outcomes for which all stakeholders need to be adequately sensitized and the teachers trained to minimize the difficulties inevitable in any transition. The following four pillars need a special mention to grasp the nature of the change being brought about (Frank Jason R, et al 2010).

1. The focus is on ensuring that the end user of the health care services is benefited. Hence it is important that the outcomes of the training are defined in clear terms so that the teacher, the student and the community are aware of what can be expected from the training.
2. The second logical focus is on bringing the abilities of the physician to the level when the outcomes defined above are realized. This involves the definition of the competencies required in the discharge of various functions of the physician. This would involve certain domains of competencies to be achieved. This coupling of the outcome and abilities leads automatically to the third pillar.
3. We have been used to consider all training as time bound as the BHMS course is 5 1/2 years duration. But when we realize that the rate of mastering different abilities would vary from student to student, we should de-emphasize the fixed period of training and instead look at how the student can be helped to master the specific competency.
4. The fourth pillar becomes the student herself/himself. The entire education and training become learner centered and hence the teacher takes a great effort in defining the outcomes, competencies, teaching and learning methods and most important of all, assessment which is predominantly formative and hence intends to shape the evolving capacities of the learner.

While formulating the competency based dynamic curriculum (CBDC) for the homoeopathy undergraduate, we must bear in mind the central role that homoeopathy philosophy and the principle of holistic care plays in the therapeutic actions of the homoeopathic interventions. This is a distinctive aspect which has hardly received the attention it deserves despite Hahnemann's clear recommendations in the first six Aphorisms of the Organon. The revised syllabus has brought this change and the formulation of the competency-based curriculum provides an opportunity to incorporate this approach at all levels of teaching and training. The implications lie in bringing about a sensitive and effective integration (horizontal/vertical/spiral) of all aspects of the syllabus throughout the five and half years of the undergraduate course.

There are five compelling factors that form the fulcrum to drive the change (Harris Peter, et al, 2010):

1. Design of curriculum: This needs careful attention due to its novelty. Homoeopathy, as a holistic discipline resting on the foundations of philosophy, needs a holistic approach from the first year itself. Several novel situations will need to be envisaged and catered to. And yet, a number of issues will remain. This is the dynamic nature of the enterprise, and we must be prepared to accept the well-known adage: Change, the only constant!
2. Teacher training: Our teachers have discharged the role of information providers and the teaching-learning process calls for a transformation in the role of the teacher (Sidhu Navdeep S. et al 2022). The future will need them to wear multiple hats and hence they will need to develop competencies viz. planner, facilitator, assessor, education manager, role model, etc, to be effective for these roles.
3. Assessment: Assessment practices must be based on a robust platform of validity, reliability, and objectivity, so that the tools of assessment blend fluidly with the academic flow. In this background, the focus is to shift the assessment approach from the monopoly of summative assessment to a significant allowance for formative assessment, which are supportive for learning and correction on-the-go.
4. Student issues: Along with the parents and the community, a significant re-orientation is called for while changing it from that of a 'last-minute' sprinter to a long range 'racer'! All stakeholders should be on the same page so that the processes can operate in a well-oiled manner. Glitches are to be expected when a largely 'rights' based social mind set has to shift gears to adopt a competency oriented one. Understanding that change needs patience and good will go a long way to make the latter orientation a way of life.
5. Systems: All educational systems from the colleges to universities need to incorporate the multiple changes within their systems. We are used to consider results as 'pass' and 'fail' with the latter carrying the stigma. While there is an expressed need to wish to cater to all categories of learners – fast, normal, slow – the need to bring about changes in the systems is not so readily accepted. The institutions need to develop as 'learning organisations' that spur the 'growth mind-set' of its members – the teachers, students, and all those who are in the loop of curricular or co-curricular management.

The HEB considers the CBDC as a work in progress. Considerable thoughts and efforts are invested into the design and planning of the curriculum. But as has been mentioned above, this is a pioneering work and would always benefit from suggestions that spring from critical thinking and reflection subsequent to sincere attempts in implementation.

The next sections provide details of operational clarity to implement the program. Training of teachers is the key component which will make all the difference. The NCH is committed to make it happen and the cooperation of all stakeholders is earnestly solicited.

## References

1. Frank Jason R, et al (2010) Competency-based medical education: theory to practice, *Medical Teacher*, 32:8, 638-645, DOI: 10.3109/0142159X.2010.501190
2. Harris Peter, Linda Snell, Martin Talbot, Ronald M. Harden & for the International CBME Collaborators (2010) Competency-based medical education: implications for undergraduate programs, *Medical Teacher*, 32:8, 646-650, DOI: 10.3109/0142159X.2010.500703
3. Sidhu Navdeep S. et al (2022): Competency domains of educators in medical, nursing, and health sciences education: An integrative review, *Medical Teacher*, DOI: 10.1080/0142159X.2022.2126758



## **I - STEPS TAKEN TO FORMULATE HOMOEOPATHY CBDC MANUAL**

In this section we will detail the process undertaken in the formulation of this manual. The account will be of use to the users viz. the academicians, teachers and students to better grasp the significance of the effort and the role that each would have to play. The subsequent section will outline the correct use of the manual in order to derive the maximum benefit.

### **I- Defining National Goals and Programme Outcomes**

The process of identifying competency is a complex one. Defining the outcome clearly helps in defining the relevant competency thus enabling a person acquiring it with relative ease. In case of the medical graduate, the outcome or goal is determined by the health care needs of the community as perceived by the statutory authorities and the ability of the particular health care system to respond to this need. India has a pluralistic health tradition and the community accesses the several health care systems to fulfil their multiple health needs. Scientific evidence is generally relied upon to determine and differentiate the role of each system in providing health care. This, however, may not always be forthcoming to the required degree of precision.

Considering the above, the NCH has formulated broad national goals which a Homoeopathic graduate would be expected to be able to achieve.

#### **NATIONAL GOALS:**

At the end of undergraduate program, the homoeopathic medical student should be able to:

- a. Recognize the strength of homoeopathy, its applicability and limitations in health care of society and the individual.
- b. Integrate Homoeopathy along with conventional line of treatment for effective delivery of health care.
- c. Recognize the purpose of the National Health Policy and “Health for all” as a national goal and health right of all citizens and undergo training to achieve the realization of this social responsibility
- d. Develop a scientific temper, acquire educational experience for proficiency in profession and promote healthy living based on the tenets of homoeopathy.
- e. Become an exemplary citizen by observing medical ethics and fulfilling social and professional obligations so as to respond to national aspirations.
- f. Achieve competence in the practice of homoeopathy with holistic approach, encompassing promotive, preventive, curative and rehabilitative aspects of common

diseases.

- g. Establish Homoeopathy as an evidence-based system of medicine & practice it with zeal so that it stands at par to other scientific healing methods.

The above goals, though desirable, are broad. To realize them, the student entering into the undergraduate homoeopathic programme needs to be equipped with a set of competencies which would fall in the domains of knowledge, skills and attitudes. The broad goals need to be defined in specific actionable terms which will form the Programme outcomes. These will enable all the stakeholders to be clear of the nature of functioning expected from the homoeopathic physician at the end of the training. Accordingly, the team of resource persons worked together to formulate Programme Outcomes

### **PROGRAMME OUTCOMES:**

At the end of the programme of the undergraduate studies, the homoeopathic physician must

- 1) Develop the knowledge, skills, abilities and confidence as a primary care homoeopathic practitioner to attend to the health needs of the community in a holistic manner
- 2) Correctly assess and clinically diagnose common clinical conditions prevalent in the community from time to time
- 3) Identify and incorporate the socio-demographic, psychological, cultural, environmental & economic factors affecting health and disease in clinical work
- 4) Recognize the scope and limitation of homoeopathy in order to apply Homoeopathic principles for curative, prophylactic, promotive, palliative, and rehabilitative primary health care for the benefit of the individual and community
- 5) Be willing and able to practice homoeopathy as per medical ethics and professionalism.
- 6) Discern the scope and relevance of other systems of medical practice for rational use of cross referrals and role of life saving measures to address clinical emergencies
- 7) Develop the capacity for critical thinking, self-reflection and a research orientation as required for developing evidence based homoeopathic practice.
- 8) Develop an aptitude for lifelong learning to be able to meet the changing demands of

clinical practice

- 9) Develop the necessary communication skills and enabling attitudes to work as a responsible team member in various healthcare settings and contribute towards the larger goals of national health policies such as school health, community health and environmental conservation.

Defining the Programme outcomes is a crucial step since this allows us to derive the competencies the homoeopathic graduate should possess at the end of the period of training. Care is taken to ensure that the National goals are covered as much as possible by the various aspects of the Programme Outcomes. Further, the annual course objectives for each academic year will be formulated separately based on the Courses studied and the nature of clinical or community activities undertaken each year. Accordingly, the corresponding competencies for the respective years have been defined.

### **Domains of Competencies for Homoeopathic Medical Graduate**

The training of undergraduates in homoeopathy is now based on the philosophy of enabling competencies. The graduates are expected to demonstrate professional competencies as required and relevant for basic homoeopathic practice. In this background, the domains of performance need to be clearly projected for mapping the professional performance for both training and assessment.

Therefore, drawing on the proposals made in the ACGME, and CanMEDS documents, a taxonomy of competencies for homoeopathic graduates is proposed with six domains – knowledge & scholarship; patient care; homoeopathic orientation, communication skills, practice-based learning& improvement; and professionalism.

A detailed clarity on the six domains of competencies is provided as follows:

#### **I. Knowledge and Scholarship**

*To acquire relevant and optimal levels of knowledge of the basic, clinical, and behavioural sciences, and apply these in the context of patient care.*

1. Describe the normal structure and function of the human body and each of its major organ systems.
2. Recognise the altered structure and function of major organ systems that are seen in common diseases and conditions.
3. Relate the clinical, laboratory, and radiologic manifestations of common disease

and conditions.

4. Correlate the behavioural, psychosocial, genetic, and cultural factors associated with the origin, progression, and treatment of common diseases and conditions.
5. Identify the epidemiological dimensions of common diseases and conditions within a defined population.

## **II. Patient care**

*To provide individualised therapeutic and individualised and community-wide preventive care for a range of conditions.*

1. Gather accurate, complete, and unbiased information through history taking, physical examination, and laboratory & imaging data.
2. Interpret the symptoms and correlate them with the outcomes of physical examination, and laboratory & imaging data.
3. Prioritise the outcomes of interpretation to prepare the basis for patient care decisions.
4. Plan for the management of therapeutic care on the basis of disease state, patient individuality, and the psycho-social influencers.
5. Plan for a community-based preventive care on the basis of socio-cultural, and health belief paradigms.
6. Engage the patients, family / care givers, and the community members to empower them for therapeutic / preventive care.
7. Provide evidence-based information for the patient and community to introspect and develop self-sufficiency for continued care.

## **III. Homeopathic orientation**

*To make evidence-based decisions that are anchored into the spirit of homeopathy for both individual and community care, and for therapeutic and preventive care.*

1. Relate the patient's history, physical examination, and laboratory & imaging data for developing a picture of homeopathic diagnosis.
2. Position the case in Hahnemann's disease classification.
3. Identify the operating school of philosophy in the case.
4. Assess the prognostic possibilities as per Dake's hypothesis.
5. Track the progress of disease and specify its current state.
6. Select the prescription approach as materia medica-based, therapeutics-based, or repertory-based.
7. In the case of repertory-based prescription, select the appropriate repertorisation medium.

8. Identify the similimum including the potency and dosage.
9. Assess the remedy reaction as per Hering's Law or Direction of Cure, and Kent's 12 Observations.
10. Manage the case in line with principles of homeopathy.

#### **IV. Communication Skills**

*Shall be able to communicate and interact effectively with patients, their families and members of the inter-professional healthcare team.*

1. Practice empathic and patient-centered interviewing and communication.
2. Obtain an accurate and complete medical history considering the patient's culture, beliefs, personal preferences and level of health literacy.
3. Communicate effectively, both orally and in writing, with patients, families and members of the healthcare team / other healthcare professionals.
4. Function as a member of a healthcare team, collaborating effectively with other healthcare professionals in caring for patients.

#### **V. Practice-Based Learning and Improvement**

*Develop the ability to investigate and evaluate their care of patients, to appraise and assimilate scientific evidence, and to continuously improve patient care based on constant self-evaluation and life-long learning*

1. Recognize strengths, deficiencies and limitations in their knowledge and skills.
2. Articulate the goals for self-regulated learning and improvement.
3. Perform learning activities that address gaps in the knowledge, skills and / or attitudes.
4. Use information technology to optimize learning.
5. Demonstrate commitment to continuously improve knowledge, skills and/or attitudes by incorporating formative evaluation and feedback into daily practice.
6. Participate in the education of patients, families, trainees, peers and other health professionals.
7. Obtain information about individual patients, populations of patients or communities of patients to improve care.
8. Practice life-long learning skills by continually identifying, analysing and implementing new knowledge, guidelines, standards, technologies, products or services.

## **VI. Professionalism.**

*Demonstrate a commitment to upholding professional duties guided by ethical principles.*

1. Demonstrate respect for patients by using the appropriate form of address, attending to a patient's comfort, displaying appropriate attire and grooming, and honouring a patient's privacy and right to make decisions.
2. Demonstrate responsibility in actions by being punctual, managing emotions when confronted with adversity and confrontation, and recognizing personal and peer impairments.
3. Demonstrate honour and integrity by being honest about role and experience level, admitting mistakes and shortcomings, appropriately attributing sources of ideas and data, and respecting boundaries between patients, peers, and educators.
4. Demonstrate reverence for human life, understanding that sympathy for suffering is a fundamental concern of the medical profession and that the needs of the patient are paramount and should govern a physician's actions.
5. Demonstrate knowledge of the principles that govern ethical decision-making and rules and regulations regarding healthcare delivery, incorporating them into clinical practice and research

Teachers implementing this curriculum shall use these guardrails to guarantee that the curriculum implementation is firmly on track, and is transparent for monitoring and verification of progress.

This now equips us to chart the competencies against the expanded functions of the homoeopathic physician in each of the areas mentioned above. The components of each of the areas has been expanded to include all actions which the trained student would be expected to undertake.

This also helps us to zero down on the tasks which the homoeopathic student would need to be trained to perform. With this background, we should be able to approach the Manual which is being issued for 2nd, 3rd and 4th BHMS. It will be noted that the 6 domains of competencies will be aligned with the specific learning objectives for each item of learning.

Considerable fresh thought has gone into the framing of this document of CBDC for 2nd, 3rd and 4th BHMS. The existing templates were unable to satisfy the very foundations on

which homoeopathic practice rests and have been extensively elaborated and modified in the Preamble to the CBDC for 2nd, 3rd and 4th BHMS. The two features which may be emphasized here are:

1. Close adherence to homoeopathic philosophy and principles at every stage of education and training
2. This in turn demands a rare amount of integration at horizontal, vertical and spiral forms

The next section will deal with how the Competency table was formulated and how it should be used.

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## II- UNDERSTANDING THE COMPETENCY TABLE

The Competency Table has been designed keeping in mind the domains of competencies required by the learner to attain the overall Program Outcomes (PO) as well as Course Outcomes (CO) of all courses.

### A. Methodology in preparation of the Competency Table

The following methodology was adopted in preparing the Competency table for each course (or subject) of 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> year of the BHMS program once the National Goals, Programme Outcomes, and domains of competencies were identified:

- ❖ Course Outcomes (CO) were identified for each course (or subject) that were in alignment with the National goals and Programme Outcomes (PO)
- ❖ Finalizing the syllabus or the list of topics which will help to achieve not only the Course Outcomes (CO) but also the overall Program Outcomes (PO)
- ❖ Aligning the competencies from the 6 domains with the content.
- ❖ Identifying the Learning Objectives and Specific Learning Objectives (SLO) for each topic.
- ❖ Identifying the level of Miller's Pyramid for each Specific Learning Objectives (SLO)
- ❖ Classifying each Specific Learning Objective (SLO) as per Bloom's Taxonomy and Guibert's Level
- ❖ Defining the priority of each Specific Learning Objective (SLO) into 'Must know' or 'Desirable to know' or 'Nice to know' categories
- ❖ Choosing the appropriate Teaching Learning method/s and media and the assessment method/s required for achieving each objective or outcome
- ❖ Identifying the Horizontal, Vertical and Spiral Integration with other courses (or subjects) required for holistic understanding of the topic

We will now illustrate how the Competency table is to be read with respect to the Community Medicine Course (subject)



## Illustrative Diagrammatic Representation of Competencies Table with example of the Community Medicine Course

Concepts of Health, Disease Causation & Prevention and Homoeopathy										
Competency No	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilbert	Priority	T-L/M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term "Health" as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

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Table 1: Description of the Competencies table

S.No	Description
1	Unique number of the competency /outcome (Hom UG CM I-T 2.1 ) Hom UG CM I-T 2.1 to be read as Homoeopathy Under Graduate Program, Community Medicine course 3rd BHMS, Theory Component Unit , Topic 2.followed by serial number of the Specific Learning Objectives (SLO)
2	Domain of Competency covered by the topic- Domain Competency: KS-Knowledge and Scholarship PC- Patient care HO- Homoeopathic orientation CS- Communication Skills PBL- Practice-Based Learning and Improvement PRF- Professionalism
3	Mapping of the Level of Specific Learning Objectives (SLO) to Miller's Pyramid- Knows (K)/ Knows How (KH)/ Shows How (SH)/ Does (D)
4	Content to be covered from the topic
5	Description of Specific Learning Objectives (SLO) for the topic
6	The Blooms Domain addressed by the Specific Learning Objectives (SLO)- Cognitive (C) or Affective (A)or Psychomotor (P) Domain and Mapping of the Specific Learning Objective (SLO) to Guilbert's Level of Learning in the Cognitive or Affective or Psychomotor Domain
7	Assigning priority to Specific Learning Objective (SLO) as per Must know (MK) or Desirable to know (DK) or Nice to know (NK) areas
8	Teaching Learning methods and media for each SLO
9	Assessment methods for each SLO classified under formative and summative assessment
10	Vertical or horizontal integration with other courses to improve understanding. If the subject is taught for more than 1 year, it must be integrated spirally in all the years.

### III. USING THE COMPETENCY TABLE

A Competency Based Dynamic Curriculum necessitates that each topic in a course (or subject) be elaborated in terms of the outcomes that are to be achieved by the learner at the end of the particular topic. This in turn will help the learner to achieve the competencies at the course and overall, at the program level.

#### 1. Linking the Specific learning Objective (SLO) to the competencies and Miller's Level

Concepts of Health, Disease Causation & Prevention and Homoeopathy										
Competency No	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilber t	Priority	T-L M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term "Health" as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

Each Specific learning Objective (SLO) will help the learner to acquire the required domains of competencies (abilities that a basic homoeopathic doctor would be trusted to have acquired as a consequence of his / her learning).

The Specific learning Objective (SLO) also indicates at what level the competency is defined in the Miller's Pyramid which in the above example is at the level of 'Knows' and 'Knows How' – the ability to recall facts and ideas and the domain of competency covered is Knowledge and

Scholarship.

## 2. Specific learning Objective (SLO) for each topic

	Concepts of Health, Disease Causation & Prevention and Homoeopathy									
Competency No.	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilbert	Priority	T-L M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term “Health” as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

Specific Learning Objectives (SLOs) start with the "Action Verb" as per the Domain and level and describe what students should know or be able to do at the end of a learning session.

### 3. Bloom/ Guilbert's level of SLO

	Concepts of Health, Disease Causation & Prevention and Homoeopathy									
Competency No	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilbert	Priority	T-L M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term “Health” as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

The SLOs are written as per the Blooms Domain (Cognitive or Affective or Psychomotor) under which they are categorized.

In the above example three Specific Learning Objectives (SLOs) have been described that belong to the Cognitive domain.

They are then mapped to Guilbert's Level of Learning in the Cognitive or Affective or Psychomotor Domain.

In the above example, the first two SLOs belong to level-II of Guilbert's level of learning under cognitive domain whereas the third SLO belongs to level-I of Guilbert's level of learning under cognitive domain.

#### 4. Priority of Learning of SLO

Concepts of Health, Disease Causation & Prevention and Homoeopathy										
Competency No.	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilber t	Priority	T-L/M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term “Health” as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

The priority of learning is represented as ‘Must know’, ‘Desirable-to-know’, and ‘Nice-to-know’. Prioritization is a critical component of curriculum design because it classifies the specific learning objectives on the basis of their importance and usefulness for the ultimate professional standards. The priority of learning is objectively assigned by a formula that gives weightage on the basis of multiplying ‘frequency and impact’ of the learning for professional needs.

In the above example, all the three SLOs are ‘Desirable to Know’.

## 5. Teaching Learning methods and media for each topic

Concepts of Health, Disease Causation & Prevention and Homoeopathy										
Competency No	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilber	Priority	T-L M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term "Health" as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

The Teaching- Learning methods and media have been identified that are most suitable to the Specific Learning Objectives (SLOs) formed for each topic and as per the Domain of each of the Specific Learning Objectives (SLOs).

In the above example, Lectures, Small Group Discussions are the Teaching- Learning methods to be adopted for achieving the SLO. The media could be projectors, models, whiteboard etc.

The Teaching Learning Methods and media will vary as per the Specific Learning Objectives (SLO) and the Domains they cover.



## 6. Assessment methods for each topic

Concepts of Health, Disease Causation & Prevention and Homoeopathy										
Competency No	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilber t	Priority	T-L M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term “Health” as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

The Assessment methods have been identified that are most suitable to the Specific Learning Objectives (SLOs) formed for each topic and as per the Domain of each Specific Learning Objectives (SLOs) to assess the learner.

In the above example, Multiple Choice Questions (MCQ), Short Answer Questions (SAQ), Viva Voce and Quiz are the assessment methods to be adopted for assessing the SLO. The Assessment Methods will vary as per the SLO and the Domain it covers.

They are further classified into formative and summative assessment methods.



Formative assessment methods will be used at the end of every topic to assess whether the student has achieved the desired SLOs and give feedback. In the above example, MCQ's, Viva, Quiz are the formative assessment methods to be used to assess the particular SLOs.

Summative assessment methods will be used to assess the student on a particular topic for internal assessment and the Final University Examination. In the above example, MCQ's, SAQ's are the summative assessment methods that would be used to assess whether the student has achieved these SLOs.

## 7. Integrated Learning

Concepts of Health, Disease Causation & Prevention and Homoeopathy										
Competency No	Domain of Competency	Miller	Content	Specific Learning Objectives	Bloom/Guilbert	Priority	T-L/M/M	Assessment		Integration
								Formative	Summative	
Hom UG CM I-T 2.1	KS	KH	Concept of health	Discuss the history of health  Discuss the biomedical, ecological, psychological, and spiritual dimensions of holistic health	C-II	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ, SAQ	Organon of Medicine
Hom UG CM I-T 2.2	KS	K	Health	Define the term "Health" as per WHO.	C-I	DK	1. Lecture 2. Small Group Discussion	MCQ Viva Quiz	MCQ,	

Horizontal or Vertical Integrated Learning with other subjects is required for a holistic understanding of the topic from different points of view.

In the above example, the above topic should be integrated with Organon of Medicine for better understanding of the topic.

Spiral integration is required as the subject will be taught in II, III and IV BHMS.

Legend: Abbreviations

Sr. No	Acronym	Description
1.	PO	Programme outcomes
2.	CO	Course outcomes
3.	ACO	Annual Course Objectives
4.	SLO	Specific Learning Objective
5.	KS	Knowledge and Scholarship
6.	PC	Patient Care
7.	HO	Homoeopathic Orientation
8.	CS	Communication Skills
9.	PBL	Practice Based Learning and Improvement
10.	PRF	Professionalism
11.	K	Knows
12.	KH	Knows How
13.	SH	Shows How
14.	D	Does
15.	C-I/II/III	Cognitive Domain- Guilbert's Level-I/II/III
16.	P-I/II/III	Psychomotor Domain- Guilbert's Level-I/II/III
17.	A-I/II/III	Affective Domain- Guilbert's Level-I/II/III
18.	MK	Must Know
19.	DK	Desirable to Know
20.	NK	Nice to Know
21.	MCQ	Multiple Choice Question
22.	SAQ	Short Answer Question

23.	LAQ	Long Answer Question
24.	OSPE	Objective Structured Practical Examination
25.	OSCE	Objective Structured Clinical Examination

#### **IV- Glossary of terms used in the template.**

##### Goals

These are broad outcomes expected of a student at the end of the course of studies. These are to be contrasted with Objectives/Outcomes which are more specifically and narrowly defined.

##### Programme

A range of learning experiences offered to students in a formal manner over a period of one-to-four years leading to certificates/ diplomas/ degrees. Examples: BA (Economics) BSc (Physics). All possible formal degree Programmes are identified by UGC. BHMS is one such Programme

##### Programme Outcome

Programme Outcomes (POs) are what knowledge, skills and attitudes a graduate should have at the time of graduation. The Programme Outcomes of professional disciplines are identified at national level by the concerned accrediting agency. In this case, it would be the National Commission of Homoeopathy which would be involved.

##### Course

Course for the purpose of this Manual represents a subject e.g. Anatomy. In homoeopathic education some of the courses extend over several years e.g. Materia Medica. The relevance of this is in the formulation of Course Outcome

##### Course Outcome

Course Outcomes are statements that describe what students should be able to do at the end of a course. Where a Course extends over a number of years, it is necessary to define distinct Course Outcomes over the entire teaching programme of the subject. These will vary in depth and extent of the coverage of the subject.

### Annual Course Objectives (ACO)

Annual course objectives are overarching goals or outcomes that educators set for an academic course to guide teaching, learning, and assessment for the particular year. These objectives serve as a roadmap for both teachers and students, outlining what is expected to be achieved by the end of the year in the course. They typically encompass the essential knowledge, skills, and competencies that students should acquire within the specified timeframe.

### Competency

An observable ability of a health professional, integrating multiple components such as knowledge, skills, values, and attitudes. Since competencies are observable, they can be measured and assessed to ensure their acquisition.

### Content:

Content is the group of sub-topics to be covered under each broad topic.

### Millers Levels:

Miller's Pyramid is a diagrammatic representation of the convergence of learning. It maps the pathway of learning to show a person gains the ability and competence in a series of increasingly progressive phases of learning.

The broad base of this pyramid - 'Knows' – has the ability to recall facts and ideas that form the bedrock of professional requirements. 'Knows How' is the next phase of learning, where the students gains the insight into the relationships between the various units of 'knows' and can relate them meaningfully to reach the 'knows how' capacity. These phases would largely be in the Cognitive Domain of Bloom's Taxonomy of Learning Objectives.

Learning is not just about knowing and knowing how, but also to enable that the 'know how' is put into practice. This is the third phase of Miller's Pyramid – the 'Shows How'. During this phase of learning, the student is able to demonstrate the reasoning ability that he / she has acquired in controlled or real situations. This ability also includes the psychomotor dimension of Bloom's Taxonomy. The summit of pyramid, i.e., 'Does' also includes the emotional aspect

of learning in the form of values, attitudes, communication, etc, that denote the ‘Affective Domain’ of Bloom’s Taxonomy.

The Miller’s Pyramid is a valuable tool to represent the increasing levels of competencies that the students need to acquire, and also a framework to assess the level of competency that is achieved. Interestingly, the framework focuses on what the learner would be doing, rather than on what the teacher would be doing.

### Specific Learning Objectives:

Specific Learning Objectives / Outcomes (SLOs) describe what students should know or be able to do at the end of a learning session, that they couldn't do before. These are written and communicated in a ‘low context communication style’, that is to say, whoever reads the SLO would have the same understanding that the person who wrote it had. That is, there would be no communication gap.

That is the reason why the SLOs are written specifically and exclusively as units of learning in one of the domains of Bloom, and further at one of the levels of Guilbert. This will ensure that the learning that is expected is clearly communication among all those who refer to it, including those who set the assessment and evaluate the student performance. Further, the SLOs are ALWAYS written with an ACTIVE verb, so as to make the statement observable and measurable.

### Bloom’s domain:

Bloom’s Taxonomy of Educational Objectives is a tool for classifying learning under the categories of ‘knowledge’, ‘skill’, and ‘attitude / value / communication’, represented by the technical terms ‘Cognitive’, ‘Psychomotor’, and ‘Affective’ domains respectively. Each of these domains distinguish the dimension of learning in a particular area. The importance of such classification is that it offers a clear model for both teaching and students’ assessment.

### Guilbert’s level:

Guilbert’s Hierarchy is a tool that describes the various levels of learning that can be mapped and managed in the Bloom’s domains of learning – cognitive, psychomotor, and affective. This tool also has the additional benefit to identify the appropriate teaching – learning methods / media, and also the assessment strategies.

In the 'knowledge' domain Guilbert's approach to learning proceeds from recall of facts to understanding / interpreting the different sets of data, and finally to the ability to make decisions and solve problems on the basis of the understanding / interpretation. This simple three-step process builds a sequential order of learning; it clearly brings out that decisions shall be made NOT on the basis of facts alone, but through a process of understanding and interpretation.

The 'skill' domain builds the learning from the stage of observing and imitation to gaining control over the skills and culminating in automatism of the skill. In simple terms, any skill will be learnt initially by observing its performance, and imitating the same in the sequential order. In the next phase, the learner tries to gain control over the skill initially under the supervision, and ultimately will be able to perform it independently.

Learning in the affective domain proceeds from the stage where the learner is open and receptive to the stimulus or trigger situation, responding to it in a desirable manner, and finally internalizing the responses.

#### Priority of learning:

The priority of learning is represented as 'Must know', 'Desirable-to-know', and 'Nice-to-know'. Prioritization is a critical component of curriculum design because it classifies the learning outcomes on the basis of their importance and usefulness for the ultimate professional standards. The priority of learning is objectively assigned by a formula that gives weightage on the basis of 'frequency and impact' of the learning for professional needs.

#### TL Method / Media:

The teaching-learning (TL) methods and media are the vehicles that enable the acquisition of stated outcomes. Teaching method is simply 'what the teacher does or what the teacher enables the students with', such as giving a lecture, conducting a demonstration, or facilitating a group discussion. Teaching-learning media is 'what the teacher or the students use' to enable the learning; with examples such as a board, or projector, or model, or specimen, among others.

The teaching-learning methods and media are specific to the domains and levels in the domains. It must also be remembered that learning is a continuum, and a range of methods and media would be appropriate in the different phases in the continuum of learning.

#### Assessment:

Assessment of learning is an important component of curriculum. This measures the

performance of the students in comparison to the expected outcomes of learning. Therefore the specific learning outcomes must be stated and communicated clearly and objectively to all the stakeholders of education. Assessment strategy is based on the domain and the level of domain in which the outcome is to be measured. Assessment could be judgemental for the extent and quality of outcomes, when it is called ‘assessment of learning’, or it could also be supportive for learning, when it is called as ‘assessment for learning’. There are two major approaches to assessment – formative, and summative. The tools of assessment are provided in the annexure.

#### Formative Assessment:

Formative assessment is NOT judgmental, in that it does not brand the learner as ‘pass’ or ‘fail’. The formative assessments measure the extent and quality of learning with reference to the expected learning outcomes, so that the students can be given feedback to improve on their performance. The formative assessments promote mastery learning, that is to say, each student achieves the stated level of mastery of performance because of the feedback and support. Formative assessment is also called as continuous assessment.

#### Summative Assessment:

Summative assessment has the mandate to judge the achievement of the learner at the end of a period of learning, and label him / her as ‘pass’ or ‘fail’, assign a rank, approve for eligibility to be promoted or eligibility to be admitted to a course. These assessments also serve as quality check to ensure that those who are being certified conform to a minimum standard of professional competence.

#### Objective Structured Practical Examination:

The Objective Structured Practical Examination (OSPE) is a type of assessment commonly used in medical education. It's designed to evaluate a student's practical skills and competencies in a structured and standardized manner.

In an OSPE, students rotate through a series of stations, each presenting a different task or scenario. These stations typically involve procedural techniques, or interpretation of diagnostic tests. At each station, students are assessed based on predefined criteria and checklist.



### Objective Structured Clinical Examination:

The Objective Structured Clinical Examination (OSCE) is a widely used method of assessing clinical skills in medical education. It's designed to evaluate various competencies such as clinical reasoning, communication skills, physical examination techniques, and professionalism in a standardized and objective manner.

In an OSCE, candidates rotate through a series of stations, each representing a different clinical scenario or task. At each station, candidates are typically required to interact with simulated patients, perform specific clinical tasks, or respond to clinical questions within a set time frame, usually ranging from 5 to 15 minutes per station.

Scenarios can cover a wide range of clinical contexts, including history-taking, physical examination, clinical decision-making, counseling, and procedural skills. Trained assessors evaluate candidates based on predefined criteria, often using structured checklists or rating scales to provide consistent and objective feedback.

### Integration:

Integration of learning is an essential requirement for aligning various data points of knowledge and skills for getting a holistic understanding and enabling a unified performance. Integration can be achieved at various dimensions and at various levels.

The dimensions of integration could be temporal in the form of Horizontal, Vertical, or Spiral. Horizontal integration is the alignment of learning on a longitudinal timeline, where the comparable contents of various subjects in the same term or year are integrated.

Vertical integration is seen in the subjects that build on the pre-existing knowledge and skills of another subject. For example, the integration between clinical subjects like Practice of Medicine with the para-clinical subjects such as pathology.

Spiral integration is where a subject is recurring at various levels in the same course. For example, Materia medica is learnt from the first to final BHMS, and the focus of the subject is not the same in each year. There would be iteration of the same knowledge from different perspectives and capabilities across the different phases of BHMS.

The levels of integration represent the increasing approximation of knowledge from different

subjects, so as to reach an approximation of fusion. The attempt to integration may begin with arranging the comparable contents of different subjects at the same cross sections of timeline. Further, there could be positioning the content of one subject into another subject to bring some kind of co-existence. Still further, the contents can be seamlessly merged to create an aligned learning content. Such integrative efforts can bring about holistic learning for a meaningful homeopathic capacity-building.

**Subject:** Homoeopathic Materia Medica

**Subject code:** HomUG-HMM-II

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## **1. Preamble**

Homoeopathic Materia Medica is the study of the action of drugs on healthy human being as a whole taking into consideration individual susceptibility and its reaction to various circumstances and time. A good prescription by a Homoeopath mainly depends upon the case receiving, processing and a sound knowledge of Homoeopathic Materia Medica.

Each drug in Materia Medica not only has its own personality with its mental and physical constitution but also has its own affinity to an area, direction, spread, tissue, organ; system. Study of a drug in context of altered sensation, function and structure covers the Pathology caused by it, which is also expressed in the pathogenesis of the drugs. Materia Medica also has symptoms from Toxicological and Clinical proving. All this knowledge is of utmost importance in order to apply the remedies in various clinical conditions. This can be achieved only by integrating the study of Materia Medica with other parallel subjects taught during the course.

Apart from the source books of Materia Medica there are different types of Materia Medica constructed on different philosophical backgrounds by different authors. Materia Medica also forms the platform of various repertories. Therefore, it becomes very important for a student of Homoeopathy to learn the plan and construction of all the basic Materia Medica in order to understand their practical utility in practice.

It is also important to keep in mind that the end point of the teaching of HMM is not to burden the student with information of a greater number of remedies but to equip with an approach which will help to develop the vision towards self-guided study and apply the knowledge in practice.

This self-directed learning can ultimately lead to a critical approach of studying Materia Medica hence empowering evidence-based practice and initiate the process of lifelong learning. Exploring Materia Medica is an endless journey as newer illnesses will keep on emerging and newer drugs or undiscovered facets of existing drugs will be needed to explore for managing these situations.

## **2. Course outcomes**

- i. To grasp the basic concept and philosophy of Homeopathic Materia Medica based on Hahnemannian directions
- ii. To understand the different sources and types of Materia Medica
- iii. To mould Homoeopathic students by equipping them to readily grasp the symptoms of the sick individual corresponding to the symptoms of the drug.
- iv. To understand the drug with its pharmacological data, adaptability, sphere of action, along with characteristic sensations and functions both at level of mind and body along with doctrine of signatures.
- v. To construct the portrait of the drug with its predisposition, disposition both mental and physical, diathesis and disease expression with Miasmatic correlation and its susceptibility expression at various times taking in to consideration of the environment around him/ her.
- vi. To understand the drug from its therapeutic application in various pathological conditions and allied clinical subjects like practice of medicine, surgery, obstetrics and gynaecology.
- vii. To understand the group characteristics of the drugs and the individualizing symptoms of the individual remedies of the group.
- viii. To differentiate medicines arising from the reportorial process and to arrive at an appropriate similimum.
- ix. To grasp the concept of remedy relationship and its application in practice
- x. To understand the Miasmatic expressions and evolution in a given drug
- xi. To understand and apply the bio-chemic system of medicine in practice
- xii. To understand and apply the utility of mother tinctures in practice

### **3. Learning objectives**

At the end of BHMS II course, the students should be able to-

- i. Discuss the different approaches for studying Homoeopathic Materia Medica.
- ii. Understand the drug picture of medicines in the syllabus of II BHMS in context of its pharmacological data, constitution, temperament, sphere of action, pathogenesis, ailments from, modalities, mentals, physical generals and particulars, miasm and relationship with other remedies including the doctrine of Signature.
- iii. Integrate the knowledge of Anatomy, Physiology, Pharmacy, Psychology, Organon of Medicine, Pathology and Toxicology for the understanding of a particular drug.
- iv. Compare and contrast symptoms of similar remedies of I and II BHMS syllabus.
- v. Demonstrate the steps of case taking as per guidelines given in Organon of medicine.
- vi. Demonstrate basic physical examination skills.
- vii. Recognise the importance of interpretation of basic investigations in a given case.
- viii. Analyse the symptoms of a case to categorize them as Mentals, Physical Generals and Particulars.
- ix. Recognise the PQRS of a drug in the case taken.

### **4. Course content and its term-wise distribution (theory)**

#### **4.1 Introductory lectures**

- 4.1.1** Assessment of Entry Behaviour for I BHMS syllabus
- 4.1.2** Different approaches for studying Homoeopathic Materia Medica
- 4.1.3** Integrating the knowledge of Pathology, Toxicology, Practice of Medicine, Surgery and Gynaecology-Obstetrics in a better understanding of Homoeopathic Materia Medica

#### 4.2 Homoeopathic medicines:

1. Acetic Acid	17.Cactus Grandiflorus	33. Helleborus Niger
2. ActeaRacemosa	18. Calcarea Arsenicosa	34. Hyoscyamus Niger
3. Aesculus Hippocastanum	19.Calcarea Iodata	35. Kali Bichromaticum
4. AgaricusMuscarius	20. Camphora	36. Kali Bromatum
5. Agnus Castus	21. Cannabis Indica	37. KaliCarbonicum
6. Alumina	22. Cannabis Sativa	38.Natrum Carbonicum
7. Ambra Grisea	23. Cantharis	39. Nux Moschata
8. AnacardiumOrientalis	24. Cardus Marianus	40. Opium
9. Antimonium Arsenicosum	25. Causticum	41. Petroleum
10. ApocynumCannabinum	26. Ceanothus Americanus	42. Phosphorus
11. Arsenicum Iodatum	27. Chelidonium Majus	43. Secale Cornutum
12. Argentum Nitricum	28. Chininum Arsenicosum	44. Sepia
13. BaptisiaTinctoria	29. Digitalis Purpurea	45. Stramonium
14. Berberis Vulgaris	30. Echinacea Angustifolia	46. Thuja Occidentalis
15. Bellis Perennis	31. Equisatum Hyemale	47. Urtica Urens
16. Bromium	32. Ferrum Metallicum	48. Veratrum Album

### 4.3 Content for Term I

#### 4.3.1 Introductory Lectures:

4.3.1.1 Assessment of Entry Behavior for I BHMS syllabus

4.3.1.1.1 Different approaches for studying Homoeopathic Materia Medica

4.3.1.2 Integrating the knowledge of Pathology, Toxicology, Practice of Medicine, Surgery and Gynaecology-Obstetrics in better understanding of Homoeopathic Materia Medica

#### 4.3.2 Homoeopathic medicines:

1. Acetic Acid	9. Cardus Marianus	17. Kali Bromatum
2. Aesculus Hippocastanum	10. Causticum	18. Kali Carbonicum
3. Agaricus Muscarius	11. Ceanothus Americanus	19. Natrum Carbonicum
4. Alumina	12. Chelidonium Majus	20. Opium
5. Anacardium Orientalis	13. Chininum Arsenicosum	21. Thuja Occidentalis
6. Apocynum Cannabinum	14. EchinaceaAngustifolia	22. Urtica Urens
7. Baptisia Tinctoria	15. Helleborus Niger	
8. Bellis Perrenis	16. Kali Bichromicum	

### 4.4 Contents for Term II:

#### Homoeopathic medicines:

1. Actea Racemosa	11. Calcarea Iodatum	21. Petroleum
2. Agnus Castus	12. Camphora	22. Phosphorus
3. Ambra Grisea	13. Cannabis Indica	23. Secale Cornuatum
4. AntimoniumArsenicum	14. Cannabis Sativa	24. Sepia
5. Argentum Nitricum	15. Cantheris	25. Stramonium
6. Arsenicum Iodatum	16. DigitalisPurpurea	26. Veratrum Album
7. Berbers Vulgaris	17. EquisatumHyemale	
8. Bromium	18. Ferrum Metallicum	
9. Cactus Grandifloria	19. Hyoscyamus Niger	
10. Calcarea Aarsenicum	20. Nux Moschata	

*Non-lectures shall be equally distributed to both term I and II, as per the feasibility of individual institution*



## 5. Teaching hours

### 5.1. Gross division of teaching hours

Homoeopathic Materia Medica		
Year	Teaching hours- Lectures	Teaching hours- Non-lectures
II BHMS	150	100

### 5.2. Teaching hours theory

S. No.	List of Topics	Hours
1.	Assessment of Entry Behavior of I BHMS syllabus	2
2.	Different approaches for studying Homoeopathic Materia Medica	4
3.	Integrating the knowledge of Pathology and Toxicology, Practice of Medicine, Surgery and Gynaecology-Obstetrics in better understanding of Homoeopathic Materia Medica	2
4.	Study of Drug pictures (Term I)	70
5.	Study of Drug pictures (Term II)	72
	<b>Total</b>	<b>150</b>

### 5.3. Teaching hours Non-lecture

Sr. No	Non-Lecture Teaching Learning methods	Term	Time Allotted per Activity (Hours)
1	Clinical(to be integrated with topics under Pathology, Practice of Medicine, Surgery and ObGy)	I & II	75
2	Demonstrattion	I & II	25 (Distribution as mentioned below)
2(a)	Seminar / Tutorials		10
2(b)	Problem based learning/ Case Based Learning		10
2(c)	Assignment/ Symposium / Group discussion		5
	<b>Total</b>		<b>100</b>

## 6. Content mapping (competencies table)

### 6.1 Competencies table theory

Sl. No.	Competency	Millers Level:	Content	SLO/ Outcome	Blooms Domain / Guilbert's Level	Priority	T-L Methods/ media	Assessment		Integration
								Formative	Summative	
<b>HomUG-HMM-II-1.</b>	K & S PC HO	KH  K	Assessment of Entry Behaviour of I BHMS syllabus	Recall the knowledge of I BHMS syllabus for Materia Medica	C1	MK	Group Discussion	MCQ, viva	MCQ SAQ LAQ	<b>Spiral integration</b> with Homoeopathic Materia Medica <b>Vertical integration</b> with Anatomy, Physiology, Pharmacy, Psychology, Organon)
<b>HomUG-HMM-II-2.1</b>			Different approaches for studying Homoeopathic Materia medica	Enumerate the different approaches for studying Homoeopathic Materia medica	C2	MK	Lecture  PPT	MCQ Assignm ent	SAQ	<b>Horizontal integration</b> with subjects of Pathology , Toxicology , Physiology Organon , Anatomy , Psychology and Homoeopathic pharmacy
<b>HomUG-HMM-II-2.2</b>				Explore the scope and limitation of each approaches for studying Homoeopathic Materia Medica			Library references	Project  viva		

Sl. No.	Competency	Millers Level:	Content	SLO/ Outcome	Blooms Domain / Guilbert's Level	Priority	T-L Methods/ media	Assessment		Integration
								Formative	Summative	
<b>HomUG-HMM-II-3.</b>			Integrating the knowledge of Pathology, Toxicology, Practice of Medicine, Surgery and Gynaecology-Obstetrics in better understanding of Homoeopathic Materia medica	Integrate the knowledge of Pathology, toxicology, Practice of Medicine, Surgery and Gynaecology-Obstetrics in understanding the evolution of symptoms of remedies	C2	MK	Lecture Team teaching	MCQ Assignment Project viva	SAQ	<b>Horizontal integration</b> with subjects of Pathology Toxicology , and Organon
<b>HomUG-HMM-II-4.1</b>	K & S PC HO	KH  K	Individual Homoeopathic medicines	Mention the common name, source/ family/kingdom and the prover	C1	NK	Lecture/ Specimen	MCQ Viva	MCQ	<b>Vertical integration</b> with Pharmacy
<b>HomUG-HMM-II-4.2</b>				Correlate with doctrine of signature	C2	NK	Lecture/ Specimen	MCQ Viva	MCQ	<b>Vertical integration</b> with Pharmacy and Physiology
<b>HomUG-HMM-II-4.3</b>				List the sphere of action	C1	MK	Lecture Self – learning	Assignment Project	LAQ SAQ MCQ	<b>Horizontal</b>

Sl. No.	Competency	Millers Level:	Content	SLO/ Outcome	Blooms Domain / Guilbert's Level	Priority	T-L Methods/ media	Assessment		Integration
								Formative	Summative	
								MCQ	Viva	<b>Integration</b> with Pathology, Toxicology,
<b>HomUG -HMM-II-4.4</b>				Narrate the 'ailments from'	C1		Small Group Discussion	Viva		ObGy,PM, Surgery and Organon
<b>HomUG -HMM-II-4.5</b>				Describe the constitution and temperament	C1		Black Board			<b>Vertical integration</b> with Anatomy Pharmacy , Psychology and Physiology
<b>HomUG -HMM-II-4.6</b>				Explain the mental symptoms	C1		PPT			
<b>HomUG -HMM-II-4.7</b>				Explain the physical generals	C1		Handouts Role play			
<b>HomUG -HMM-II-4.8</b>				Outline the general modalities	C1		PBL			
<b>HomUG -HMM-II-4.9</b>				Describe the particular symptoms and modalities	C2					
<b>HomUG -HMM-II-4.10</b>				Correlate pathogenesis with knowledge of Toxicology, Pathology, Practice of Medicine, Surgery and	C2					

Sl. No.	Competency	Millers Level:	Content	SLO/ Outcome	Blooms Domain / Guilbert's Level	Priority	T-L Methods/ media	Assessment		Integration
								Formative	Summative	
				Gynaecology-Obstetrics and miasm						
HomUG-HMM-II-4.11				Mention the Relationships of medicines	C2					
HomUG-HMM-II-4.12				Compare and contrast from the related remedies of First and Second BHMS Syllabus	C2					

## 6.2 Competencies table practical/clinical

S. No.	Domain of Competency	Millers Level:	Content	SLO/ Outcome	Blooms Domain / Guilbert's Level	Priority	T-L Methods/media	Assessment		Integration
								Formative	Summative	
<b>HomUG-HMM-II-5.1</b>	K & S  PC  HO  CS	SH  KH	Case taking	Demonstrate the steps of case taking as per guidelines given in Organon of medicine.	P/A2	MK	Demonstration  Checklist	CBD  Small project	Clinical performance	<b>Horizontal Integration</b> with Pathology, ObGy, Surgery, Practice of Medicine and Organon
<b>HomUG-HMM-II-5.2</b>	PBLI  Prf		Clinical examination	Demonstrate the basic clinical examination skills	P/A2					
<b>HomUG-HMM-II-5.3</b>			Interpretation of investigation	Recognise the importance of interpretation of basic investigations.	C2					
<b>HomUG-HMM-II-5.4</b>			Case analysis	Analyse the symptoms to segregate the characteristic Mentals, Physical General and Particulars	C2					

## 7. Teaching learning methods

Lectures (Theory)	Non-lectures (Practical/Demonstrative)
Lectures	Clinical demonstration
Small group discussion	Problem based discussion
Integrated lectures	Case based learning
	Tutorials
	Seminars
	Symposium
	Assignments
	Library reference
	Self-learning



## 8. Details of assessment

### 8.1 Overall Scheme of Assessment (Summative)

Sr. No	Professional Course	Term I (1-6 Months)		Term II (7-12 Months)		
1	Second Professional BHMS	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	FUE (end of 12 months)	
		10 Marks Viva	50 Marks Practical/ Viva  i) Viva voce -25 marks ii) Clinical performance – 25 marks (Case Taking and analysis of symptoms)	10 Marks Viva	100 marks theory	100 marks (Clinical/practical+ Viva+ IA)

**PA: Periodical Assessment; TT: Term Test; FUE: Final University Examinations; IA: Internal Assessment**

## 8.2 Number of papers and marks distribution for Final University Examination (FUE)

Sr. No.	Course Code	Papers	Theory	Practical/ Clinical	Viva Voce	Internal Assessment**	Grand Total
1	HomUG-HMM-II	01	100 marks*	50 marks  i) Journal -10 marks (Five acute and 5 chronic cases)  ii) Case taking and analysis of symptoms --- 40 marks	40 marks	10 marks  (Marks of PA I + TT I + PA II)	200marks

**\*30 % of questions shall be from I BHMS syllabus and 70 % of questions shall be from II BHMS syllabus.**

**\*\*Method of calculation of Internal Assessment marks for Final University Examination:**

**Marks of IA-** (Marks of PA-1 + Marks of TT + Marks of PA-2) / 70 X 10

### 8.3 Paper Layout

#### Summative assessment (FUE): Theory- 100 marks

MCQ	10 marks
SAQ	40 marks
LAQ	50 marks

### 8.4 Distribution of questions for theory exam

Sr. No	Paper			D Type of Questions		
				MCQ (1 Mark)	SAQ (5 Marks)	LAQ (10 Marks)
	A List of Topics	B Term	C Marks			
1	BHMS I Syllabus	-	Refer to table 8.5 below	05	03	01
2	Different approaches for studying Homoeopathic Materia Medica	I		0	01	0
3	Integrating the knowledge of Pathology and Toxicology in better understanding of Homoeopathic Materia Medica	I		0	0	0
4	Homoeopathic Medicines of II BHMS (48)	I&II		05	04	04

### 8.5 Theme-wise distribution:

Theme	Topics	Term	Marks	MCQ's	SAQ's	LAQ's
A-D	BHMS I Syllabus	-	30	5	3	1
E	Different approaches for studying Homoeopathic Materia Medica	I	5	0	1	0
F	Homoeopathic Medicines of II BHMS (48)	I&II	65	5	4	4

### 8.6 Question paper blueprint

A Question Serial Number	B Type of Question	Question Paper Format (Refer table 8.5 for themes)
Q1	Multiple Choice Questions(MCQ)  10 Questions  1 mark each  All compulsory  Must know part: 7 MCQ  Desirable to know: 2 MCQ.  Nice to know: 1 MCQ	1. Theme A-D 2. Theme A-D 3. Theme A-D 4. Theme A-D 5. Theme A-D 6. Theme F 7. Theme F 8. Theme F 9. Theme F 10. Theme F

Q2	Short answer Questions (SAQ) Eight Questions 5 Marks Each All compulsory Must Know part: 6 SAQ Desirable to Know: 2 SAQ	1. Theme A-D 2. Theme A-D 3. Theme A-D 4. Theme E 5. Theme F 6. Theme F 7. Theme F 8. Theme F
Q3	Long answer Questions (LAQ) Five Questions 10 marks each All compulsory All questions on Must Know No Questions on Nice to Know and Desirable to Know	1. Theme A-D 2. Theme F 3. Theme F 4. Theme F 5. Theme F

## **9. List of recommended text/reference books**

- Allen H.C. (2005). Keynotes Rearranged and Classified with Leading Remedies of the Materia Medica and Bowel Nosodes, (Reprint edition), B.Jain Publishers, New Delhi
- Choudhuri N.M. (2006). A Study On Materia Medica Enriched with real case studies, (Reprint revised edition). B.Jain Publishers, New Delhi.
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- Tyler M.L. (2007). Homoeopathic Drug Picture. (First edition), B Jain Publishers, New Delhi.
- Farrington E.A. (2007) Lectures on Clinical Materia Medica in family order (Fourth edition.) B Jain Publishers Pvt Ltd, New Delhi.
- Farrington E.A. (2005), Comparative Materia Medica. (Reprint edition.) B.Jain Publishers, New Delhi.
- Boericke W, Dewey W, 2016, The Twelve Tissue Remedies by Schussler, Reprint edition, B.Jain Publishers, New Delhi
- All source books.

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**Subject Code:** HomUG-OM-II

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## **1. Preamble**

Organon of Medicine with Homoeopathic Philosophy is a central fulcrum around which education and training of a homoeopathic physician revolves. It lays down the foundations of homoeopathic practice, education, training and research. It not only elaborates on the fundamental laws but also how to apply them in practice. It defines the qualities of a healer, guides the homoeopathic physician in inculcating values and attitude and develop skills.

Nature nurtures us. It is well depicted in our science. Therefore, Homoeopathy is in synchronization with nature. The need to keep life force within us well balanced with nature is well established in the Organon of Medicine by Dr Hahnemann. Dr Hahnemann as an ecologist was well ahead of his time. Philosophically, it connects man and his actions to the dynamic forces available in nature, thus bringing to fore the holistic approach. Lateralization of these concepts helps the student to develop insight into various facets of Life & Living. Homoeopathic philosophy orients the students to homoeopathy as an Art & Science. It's comprehensive understanding needs a core competency in logic and the concepts of generalization and individualization. Its treatment of disease process and relating to the concept of miasm makes it a study of the process of scientific investigation.

The biggest challenge in teaching-learning of homoeopathic philosophy is to first understand the fundamentals according to the Master's writing and then demonstrate them in practice. Quality and real time integration with other subjects helps a student to conceive the holistic perceiving of Man and Materia Medica. The concepts and knowledge required by the Physician with operational knowledge of management of patients and their diseases will need horizontal and vertical integration with Homoeopathic subjects and clinical subjects. First BHMS will need horizontal integration with Anatomy, physiology, pharmacy and HMM. Homoeopathic philosophy will have spiral integration with itself and vertical integration with clinical subjects. Second year will need integration with pathology, community medicine, forensic medicine, along with other homoeopathic subjects. Third and fourth year establishes links with clinical subjects, research methodology and pharmacology.

Science is never static. Since the time of Dr.Hahnemann, medical science has advanced by leaps and bounds. Since Homoeopathy is based on principles rooted in nature, they would stand the test of time. However, their application in the changing times and circumstances would find newer avenues to heal. This is an opportunity for a homoeopath to connect the current advances while relating with the fundamental laws. Mastering all this will make him a master healer and will move him towards higher purpose of existence.



## **2. Course outcomes**

At the end of the BHMS program, a student will be able to-

- i. Understand Mission of a Physician & Higher Purpose of Existence as per the Master's thoughts and words
- ii. Understand Hahnemannian concept of man and integrating it with the concept from the bio-psycho-social perspective.
- iii. Know homoeopathy as a Holistic & Individualistic medical science
- iv. Understand the concept of dynamism and vital force to get insight in health, disease, diathesis and disease.
- v. Relate concepts of Prevention, Promotion & Cure with the Hahnemannian approach
- vi. Know the Healer within the Homoeopathic Physician and work towards bringing forth the qualities of healing.
- vii. Understand Philosophy of Life & Health by applying basic fundamental laws of Homoeopathy.
- viii. Understand homoeopathic philosophy in the context of research

## **3. Learning outcomes**

- i. Understanding the evolution of chronic disease in view of pathogenesis
- ii. Knowing Hahnemannian classification of diseases and its importance
- iii. Correlation of Microbiology and Homeopathy with miasms.
- iv. Correlation of laboratory investigation with the evolution of pathology and miasm
- v. Learning the concept of prevention of disease
- vi. Understanding the concept of causation and relating to homoeopathy
- vii. Classification and analysis of symptoms and correlation with repertory.
- viii. Developing a portrait of disease by integrating the Hahnemannian concept

#### 4. Course content and its term-wise distribution

Sl. No.	Topic
<b>Term I</b>	
1.	Natural Disease vs Artificial Disease (Aphorisms 28-33)*
2.	The Correctness of Homoeopathic Therapeutic Law of Nature (Aphorisms 34-51)*
3.	Classification of Diseases (Hahnemannian Classification of Disease) with Introduction to Miasm (Aphorisms 71-82)*
4.	Case Taking (Aphorisms 83-103)*
5.	Homoeopathic Philosophy:
5.1	Symptomatology: Details regarding Symptomatology are to be comprehended by referring to the relevant aphorisms of Organon of medicine and chapters of the books on homoeopathic philosophy.
5.2	Case taking: The purpose of homoeopathic case-taking is not merely the collection of disease symptoms from the patient but comprehending the patient as a whole, with the correct appreciation of the factors responsible for the genesis and maintenance of illness. Hahnemann's concept and method of case-taking, as stated in Organon is to be stressed. Case receiving-perceiving techniques and symptoms-grading needs to be introduced and discussed. The prerequisite of the physical environment & of the physician also needs to be outlined.
5.3	Case processing: This includes-
5.3.1	Analysis of Symptoms
5.3.2	Evaluation of Symptoms
5.3.3	Totality of symptoms
5.3.4	Susceptibility
<b>Term II</b>	
6.	Record Keeping (Aphorism 104)*
7.	Various Systems of Medicine (Aphorisms 52-70)*
8.	Causation: Thorough comprehension of the evolution of disease, taking into account pre-disposing, fundamental, exciting and maintaining causes.
9.	Individuality- individualization- its process
10.	Anamnesis- evolution of disease
11.	Disease-its progress- complex disease relation with miasm
12.	Introduction to the concept of suppression

## 5. Teaching hours

### 5.1. Gross division of teaching hours

Organon of Medicine and Homoeopathic Philosophy		
Year	Teaching hours- Lectures	Teaching hours- Non-lectures
II BHMS	150	100

### 5.2 Teaching hours theory

Sl. No	List of Topics	Hours
1.	Natural Disease vs Artificial Disease	05
2	The Correctness of Homoeopathic Therapeutic Law of Nature	20
3	Classification of Diseases with introduction to Miasm	20
4	Case Taking (Aphorisms 83-103)	20
5	Symptomatology	07
6	Case taking (Homoeopathic Philosophy)	12
7	Case processing	15
8	Various systems of Medicine	15
9	Record Keeping	02
10	Causation	15

11	Anamnesis-evolution of disease, Disease its progress-complex disease, Individualization-its process, Susceptibility- types and factors modifying it	16
12	Introduction to the concept of suppression	3
	<b>Total</b>	<b>150</b>

### 5.3. Teaching hours Non-lecture

Sr. No	Non-Lecture Activity	Term	Time Allotted per Activity (Hours)
1	Clinical(to be integrated with topics under Pathology, Practice of Medicine, Surgery and ObGy)	I & II	75
2	Demonstrative	I & II	25
2(a)	Seminar / Tutorials		10
2(b)	Problem based learning/ Case Based Learning		10
2(c)	Assignment/ Symposium / Group discussion		5
	<b>Total</b>		<b>100</b>

## 6. Competencies tables

### 6.1 Natural disease vs artificial disease (Aphorism 28-33)

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 1.1	K& S HO	K	<b>Aphorism 28-33</b>  Artificial disease is stronger than Natural disease	Define modus opernadi of homoeopathic cure	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ, Viva	Spiral Pharmacy
HomUG-OM-II 1.2				Define and differentiate between Natural and Artificial Disease						
HomUG-OM-II 1.3				Identify factors differentiating Natural & Artificial Disease						
HomUG-OM-II 1.4				Compare the strength of Natural Disease vis-à-vis Artificial Disease						
HomUG-OM-II 1.5				Justify the superiority of Artificial Disease						

## 6.2 The correctness of Homeopathic therapeutic law of nature(Aphorisms 34-51)

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 2.1	K & S HO	K	<b>Aphorism 34-35</b> Therapeutic Law of Nature	Describe the factors needed to cure a disease	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ, Viva	
HomUG-OM-II 2.2		K	<b>Aphorism 36-42</b> Discuss what happens when two dissimilar diseases meet in nature	Compare the different scenarios viz. Natural diseases meet, Natural and Artificial Disease meet	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ, Viva	
HomUG-OM-II 2.3		K	<b>Aphorism 43-45</b> Discuss what happens when two Similar diseases meet in nature	Compare the scenarios viz. Natural diseases meet, Natural and Artificial	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ, Viva	

HomUG-OM-II 2.4	K & S HO	K	<b>Aphorism 45-46</b> Examples of Homeopathic Cure	List the examples of cure in nature	Cognitive Recall Level I	Must Know	Lecture Small Group Discussion	SAQ	MCQ, SAQ, Viva	
HomUG-OM-II 2.5		K	<b>Aphorism 47-49</b> Learning from Nature	Discuss the learning from the nature's examples of cure	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	SAQ, LAQ, Viva	
HomUG-OM-II 2.6		K	<b>Aphorism 50</b> Hazardous Homoeopathic Remedy	Discuss the effect of Natural diseases used for treating similar Natural Diseases	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	SAQ, LAQ, Viva	
HomUG-OM-II 2.7		K	<b>Aphorism 51</b> Advantage of Homoeopathic medicines	Discuss artificial morbid agents and their advantage over natural diseases	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	SAQ, LAQ, Viva	<b>Pharmacy (V)</b> <b>Materia Medica (V)</b>

### 6.3 Classification of disease (Hahnemannian classification of disease) with introduction of miasm (Aphorisms 71-82)

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG -OM-II 3.1	K & S HO	K	<b>Aphorism 71</b> Homeopathic System of Medicine	List the points necessary in the operation of curing	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ Viva	<b>Organon (Spiral) Aphorism 3</b>
HomUG -OM-II 3.2				Discuss Hahnemann's classification of disease						
HomUG -OM-II 3.3	K & S HO P C	K H	<b>Aphorism 72</b> General Survey of Diseases	Define Acute disease Define Chronic disease Illustrate with examples	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ Viva	<b>Organon (Spiral)</b> Vital force
HomUG -OM-II 3.4		K	<b>Aphorism 73</b> Acute Diseases	List the types of acute diseases Illustrate with examples of each	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	MCQ SAQ Quiz	MCQ SAQ LAQ Viva	<b>Practice of Medicine (H/V)</b>
HomUG -OM-II 3.5		K	<b>Aphorism 74-76</b> Chronic Diseases	List examples of Chronic diseases Define Iatrogenic Disease with examples Management of Iatrogenic Diseases	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ LAQ Viva	Modern Pharmacology (H)



HomUG -OM-II 3.6		K	<b>Aphorism 77</b> Pseudo-chronic Diseases	Define Inappropriately named chronic diseases List the causes of the same Examples	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ LAQ Viva	
HomUG -OM-II 3.7	K & S HO P C	K	<b>Aphorism 78</b> True Chronic Diseases	Define and discuss true natural Disease	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	SAQ	MCQ SAQ LAQ Viva	
HomUG -OM-II 3.8		K	<b>Aphorism 79</b> Syphilis & Sycosis	Define Miasm Recognise the miasms Identify the primary presentation of miasm	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	SAQ	MCQ SAQ LAQ Viva	<b>Pathology (H)</b>
HomUG -OM-II 3.9		K	<b>Aphorism 80-81</b> Psora	Identify the primary presentation of Psora List the types of presentations of Psora Summarise footnote 77 List the causes that influence transformation of Psora	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	SAQ	MCQ SAQ LAQ Viva	<b>Pathology (H)</b>

HomUG -OM-II 3.10		K	<b>Aphorism 82</b> Managem ent of Chronic Diseases	Discuss the management of Chronic diseases	Cognitive Understand and interpret Level II	Must Know	Caselet Lecture Small Group Discussion	SAQ	SAQ Viva	
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#### 6.4 Case taking (Aphorisms 83-103)

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG -OM-II 4.1	K & S HO P C	K H	<b>Aphorism 83</b> Prerequisites for case taking	List the prerequisites for case taking Discuss techniques to develop and improve on these	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Case simulation	MCQ SAQ Viva	MCQ SAQ Viva	
HomUG -OM-II 4.2	K & S HO P C P B L C S	K K H S H	<b>Aphorism 84-89</b> History taking	Explain the steps of case taking Discuss the dos and don'ts of case taking	Cognitive Understand and interpret Problem solving Level II& III	Must Know	Lecture Case simulation Case discussion OPD/IPD in small groups	MCQ SAQ	MCQ SAQ Viva	
HomUG -OM-II 4.3	K & S HO P B L	K H S H D	<b>Aphorism 90</b> Physician's observation	List the various headings to observe in a patient	Cognitive Understand and	Must Know	Lecture Movies /clips	MCQ SAQ Check-list	MCQ SAQ Viva	<b>Anatomy/ Physiology (Spiral)</b>

				Discuss the importance of these observations Co-relate with Materia Medica and Repertory	interpret Level II Psychomot or Level I & II		Case simulation			<b>Practice of Medicine (Horizontal) Materia Medica (H &amp; S) Repertory (H &amp; S)</b>
HomUG -OM-II 4.4	K & S HO P B L	K K H	<b>Aphorism 91</b> Original Unmodified Picture	Discuss the importance of noting the original form of disease	Cognitive Understand and interpret Level II	Must Know	Lecture Caselet	MCQ SAQ	MCQ SAQ Viva	
HomUG -OM-II 4.5	K & S P C	K	<b>Aphorism 92</b> Case taking in acute disease	Discuss the importance of case taking in acute cases	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Caselet	MCQ SAQ	MCQ SAQ Viva	
HomUG -OM-II 4.6	K & S HO P C P B L C S	K K H	<b>Aphorism 93</b> Obvious cause of the Disease	Discriminate between various causes of sensitive nature Ask relevant questions	Affective Level I	Must Know	Lecture Small Group Discussion Role play	MCQ SAQ	MCQ SAQ Viva	Fundamentals of Psychology (S)
HomUG -OM-II 4.7	K & S HO P C C S	K H	<b>Aphorism 94</b> General cause of the Disease	Plan the case taking to ascertain the maintaining cause if any	Cognitive Decision /Problem Solving Level III	Must Know	Lecture Small Group Discussion Case simulation OPD/IPD	MCQ SAQ	MCQ SAQ Viva	<b>Aphorism 5 Organon (S)</b>

HomUG -OM-II 4.8	K & S HO P C	K H	<b>Aphorism 95</b> Case taking in chronic disease	Design the case taking in chronic disease Evaluate the importance of accessory symptoms	Cognitive Decision /Problem Solving Level III	Must Know	Lecture Small Group Discussion Case simulation OPD/IPD	MCQ SAQ	MCQ SAQ LAQ Viva	
HomUG -OM-II 4.9	K & S HO C S	K	<b>Aphorism 96-97</b> Disposition s of patients in case taking	Differentiate the dispositions of patients while answering Differentiate between Hypochondriac s and Feigners (malingering) Analyse the reasons behind the disposition	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Case simulation OPD/IPD	MCQ SAQ	MCQ SAQ Viva	Fundamentals of Psychology (S)  <b>Symptomatology Organon</b>
HomUG -OM-II 4.10	K & S HO P B L C S	K	<b>Aphorism 98</b> Demands of Case taking	Analyse the answers given by the friends and attendants Compare that with the patient's answer Listen to the patients' answers	Cognitive Understand and interpret Level II  Affective Level I	Must Know	Lecture Small Group Discussion Case simulation OPD/IPD	MCQ SAQ	MCQ SAQ Viva	<b>Psychology (S)</b>
HomUG -OM-II 4.11	K & S HO	K	<b>Aphorism 99</b>	Discuss the advantages of case taking in	Cognitive Understand and	Must Know	Lecture	MCQ SAQ	MCQ SAQ Viva	

			Case taking in acute disease	acute diseases vis-à-vis chronic case	interpret Level II		Small Group Discussion			
HomUG -OM-II 4.12	K & S HO P C Community Health	K	<b>Aphorism 100-103</b> Case taking in epidemic and sporadic disease	Discuss the salient points of case taking in an epidemic or sporadic disease Differentiate between common and characteristic symptom in above cases Discuss the concept of Genus epidemicus	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ SAQ	MCQ SAQ Viva	<b>Organon (S)</b>

### 6.5 Symptomatology

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 5.1	K & S	K	Define Symptoms and their importance	Define Objective and subjective symptoms	Cognitive Understand and interpret Level II	Must Know	Class room lecture , Group discussions	MCQ SAQ	LAQ	Horizontal with Pathology  Vertical with POM, OBG, Surgery
HomUG-OM-II 5.2				Enumerate different types of symptoms						
HomUG-OM-II 5.3		K		Explain symptoms according to Hahnemann's view						
HomUG-OM-II 5.4	K & S	K		Define Totality of symptoms	Cognitive/ Understand & Interpret level II	Must Know	Class room lecture , Group discussions Caselets	MCQ	LAQ VIVA	
HomUG-OM-II 5.5				Explain types of modalities						

HomUG -OM-II 5.6	K & S	K	Define Symptomatology in relevance with Dr. KENT	Understanding the method of forming the TOS for prescribing Identify the nature and value of symptoms	Psychomotor / Problem Solving Level I	Must Know	Caselets  P B L	SAQ	LAQ SAQ	Vertical with Repertory
HomUG -OM-II 5.7				Analysis of the case Explain the grade of symptoms of disease						
HomUG -OM-II 5.8				Explain the grade of symptoms of drug						

### 6.6 Case taking (Homoeopathic Philosophy)

SI No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 6.1	K & S HO P C	K	Roberts Ch 8 Case Taking	Discuss the essentials needed to be recorded in taking the case	Cognitive/ Level III	Must know	Lecture Tutorials	MCQ SAQ	MCQ SAQ LAQ Viva	Record keeping <b>Organon (S)</b>
HomUG-OM-II 6.2				List the dos and don'ts of case taking						
HomUG-OM-II 6.3				Difference between acute and chronic case taking						
HomUG-OM-II 6.4		K	Case taking Views of stalwarts	Explain View of Dr. J T Kent on Case Taking Explain View of Dr. Stuart Close on Case Taking						



### 6.7 Case processing

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 7.1	K & S  P C	K H S H D	Analysis	Define Analysis Identify different groups to analyse the symptoms Justify the analysis	Cognitive Level III	Must Know	Lecture Small Group Discussion Case simulation OPD/IPD	MCQ SAQ Checklist	MCQ SAQ LAQ	
HomUG-OM-II 7.2			Evaluation	Define Evaluation Justify and defend the evaluated symptoms	Cognitive Level III					
HomUG-OM-II 7.3			Investigation	Discuss the investigation Plan the case	Cognitive Level III					<b>Pathology (H)</b>
HomUG-OM-II 7.4			Diagnosis	Examine the case	Cognitive Level III Psychomotor Level I & II					<b>Practice of Medicine(H)</b>
HomUG-OM-II 7.5	K & S	K	Develop Portrait of Disease by integrating Hahnemannian concept	Define Disease portrait ( Kent -Ch- 30), (Roberts- Ch- 9),(Close- Ch- 11, 12)	Cognitive/ Understand & Interpret level II	Must Know	Caselets / Classroom discussion/ DOPS	MCQ SAQ	LAQ	Horizontal with Pathology, Materia Medica, Repertory

### 6.8 Totality of symptoms

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 8	K & S	K	Develop Portrait of Disease by integrating Hahnemannian concept	Define Disease by portrait (Kent -Ch-30), (Roberts-Ch-9), (Close-Ch-11, 12)	Cognitive/ Understand & Interpret level II	Must Know	Caselets / Classroom discussion/ DOPS	MCQ SAQ	LAQ	Horizontal with Pathology, Materia Medica, Repertory

### 6.9 Susceptibility

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 9.1	K & S  HO  P C C B L	K	Susceptibility	Define Susceptibility	Cognitive Level II	Must Know	Lecture	MCQ SAQ		<b>Organon (S)</b>
HomUG-OM-II 9.2				Discuss the factors modifying susceptibility	Cognitive Level II		Small Group Discussion Case based Learning Seminar/ Symposium			
HomUG-OM-II 9.3				Predict the susceptibility of the patient to the drug prescribed	Cognitive Level III					

### 6.10 Record keeping

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 10.1	K & S HO P C D	K H	<b>Aphorism 104</b> Record keeping	Discuss the importance of Record keeping Legality of case record	Cognitive Decision /Problem Solving Level III	Must Know	Lecture OPD/ IPD Case simulation Project work	MCQ SAQ	MCQ SAQ LAQ Viva	<b>FMT (H)</b>
HomUG-OM-II 10.2	K & S	K	Define Record Keeping	Define Record Keeping Explain Case Records	Cognitive / Recall	Desire-able to know	Caselets DOPS	MCQ	SAQ	With Repertory

### 6.11 Various systems of medicine

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 11.1	K & S HO	K	<b>Aphorism 52</b> Chief Methods of Cure	List and Discuss different methods of Cure	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Seminars	MCQ SAQ Quiz	MCQ SAQ, Viva	Spiral Pharmacy
HomUG-OM-II 11.2		K	<b>Aphorism 53</b> Homeopathic Method	Discuss the Fundamental Laws	Cognitive Understand and interpret Level II	MustKnow	Lecture Small Group Discussion Seminars	MCQ SAQ Quiz	MCQ, SAQ, LAQ, Viva	<b>ORGANON (Spiral)</b>

			Application of Law of Cure							
HomUG-OM-II 11.3		K	<b>Aphorism 54</b> Different forms / System of Medicines Allopathic Method	Compare the outcomes of Various theories	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Seminars	MCQ SAQ Quiz	MCQ, SAQ, LAQ, Viva	<b>ORGANON (Spiral)</b>
HomUG-OM-II 11.4	K & S HO	K	<b>Aphorism 55-56</b> Palliation in Allopathy	Discuss the awareness of public to effect of palliative treatment	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Seminars	MCQ, SAQ	MCQ, SAQ, LAQ, Viva	<b>Modern Pharmacology (V) Medicine (V)</b>
HomUG-OM-II 11.5		K	<b>Aphorism 57-58</b> Symptomatic Treatment by Contraria	Explain the symptomatic treatment in contraria	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Seminars	MCQ, SAQ	MCQ, SAQ, LAQ, Viva	<b>Modern Pharmacology (V) Medicine (V)</b>
HomUG-OM-II 11.6		K	<b>Aphorism 59</b> Injurious effects of antipathic Line of Treatment	Analyse the examples of effects of Antipathic line of treatment	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion Seminars	MCQ, SAQ	MCQ, SAQ, LAQ, Viva	<b>Modern Pharmacology (V) Medicine (V)</b>

HomUG-OM-II 11.7	K & S HO	K	<b>Aphorism 60</b> Palliation in Allopathy	Discuss the Hazard of increasing doses in palliative treatment	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ Viva	<b>Modern Pharmacology (V), Medicine (V), Gynaec (H), Surgery(H)</b>
HomUG-OM-II 11.8		K	<b>Aphorism 61</b> Utility of Homoeopathic treatment	Compare the utility of Homoeopathic & Allopathic treatment	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ Viva	<b>Modern Pharmacology (V), Medicine (V), Gynaec (H), Surgery(H)</b>
HomUG-OM-II 11.9	K&S HO P C	K	<b>Aphorism 62-63</b> Reason for injurious nature of the palliative and sole efficacy of homoeopathic medicine	Define Primary and Secondary Action	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, Viva	
HomUG-OM-II 11.10		K H	<b>Aphorism 64</b> Explanation of Primary and Secondary Action	Differentiate between Primary and Secondary Action	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, Viva	
HomUG-OM-II 11.11		K	<b>Aphorism 65</b> Examples of Primary and	Illustrate with examples of Primary and	Cognitive Understand and	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, LAQ Viva	<b>Modern Pharmacology (V) Medicine (V)</b>

			Secondary Action	Secondary Actions	interpret Level II					
HomUG-OM-II 11.12	K & S HO	K	<b>Aphorism 66</b> Secondary Curative Action	Analyse the effect of smallest homoeopathic doses in secondary action	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, LAQ	
HomUG-OM-II 11.13		K	<b>Aphorism 67</b> Define and explain Suspended Animation	Discuss the use of antipathic line of treatment in specific cases	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, LAQ	
HomUG-OM-II 11.14		KH	<b>Aphorism 68</b> Analyse the efficacy of Minuteness of Homeopathic medicines in cure	Application of Law of Minimum	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, LAQ	<b>Organon (S)</b>
HomUG-OM-II 11.15	K & S HO	K	<b>Aphorism 69</b> Hurtfulness of Antipathic Treatment	Evaluate the effect of Antipathic line of treatment	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, LAQ	<b>Modern Pharmacology (H) Medicine (V)</b>
HomUG-OM-II 11.16	K & S HO	K	<b>Aphorism 70</b> Summary of Homeopathic system of Medicine	List the inferences derived from the Aphorisms 1-70	Cognitive Understand and interpret Level II	Must Know	Lecture Small Group Discussion	MCQ, SAQ	MCQ, SAQ, LAQ	

### 6.10 Causation

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 12.1	K & S	K	Etiology Concept of Disease	Recall the various concept of disease	Cognitive Level II Understand and Interpret	Must know	Lectures Small group Discussion	MCQ SAQ	MCQ SAQ LAQ Viva	<b>Organon (S)</b>
HomUG-OM-II 12.2	K & S		Biological Concept of disease	Discuss the biological concept of disease		Desirable to know				<b>Pathology (H)</b>
HomUG-OM-II 12.3	C S		Environmental and Constitutional Factors	Discuss the concept of stress/ strain / Conflict		Must know				<b>Psychology (S)</b> Personality Adaptation
HomUG-OM-II 12.4	P C		Importance of diagnosis in Homeopathy	List the importance of diagnosis in daily practice		Must know				<b>Practice of Medicine (H &amp; V)</b>
HomUG-OM-II 12.5			Concept of causation & relating it with homoeopathy	Define fundamental(miasm), exciting & maintaining cause	Cognitive Level II Understand and Interpret	Must know	Lectures Small group Discussion	MCQ SAQ	MCQ SAQ LAQ Viva	Horizontal with Pathology, Materia Medica, Repertory
HomUG-OM-II 12.6	K & S and Scholarship	K	Classification of Disease	Classification of disease as per Hahnemann and other stalwarts like Sarkar	Cognitive/ Understand & Interpret level II	Must Know	Classroom discussion Case Based Learning	MCQ SAQ	LAQ	

### 6.11 Introduction to the evolutionary concept of miasm

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integrati on
								F	S	
HomUG-OM-II 13.1	K & S	K	Discovery of Miasm Definition of Miasm Primary basic features of Miasm	Relate to Hahnemann's journey to discover the concept of miasm in chronic diseases	Cognitiv e Level II Understa nd and Interpret	Desirabl e to know	Lecture Small group discussion	MCQSA Q	MCQ SAQ LAQ Viva	<b>Organon (S)</b>
HomUG-OM-II 13.2	K & S	K	Hahnemann classification of disease	Define Hahnemann's concept of miasm	Cognitive / Understand & Interpret Level II	Must Know	Class room lecture / Small group Discussions / Caselets	MCQ SAQ	LAQ	Horizontal with Pathology
HomUG-OM-II 13.3				Explain pathological consideration and general survey of disease Hahnemann's theory of Chronic Disease & bacteriology Acute miasm						
HomUG-OM-II 13.4	K & S	K	Miasm	Explain characteristic of Psora	Cognitive / Understand & Interpret level II	Desirable to know	Classroom discussion/ group discussions	MCQ SAQ	LAQ	
HomUG-OM-II 13.5				Explain characteristic of Sycosis						



HomUG-OM-II 13.6				Explain characteristic of Syphilis Foot note: 74, 76, 77, 78, 79, 80						
HomUG-OM-II 13.7	K & S	K	Understanding chronic disease in view of pathogenesis	Co- relate laboratory investigation with evolution of pathology and miasm	Cognitive / Understand & Interpret level II	Desirable to know	Caselets / Classroom discussion/	MCQ SAQ	LAQ	Horizontal with Pathology
HomUG-OM-II 13.8				Co- microbiology & homoeopathy with miasm						
HomUG-OM-II 13.9	K & S	K	Miasm & Pathology	Correlation of homoeopathy to pathology with reference to Dr. Kent, Close, Roberts	Cognitive / Understand & Interpret level II	Nice to know	Classroom discussion/	MCQ SAQ	LAQ	

### 6.12 Individuality

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 14.1	K & S	K	Life, Health & Disease	Define Individuality	Cognitive Level II Understand and Interpret	Must know	Lecture	MCQ SAQ	MCQ SAQ LAQ Viva	<b>Pathology Practice of Medicine Materia Medica</b>
HomUG-OM-II 14.2				Describe factors contributing to individualise a patient			Small Group Discussion			
HomUG-OM-II 14.3				Discuss with examples			Case based Learning Seminar			

### 6.13 Anamnesis- evolution of disease

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 15.1	K & S	K	History of Disease and its evolution	Define Anamnesis	Cognitive Level II Understand and Interpret	Must know	Lecture	MCQ SAQ	MCQ SAQ LAQ Viva	<b>Pathology Practice of Medicine Materia Medica</b>
HomUG-OM-II 15.2				Define evolution of disease process and prognosis of disease			Small Group Discussion Case based Learning Seminar			

#### 6.14 Disease-its progress- complex disease relation with miasm

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 16.1	K & S	K	Progression of disease	Define Complex disease	Cognitive Level II Understand and Interpret	Must know	Lecture	SAQ	MCQ, SAQ, LAQ, VIVA	<b>Organon</b>
HomUG-OM-II 16.2				Discuss progression of disease in relation with –			Small Group Discussion			
				Psora (Functional Changes) - Sycosis (Infiltration) - Syphilis (Destruction)			Case based Learning  Seminar			

### 6.15 Introduction to the concept of suppression

Sl. No	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-OM-II 17.1	K & S  HO P C	K	Suppression Causes Effects and Management	Define Suppression	Cognitive Level II Understand and Interpret	Nice to Know	Lecture Caselet	MCQ SAQ	SAQ	Pathology (H)
HomUG-OM-II 17.2				Enumerate the types and causes of Suppression			Case based Lerarning			
HomUG-OM-II 17.3				Discuss the effects of Suppression						
HomUG-OM-II 17.4				Explain the management						

## 7. Teaching learning methods

Lectures (Theory)	Non-lectures (Practical)
Lectures	Clinical demonstration
Small group discussion	Problem based group discussion
Integrated lectures	Case based learning
Assignments	Tutorials
Library reference	Seminars
	Symposium
	Assignments
	Self-learning

There have to be classroom lectures, small group discussions, case discussions where case-based learning (CBL) and problem-based learning (PBL) are especially helpful.

Audiovisual (AV) methods for classroom teaching may be an innovative aid in order to demonstrate the related graphics and animations etc.

In the case of clinical demonstration – DOAP (Demonstration – Observation – Assistance – Performance) is very well applicable.

## 8. Details of assessment

### 8.1 Overall Scheme of Assessment (Summative)

Sr. No	Professional Course	Term I (1-6 Months)		Term II (7-12 Months)		
1	Second Professional BHMS	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	FUE (end of 12 months)	
		10 Marks Viva	50 Marks Practical/ Viva i) Viva voce -25 marks	10 Marks Viva	100 marks theory	100 marks (Clinical/practical+ Viva+ IA)

			ii) Clinical performance – 25 marks Case taking and analysis and evaluation			
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## 8.2 Number of papers and marks distribution for Final University Examination (FUE)

Sr. No.	Course Code	Papers	Theory	Practical/ Clinical	Viva Voce	Internal Assessment**	Grand Total
1	HomUG-OM-II	01	100 marks	50 marks  i) Case taking- 10 marks ii) Case processing-25 marks iii) Case presentation- 5 marks iv) Journal*-10 marks	40 marks	10 marks  (Marks of PA I + TT I + PA II)	200marks

\*Journal with 10 cases needs to be maintained by the students which should include Case Taking, Case Processing -Analysis & Evaluation, Investigations, Probable Diagnosis, Classification of disease in that case, Susceptibility

**\*\*Method of Calculation of Internal Assessment Marks for Final University Examination:**

**Marks of IA-** (Marks of PA-1 + Marks of TT + Marks of PA-2) / 70 X 10

### 8.3 Paper Layout

**Summative assessment (FUE):**

**Theory- 100 marks**

<b>MCQ</b>	<b>10 marks</b>
<b>SAQ</b>	<b>40 marks</b>
<b>LAQ</b>	<b>50 marks</b>

### 8.4 Distribution of questions for theory exam

<b>Sr. No</b>	<b>Paper</b>			<b>D</b>		
				<b>Type of Questions</b>		
	<b>A</b>	<b>B</b>	<b>C</b>	<b>MCQ</b>	<b>SAQ</b>	<b>LAQ</b>
	<b>List of Topics</b>	<b>Term</b>	<b>Marks</b>	<b>(1 Mark)</b>	<b>(5Marks)</b>	<b>(10 Marks)</b>
1	Aphorism 28- 70 and 83-104	I & II	Refer to table 8.5 below	4	2	2
2	Case taking -receiving-perceiving techniques prerequisites of physician,  Symptomatology, Analysis, Evaluation, Totality of Symptoms	I & II		2	2	1

3	Classification of disease with introduction to miasm ( Aphorism 71-82); Its correlation with pathogenesis and Homoeopathic management	I		2	1	1
4	Anamnesis-evolution of disease, Disease its progress-complex disease, Individualization-its process, Susceptibility: types and factors modifying it	II			2	
5	Causation; Introduction to the concept of suppression	II			1	1

### 8.5 Theme-wise distribution

No	Chapter/ Topic	Term	Theme	Marks	LAQ	SAQ	MCQ
1	Aphorism 28-104	I & II	A	34	20	10	4
2	Case taking -receiving-perceiving techniques prerequisites of physician, Symptomatology, Analysis, Evaluation, Totality of Symptoms	I&II	B	22	10	10	2
3	Classification of Disease with respect to Pathogenesis, miasm and correlation with homeopathic management	I	C	17	10	5	2
4	Anamnesis-evolution of disease, Disease its progress-complex disease, Individualization-its process, Susceptibility: types and factors modifying it	II	D	12		10	2
5	Causation; Introduction to the concept of suppression	II	E	15	10	5	



## 8.6 Question paper blueprint

<b>A</b> <b>Question Serial Number</b>	<b>B</b> <b>Type of Question</b>	<b>Question Paper Format</b> <b>(Refer Table 8.5 for themes)</b>
Q.1	Multiple choice Questions (MCQ) 10 Questions 1mark each All compulsory Must know part: 7 Desirable to know :3 Nice to know: Nil	<ol style="list-style-type: none"> <li>1. Theme A</li> <li>2. Theme A</li> <li>3. Theme A</li> <li>4. Theme A</li> <li>5. Theme B</li> <li>6. Theme B</li> <li>7. Theme C</li> <li>8. Theme C</li> <li>9. Theme D</li> <li>10. Theme D</li> </ol>
Q.2.	Short answer Questions (SAQ) 8 Questions 5 marks each All Compulsory Must know part:5 Desirable to Know: 2 Nice to know:1	<ol style="list-style-type: none"> <li>1. Theme A</li> <li>2. Theme A</li> <li>3. Theme B</li> <li>4. Theme B</li> <li>5. Theme C</li> <li>6. Theme D</li> <li>7. Theme D</li> <li>8. Theme E</li> </ol>
Q.3	Long answer Questions (LAQ) 5 Questions 10 marks each All Compulsory Must know part:3 Desirable to Know: 2 Nice to know:Nil	<ol style="list-style-type: none"> <li>1. Theme A</li> <li>2. Theme A</li> <li>3. Theme B</li> <li>4. Theme C</li> <li>5. Theme E</li> </ol>

## **9. List of recommended text/reference books**

- Hahnemann Samuel, Organon of Medicine 6<sup>th</sup> edition translated By W. Boericke
- Hahnemann Samuel, Organon of Medicine 5<sup>th</sup> & 6<sup>th</sup> combined edition translated By R. E. Dudgeon
- Kent J.T. Lectures on Homoeopathic Philosophy
- Roberts H. A. The Principle and Art of Cure By Homoeopathy
- Close Stuart, The Genius of Homoeopathy Lectures and Essay on Homoeopathic Philosophy
- Sarkar B. K., Commentary on Organon
- Das A. K., *A Treatise on Organon of Medicine*
- Schmidt Pierre, *The Art of Case Taking and Interrogation*
- Goel Sumit, *A study on Organon of Medicine and Homoeopathic Philosophy*

## **10. List of Contributors**

- I. Dr. Prabhakar Devadiga, MD (Hom), Professor and HOD Smt. Chandaben Mohanbhai Patel Homeopathic Medical College, Mumbai, Maharashtra 400056
- II. Dr. S. M. Sharma, MD (Hom) Professor, Department of Organon and Principal, Dr. Madan Pratap Khunteta Homeopathic Medical College, Jaipur, Rajasthan
- III. Dr. Neeraj Gupta, MD (Hom) Officiating Principal and HOD Dr. B. R. Sur Homeopathic Medical College Hospital Research Centre, Nankpura, Moti Baug, New Delhi 110021

**Subject Name- Homoeopathic Repertory and Case Taking**

**Subject Code: HomUG-R-II**

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## **1. Preamble**

The repertory is a dictionary or storehouse or an index to the huge mass of symptoms of the Materia Medica. The repertory is organized in a practical form indicating the relative gradation of drugs. Repertories not only contain symptoms of proving but also clinical and pathological symptoms found in the Materia Medica and additions made by authors based on their clinical experience. As no mind can memorize all the symptoms of the Materia Medica with their relative grading, repertories serve as an instrument at the disposal of the physician for sifting through the maze of symptoms of the vast Materia Medica. Case taking is the elementary mode of collecting data from the patient and the principles and techniques of case taking will demand constant updating of knowledge of the disease processes and way of interacting with human beings.

Need of the repertory as a tool arose when the number of remedies went on increasing and it was becoming humanly difficult to remember all the symptoms. A simple solution was to index the symptoms with the name of the drug. Repertories aim at simplifying the work of the physician to find the indicated remedy by eliminating the non-indicated remedies. Repertorisation is not the end but means to arrive to the simillimum and reference to Materia Medica based on sound principles of Philosophy is the final court of appeal.

Each repertory has been compiled on the basis of distinct philosophy, structure and utility. To use these instruments effectively, one must understand thoroughly its conceptual base, construction and utility and limitations. Even though there are a number of repertories, the student at the undergraduate level is expected to learn the philosophy and application of basic core repertories namely Kent, BBCR and BTPB. The subject of Repertory must not be taught in isolation but must be taught in horizontal integration with Anatomy and Physiology in I BHMS, Pathology in II BHMS, Surgery and Gynaecology in III BHMS and Practice of Medicine in IV BHMS and vertically integrated with Materia Medica and Organon and Homoeopathic Philosophy in all the years. Integrated teaching over all the years will help the student to grasp and understand the subjects better and connect repertory to all other subjects.

Similarly, case taking demands virtually integrating all the subjects taught from the I through IV BHMS in the consulting room or at the bedside. The physician can never say that he has learnt all every new patient has a new lesson to teach.

The advent of computerization and resulting software has opened many new avenues to collate and correlate the vast information found in the Materia Medica through the repertories. Continued exploration of these connections will generate new data, new repertories and the new application to existing or new illnesses.

## **2. Course outcomes**

At the end of BHMS course, the learner will be able to:

- i. Explain the need and utility of repertory as a tool to find the similimum and in the study of Materia Medica.
- ii. Describe the philosophical backgrounds, construction, utility and limitation of Kent repertory, BTBP, BBCR, Boericke repertory, other clinical repertories and modern repertories.
- iii. Able to describe the various dimension of case taking and able to demonstrate case taking in moderate and difficult cases.
- iv. Classify the symptoms, evaluate the symptoms according to their importance and construct the totality of symptoms based on different philosophies (Dr Kent, Dr Boenninghausen, Dr Hahnemann, Garth Boericke).
- v. Choose an appropriate approach for the case, construct the Repertorial Totality and select the appropriate rubrics and technique of repertorisation.
- vi. Identify the medium, method, process and technique of repertorization.
- vii. Display empathy with the patient and family during case taking.
- viii. Communicate to the patient and attendants the need for sharing patient related information for a complete homoeopathic case taking.
- ix. Develop ability to apply different case taking skills.
- x. Search for the appropriate rubrics in different repertory.
- xi. Understanding and evolution of modern repertories, computerized repertories, operate and use software-based repertories for repertorization.

### **3. Learning objectives**

At the end of II BHMS, the learner will be able to:

1. Describe the steps of case taking in acute and chronic cases
2. Perform simple case taking in acute and chronic case under guidance
3. Illustrate the structure of Boericke repertory
4. Locate different pathological rubrics from Boericke repertory and Kent's repertory

### **4. Course content and its term-wise distribution(theory)**

#### **4.1 Case Taking (Term I)**

- 4.1.1 Demonstration of Homoeopathic case taking in simple, acute and chronic cases (*refer to the table in **Annex-A** at the end defining category of the cases*)
- 4.1.2 Instructions given in Organon regarding case taking

#### **4.2 Correlation of Repertory with Disease and Pathology (Term II)**

- 4.2.1 Introduction to Boericke's repertory
- 4.2.2 Representation of different pathologies and pathogenesis in Boericke and Kent repertory
- 4.2.3 Understanding holistic concept of disease, constitution, diathesis, susceptibility and temperament

## 5. Teaching hours

### 5.1. Gross division of teaching hours

Homoeopathic Repertory and Case Taking		
Year	Teaching hours- Lectures	Teaching hours- Non-lectures
II BHMS	50	30

### 5.2. Teaching hours theory

S. No.	List of Topics	Hours ( Total 50 hrs)
	<b>Term I</b>	
1.	Demonstration of Homoeopathic case taking in simple acute cases	09
2.	Demonstration of Homoeopathic case taking in simple chronic cases	08
3.	Instruction given in Organon regarding case taking	05
	<b>Total</b>	<b>22</b>
	<b>Term II</b>	
4.	Introduction to Boericke repertory	10
5.	Representation of different pathologies and pathogenesis in Boericke and Kent repertory	06
6.	Understanding holistic concept of disease, constitution, diathesis, susceptibility and temperament	12
	<b>Total</b>	<b>28</b>

### 5.3. Teaching hours Non-lecture

Sr. No	Non-Lecture Activity	Hours
<b>Term I</b>		
1	Clinical	15
2	Demonstrative	
2(a)	Seminar / Tutorials	01
2(b)	Problem based learning/ Case Based Learning	02
2(c)	Assignment/ Symposium / Group discussion	02
<b>Term II</b>		
1	Clinical	05
2	Demonstrative	
2(a)	Seminar / Tutorials	01
2(b)	Problem based learning/ Case Based Learning	01
2(c)	Assignment/ Symposium / Group discussion// Rubric hunting exercises	03
	<b>Total</b>	<b>30</b>



## 6. Content mapping

### 6.1. Topic: - Demonstration of Homoeopathic Case Taking in simple acute cases (importance & its application) and instructions given in Organon regarding case taking

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/ Guilbert	Priority	Teaching- Learning Method/Media	Assessment		Integration
								F	S	
Hom UG-R- II-2.1	K/HO	Knows	Acquiring knowledge, skill and attitude about patient and doctor communication and examination in simple acute disease	Define an acute Disease	Cognitive/ Level -1 Remembers/ Recalls	Must Know	Lecture Small Group Discussion	SAQ Viva- voce	–	Horizontal integration with Organon of Medicine  Spiral Integration in III & IV BHMS
Hom UG-R- II-2.2	K/HO	Knows		Classify diseases as per Hahnemann's Philosophy	Cognitive/ Level -1 Remembers/ Recalls	Desirable to Know	Lecture Small Group Discussion	SAQ Viva- voce	–	
Hom UG-R- II-2.3	K/HO	Knows		State the Aphorisms dealing with Acute Case Taking and classification of acute disease	Cognitive/ Level -1 Remembers/ Recalls	Must know	Lecture Integrated discussion	SAQ Viva- voce	–	
Hom UG-R- II-2.4	K/HO/PC	Knows how		Explain the basic structure of case taking. List the steps of case taking in simple acute cases	Cognitive/ Level -1 Remembers/ Recalls	Must know	Lecture Integrated discussion	SAQ Viva- voce	–	

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/Guilbert	Priority	Teaching-Learning Method/Media	Assessment		Integration
								F	S	
Hom UG-R-II-2.5	K/HO/PC	Shows how		Demonstration of simple acute case taking	Psychomotor Level -1 Interpret/ Decide/ Demonstrate Cognitive/ Level -2 understand/ describe	Desirable	Clinical Class Small Group Discussion (I	SAQ Viva-voce	–	Horizontal integration with Pathology & Practice of Medicine
Hom UG-R-II-2.6	K/HO/PC	Shows how		Observe the skills of clinical examination of simple acute case	Psychomotor Level -1 Interpret/ Decide/ Demonstrate	Desirable	Clinical Class Small Group Discussion	SAQ Viva-voce	–	Spiral Integration in III & IV BHMS

**6.2. Topic: - Demonstration of Homoeopathic Case Taking in simple Chronic cases (importance & its application) and instructions given in Organon regarding Case Taking**

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/Guilbert	Priority	Teaching-Learning Method/Media	Assessment		Integration
								F	S	
Hom UG-R-II-2.7	K/HO	Knows	Acquiring knowledge, skill and attitude about	Define a Chronic Disease as per Hahnemann's Philosophy	Cognitive/ Level -1 Remembers/ Recalls	Must Know	Lecture Small Group Discussion	SAQ Viva-voce	–	Horizontal integration with Organon of Medicine,

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/Guilbert	Priority	Teaching-Learning Method/Media	Assessment		Integration
								F	S	
Hom UG-R-II-2.8	K/HO	Knows	patient and doctor communication and examination in chronic disease	Classify chronic diseases as per Hahnemann's Philosophy	Cognitive/ Level -1 Remembers/ Recalls	Desirable to Know	Lecture Small Group Discussion	SAQ Viva - voce	—	Spiral Integration in III & IV BHMS
Hom UG-R-II-2.9	K/HO	Knows		List the aphorisms dealing with Chronic Case Taking	Cognitive/ Level -1 Remembers/ Recalls	Must know	Lecture Integrated discussion	SAQ Viva - voce	—	
Hom UG-R-II-2.10	K/HO/PC	Knows how		Explain the basic structure of chronic case taking. List the steps of chronic case taking	Cognitive/ Level -1 Remembers/ Recalls	Must know	Lecture Integrated discussion	SAQ Viva - voce	—	
Hom UG-R-II-2.11	K/HO/PC	Shows how		Demonstration of case taking simple chronic cases	Psychomotor Level -1 Interpret/ Decide/ Demonstrate	Desirable	Lecture/ Clinical Class Small Group Discussion Integrated discussion	SAQ Viva - voce	—	Horizontal integration with Organon of Medicine, Pathology & Practice of Medicine
Hom UG-R-II-2.12	K/HO/PC	Shows how		Observe the skills of clinical examination of simple chronic case	Psychomotor Level -1 Interpret/ Decide/ Demonstrate Cognitive/ Level -2 understand/ describe	Desirable	Clinical Class Small Group Discussion	SAQ Viva - voce	—	Spiral Integration in III & IV BHMS

### 6.3. Topic: - Introduction to Boericke's Repertory

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/ Guilbert	Priority	Teaching-Learning Method/Media	Assessment		Integrati on
								F	S	
Hom UG-R-II-3.1	K/HO	Knows	Acquiring knowledge about Boericke's Repertory	Discuss the life history of Oscar Boericke with reference to his contributions to repertory	Cognitive/ Level -1 Remembers/ Recalls	Nice to Know	Lecture	Viva - voce	–	Horizontal integration with Organon of Medicine
Hom UG-R-II-3.2	K/HO	Knows		Outline the Plan of Boericke's Repertory	Cognitive/ Level -1 Remembers/ Recalls	Desirable to Know	Lecture Rubric Hunting	SAQ Viva - voce	–	
Hom UG-R-II-3.3	K/HO	Knows		Describe the Construction of Boericke's Repertory	Cognitive/ Level -1 Remembers/ Recalls	Must know	Lecture Rubric Hunting	SAQ Viva - voce	–	
Hom UG-R-II-3.4	K/HO	Knows		Explain the Importance of knowledge of pathology and clinical medicine for using Boericke's Repertory	Cognitive/ Level -2 Remembers/ Recalls	Desirable to Know	Lecture Rubric Hunting	SAQ Viva - voce	–	Horizontal integration with Organon of Medicine, Pathology, Practice of Medicine Spiral Integration in III & IV BHMS
Hom UG-R-II-3.5	K/HO	Knows how		Mention the Scope, Limitation & adaptability of Boericke's Repertory	Cognitive/ Level -2 Understands	Desirable	Lecture Rubric Hunting	SAQ Viva - voce	–	

#### 6.4. Topic: - Representation of different pathologies and pathogenesis in Boericke and Kent

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/Guilbert	Priority	Teaching-Learning Method/Media	Assessment		Integration
								F	S	
Hom UG-R-II-4.1	K/HO	Knows How	Identifying Representation of different pathologies and pathogenesis in Boericke and Kent Repertory	Identify the rubrics representing different pathologies and pathogenesis in Boericke repertory	Cognitive/ Level -1 Remembers/ Recalls	Desirable to Know	Lecture Rubric Hunting	MCQ Quiz	–	Horizontal integration with Pathology, Practice of Medicine Spiral Integration in III & IV BHMS
Hom UG-R-II-4.2	K/HO	Knows How		Identify the rubrics representing different pathologies and pathogenesis in Kent repertory	Cognitive/ Level -1 Remembers/ Recalls	Desirable to Know	Lecture Rubric Hunting	MCQ Quiz	–	

**6.5. Topic: - Understanding holistic concept of disease, miasm, constitution, diathesis, susceptibility and temperament in Boericke and Kent Repertory**

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/Guilbert	Priority	Teaching-Learning Method/Media	Assessment		Integration
								F	S	
Hom UG-R-II-5.1	K/HO	Knows	Understanding the representation of constitution, diathesis, susceptibility and temperament in Boericke and Kent Repertory	Discuss the holistic concept of Health with relation to the study of repertory	Cognitive/ Level - 1 Understands	Desirable to Know	Lecture	Viva-voce		Horizontal integration with Organon of Medicine, Pathology, Practice of Medicine
Hom UG-R-II-5.2	K/HO	Knows		Discuss the concept of Disease with relation to the study of repertory	Cognitive/ Level - 1 Understands	Desirable to Know	Lecture	Viva-voce		
Hom UG-R-II-5.3	K/HO	Knows		Define Constitution, diathesis, susceptibility & Temperament	Cognitive/ Level - 2 Understands & interpret	Desirable to Know	Lecture	Viva-voce		Spiral Integration in III & IV BHMS

Sl. No.	Domain of Competency	Miller's level	Content	SLO	Bloom/Guilbert	Priority	Teaching-Learning Method/Media	Assessment		Integration
								F	S	
Hom UG-R-II-5.4	K/HO	Knows How		Identify the rubrics representing different constitution, diathesis, susceptibility and temperament in Boericke repertory	Cognitive/ Level - 2 Understands & Interpret	Desirable to Know	Lecture Rubric Hunting	MCQ Quiz	–	
Hom UG-R-II-5.5	K/HO	Knows How		Identify the rubrics representing different constitution, diathesis, susceptibility and temperament in Kent repertory	Cognitive/ Level - 2 Understands & Interpret	Desirable to Know	Lecture Rubric Hunting	MCQ Quiz	–	

## 7. Teaching Learning Methods

Lectures (Theory)	Non-lectures (Practical/Demonstrative)
Lecture	Clinical Class
Small Group Discussion	Rubric hunting exercises
Integrated discussion with subjects of Organon of Medicine, Pathology & Practice of Medicine	Case based learning
	Seminar
	Tutorial
	Group Discussion



## 8. Details of assessment

***Note-*** The assessment in II BHMS shall be done only as Internal Assessment (IA) in terms of Periodical Assessments ( PA) and Term Tests (TT) as detailed below. There shall not be any Final University Examination (FUE) at this level. The marks obtained in IA during II BHMS will be added to the marks of IA in the III BHMS University Examination.

### Overall Scheme of Internal Assessment (IA)\*

Professional Course/ Subject	Term I (1-6 Months)		Term II (7-12 Months)	
	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	TT II (end of 12 months)
II BHMS/ Practice of Medicine	10 Marks Viva- <b>A</b>	50 Marks Clinical/Practical and Viva - <b>E</b>  i) Viva voce -25 marks ii) Clinical/practical- 25 a. Recording of Simple acute case - 20 marks  b. Analyse the case for acute and chronic disease as per Hahnemann's classification of disease - 05 marks	10 Marks Viva- <b>B</b>	50 Marks Clinical/Practical and Viva – <b>F</b> Viva voce -25 marks  i) Clinical/practical- 25 a. Recording of Simple chronic case-15 marks  c. Analyse the case for acute and chronic disease as per Hahnemann's classification of disease - 05 marks  b. Locate the rubrics for pathologies in Boericke & Kent's repertory- 05 marks

**\*Method of Calculation of Internal Assessment Marks in II BHMS for Final University Examination to be held in III BHMS:**

Marks of PA I	Marks of PA II	Periodical Assessment Average PA I+ PA II /2	Marks of TT I	Marks of TT II	Terminal Test Average TT I + TT II / 200 x 20	Final Internal Assessment Marks
<b>A</b>	<b>B</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>D+G/2</b>

**9. List of recommended text/reference books**

- Ahmed Munir R(2016). Fundamentals of repertories: Alchemy of homeopathic methodology.
- Bidwell GI.(1915). How to Use the Repertory.
- Boericke, W. (2003). New manual of homoeopathic materia medica and repertory.
- Hahnemann, S. (2014). Organon of Medicine.
- Kent, J. T. (2008). Lectures on Homeopathic Philosophy.
- Kent, J. T. (2016). Repertory of the homeopathic materia medica.
- Kent, J. T: How to study the Repertory, how to use the Repertory.
- Tiwari SK. (2007). Essentials of Repertorization.

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**Annexure A (in reference of course content sub clause 4.1.1)**

	<b>Simple case</b>	<b>Moderate case</b>	<b>Difficult case</b>
<b>Acute case</b>	A case of acute nature as defined by Hahnemann; which is presenting with complete symptoms of either one location or one system of single malady with no other comorbid conditions. Cases where case processing is easy and constructing totality/ rubric search for reference/ Repertorization is easy.	A case of acute nature as defined by Hahnemann; which is presenting with mixed symptomatology (complete as well incomplete symptoms) of multiple location or of single malady of functional level with other comorbid conditions of functional level. Cases where case processing needs a certain set of knowledge, skill for construction of totality and rubric search/ Repertorization is somewhat more difficult then simple cases.	A case of acute nature as defined by Hahnemann; which is presented with mixed symptomatology of multiple locations with structural changes or a complex disease. Cases where case processing needs a certain set of knowledge, skill for construction of totality and rubric search/ Repertorization is somewhat difficult then moderate cases.
<b>Chronic case</b>	A case of chronic nature as defined by Hahnemann; which is having complete symptoms of either one location or one system of single malady with no other comorbid conditions. Cases where case processing is easy and constructing Repertorial totality/ rubric search/ Repertorization is easy.	A case of chronic nature as defined by Hahnemann; which is presenting with mixed symptomatology (complete as well incomplete symptoms) of multiple locations or of single malady of functional level with other comorbid conditions of functional level. Cases where case processing needs a certain set of knowledge, skill for construction of totality and rubric search/ Repertorization is somewhat difficult then simple cases.	A case of chronic nature as defined by Hahnemann; with mixed symptomatology of multiple locations with structural changes or a complex disease. Cases where case processing needs a certain set of knowledge, skill for construction of totality and rubric search/ Repertorization is somewhat difficult then moderate cases

**Subject name:** - Forensic Medicine and Toxicology

**Subject code:** HomUG-FMT

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## **1. Preamble**

Forensic Medicine and Toxicology encompass a multifaceted understanding of the medical, legal, and medico-legal obligations incumbent upon physicians, alongside a profound comprehension of medical ethics, decorum, and the toxicological ramifications of poisons. This field intersects with the elucidation of symptoms associated with homeopathic remedies. It is imperative for every registered Homoeopathic medical practitioner, whether practicing privately or within governmental institutions, to undertake medico-legal examinations as mandated by statute. In the current landscape characterized by burgeoning consumerism in medical services, familiarity with laws pertinent to medical practice, doctrines of medical negligence, and ethical codes assumes paramount importance. Practitioners must be cognizant of their medico-legal responsibilities, adept at making astute observations, drawing logical inferences, and arriving at significant conclusions during investigations into criminal matters and associated medico-legal intricacies.

Furthermore, proficiency in identifying, diagnosing, and studying the management protocols of both acute and chronic poisonings is indispensable. Decisions regarding treatment and referral should be judiciously made, considering the prevailing circumstances and severity of the condition, thereby ensuring timely intervention. Moreover, an understanding of the medico-legal dimensions of poison-related incidents is crucial.

Additionally, recognizing that the toxicological manifestations of poisons may bear resemblance to either the proving or clinical symptoms of certain Homoeopathic remedies underscoring the importance of integration between these disciplines. Such integration not only sheds light on the evolving drug profiles but also enhances comprehension of toxicological and therapeutic principles.

## **2. Course outcomes**

At the end of BHMS II course in Forensic Medicine and Toxicology, the student shall -

- i. Identify, examine and prepare reports / certificates in medico-legal cases/situations in accordance with the law of land.
- ii. Demonstrate awareness of legal/court procedures applicable to medico legal/medical practice
- iii. Acquire knowledge in Forensic medicine and recognize its scope and limitations in Homoeopathic practice
- iv. Be conversant with the code of ethics, etiquette, duties and rights of medical practitioners' profession towards patients, profession, society, state and humanity at large; infamous conduct, medical negligence, and punishment on violation of the code of ethics.
- v. Be able to identify poisons/poisoning, and management of poisoning within the scope of homoeopathy.

- vi. Develop knowledge of Materia Medica by application of knowledge gained by the study of Toxicology
- vii. Develop skills in medical documentation
- viii. Be aware of the principles of environmental, occupational and preventive aspects of general Toxicology

### 3. Course content and its term-wise distribution

Sl. No.	List of Topics	Term
	<b>Forensic Medicine</b>	
1.	Introduction to Forensic Medicine	I
2.	Medical ethics	I
3.	Legal procedures	I
4.	Personal Identification	I
5.	Death and its medico-legal importance	I
	<b>Toxicology</b>	
1.	General Toxicology	I
2.	Clinical toxicology	I
3.	Injury and its medico-legal importance	II
4.	Forensic psychiatry	II
5.	Post-mortem examination (ML autopsy)	II
6.	Impotence and sterility	II
7.	Virginity, defloration; pregnancy and delivery.(Integration with OBG)	II
8.	Abortion and infanticide (Integration with OBG)	II
9.	Sexual Offences	II
10.	Clinical Toxicology	II
	<b>Legislation relating to medical profession (relevant areas)</b>	
1.	Legislation relating to medical profession	II

#### 4. Teaching hours

##### 4.1 Gross division of teaching hours

Forensic Medicine and Toxicology		
Year	Teaching hours- Lectures	Teaching hours- Non-lectures
II BHMS	120	50

##### 4.2 Teaching hours theory

S. no.	List of Topics	Hours
1	Introduction to Forensic Medicine	02
2	Medical Ethics	03
3	Legal Procedures	04
4	Personal Identification	07
5	Death and its medicolegal importance	13
6	General Toxicology	07
7	Clinical Toxicology: Part-I	20
8	Injury and its medicolegal importance	10
9	Forensic Psychiatry	04
10	Postmortem Examination (ML Autopsy)	04
11	Impotence and Sterility	03

12	Virginity, Defloration, Pregnancy and Delivery (Integration with OBG)	03
13	Abortion and Infanticide (Integration with OBG)	04
14	Sexual Offences	06
15	Clinical Toxicology: Part-II	25
16	Legislation relating to Homoeopathic Medical Profession	05
	<b>Total</b>	<b>120</b>

#### 4.3 Teaching hours: Non-lecture

Sr. No	Non-Lecture Activity	Term	Time Allotted per Activity (Hours)
1	<b>Practical</b>	I & II	<b>35</b>
1(a)	<b>Demonstration</b> a) Weapons b) Toxicology - corrosives, irritants, systemic and miscellaneous poisons, gastric lavage c) Charts, diagrams, photographs, models, bones, x-ray films of medico-legal importance		10
1(b)	<b>Certificate Writing</b> a) Various certificates like sickness certificate, physical fitness certificate, death certificate, consent form, birth certificate.		3



	b) Knowledge of injury certificate, examination of rape victim and assailant, drunkenness, post-mortem examination report, age certification		
1(c)	<b>Consent-</b> Medical consent, implied consent, patient confidentiality, autonomy, role of care giver, audio-video recording of cases, safety and custody of medical records		2
1(d)	Demonstration of at least ten medico-legal autopsies.		20
2	<b>Demonstrative</b>	I & II	<b>15</b>
2(a)	Court Procedures (Moot Court)		05
2(b)	Field Visits		10
	<b>Total</b>		<b>50</b>

## 5 Content mapping (competencies tables)

### 5.1. Topic: Introduction to Forensic Medicine-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-1.1	KS CS PBL PRF	K	Definition of forensic medicine, medical	1. Define forensic medicine	C-I	MK	Interactive lecture	MCQ, Viva Voce	Viva voce	None
Hom UG-FMT-1.2		K	jurisprudence, History of Forensic medicine in India.	2. Define Medical Jurisprudence.	C-I	MK	Interactive lecture	MCQ, Viva Voce	Viva voce	
Hom UG-FMT-1.3		K		2. Describe the history of Forensic medicine in India.	C-I	DK	Interactive lecture	SAQ, Assignment	Theory - SAQ, Viva voce	

## 5.2. Topic: Medical ethics-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-2.1	KS PC HO CS PBL PRF	K	Medical Ethics and etiquette – Code of ethics, Infamous conduct, medical negligence, professional secrecy, privileged communication, Rights and duties of doctors and patients etc	Define medical ethics	C-I	MK	Interactive lecture, Small Group Discussions , Written Case Scenario, Moot court.	MCQ, Assignment	Viva voce	None
Hom UG-FMT-2.2			National Commission for Homoeopathy and	Discuss professional misconduct with 2 examples.	C-II	MK	Interactive lectures, Written Case Scenario, Moot court.	SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 2.3			State Homoeopat hic Medical Councils Structure, functions and legislation Homoeopat hic Practitioner s (Profession al Conduct, Etiquette and Code of Ethics) Regulations ,1982 with amendment s (up to 2014) Duties of Registered Homoeopat hic Medical practitioner	Discuss medical negligence with 2 examples.	C-II	MK	Interactive lectures, Written Case Scenario, Moot court.	SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 2.4				Discuss privileged communica tion in relation to rights and duties of doctors and patients.	C-II	MK	Interactive lectures, Written Case Scenario, Moot court.	SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 2.5			in medico- legal cases. Consent, types of consent and its importanc e in practice Bioethics -	Explain the duties of registered Homoeopat hic medical practitioner in medicolega l cases.	C-II	MK	Interactive Lectures,	LAQ	Theory - LAQ , Viva voce Examination	
Hom UG- FMT- 2.6			Introducti on and principles	Discuss the principles of bioethics.	C-II	DK	Interactive lectures, Problem Based Learning.	Assignme nt	Viva voce Examination	

Hom UG- FMT- 2.7				Explain about the types of consent and its importance in practice	C-II	MK	Interactive lectures	SAQ, LAQ	Theory - SAQ and LAQ Viva voce examination	
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### 5.3. Topic: Legal procedures-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- FMT- 3.1	KS CS PBL PRF	K	Understandin g legal terms – CrPC, IPC, IEA, offence, civil and criminal cases  Inquest, types of inquest  Courts of law in India, jurisdiction, hierarchy and	Define CrPC, IPC	C-I	MK	Interactive lecture	MCQ	Theory - Viva voce	None
Hom UG- FMT- 3.2				Differentiate between civil and criminal cases	C-II	MK	Interactive lecture	SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 3.3				Define Inquest	C-I	MK	Interactive lecture	MCQ	Theory - Viva voce	

Hom UG- FMT 3.4			power of different courts of law the sentences passed by them (India)	Explain the different types of Inquest.	C-II	MK	Interactive lecture	SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 3.5			legal procedure Medical evidences in courts, dying declaration, dying deposition, including medical certificates and medico- legal reports.	Classify the different courts of Law in India	C-II	MK	Lecture , Field visits.	MCQ, SAQ LAQ	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 3.6			Recording of evidence Witnesses and types Conduct and duties of doctors in witness box	Explain the power of different courts of law in India.	C-II	MK	Lecture , Field visits.	SAQ LAQ	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 3.7				Differentiate between dying declaration and dying disposition	C-II	MK	Interactive lecture	SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 3.8				Explain the types of witnesses	C-II	MK	Interactive lecture	MCQ, SAQ	Theory - MCQ, SAQ, Viva voce	
Hom UG- FMT- 3.6				Explain the duties of doctors in witness box	C-II	MK	Interactive lecture, Moot court, Field visit	SAQ LAQ	Theory - SAQ and LAQ , Viva voce	



**5.4. Topic: Personal identification-**

Sl. No.	Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-4.1	KS CS PBL PRF.	K	Determinati on of age, gender, race, religion in the living and the dead, Dactylogra phy, foot prints. Bones, scars and teeth, tattoo marks, handwriting , anthropome	Explain the procedure for Identification of age, sex, race and religion in living and dead.	C-II	MK	Interactive lecture, , written case scenario.	SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	None
Hom UG-FMT-4.2				Define Dactylography	C-I	MK	Interactive lecture,	Tutorial Assignme nt	Viva voce	

Hom UG- FMT- 4.3			try and other identificatio n data Examinatio n of biological stains and hair. DNA finger printing Medicolega l importance	Explain the medicolegal importance of dactylography.	C-II	MK	Interactive lecture, written case scenario. Demonstrati on	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 4.4				Discuss the methods of identification of data, with specific reference to anthropometry.	C-II	MK	Interactive lecture, written case scenario. Problem Based Learning, Demonstrati on	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 4.5				Explain the medicolegal importance of DNA fingerprinting	C-II	MK	Interactive lecture, Demonstrati on	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	

**5.5. Topic: death and its medicolegal importance-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-5.1	KS PRF CS	K	Thanatology, Death and its types, their medico-legal importance	Define Thanatology	C-I	MK	Interactive lecture, lecture	MCQ, Tutorial Assignment	Viva voce	None
Hom UG-FMT-5.2			somatic death, molecular death, asphyxia, coma, syncope,	Differentiate between various types of death.	C-II	MK	Interactive lecture, lecture demonstration, written case scenario. Field visits.	MCQ, SAQ, LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 5.3			suspended animation Differentiat e cause, manner and mode of death Pathology of asphyxial death, negative autopsy,	Explain the mechanism of drowning with its signs and symptoms and medicolegal importance.	C-II	MK	Interactive lecture, written case scenario, Problem Based Learning	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 5.4			sudden death and causes Organ transplantat ion and the laws governing organ transplantat ion Signs of death (1)	Explain the mechanism of hanging with its signs and symptoms and medicolegal importance.	C-II	MK	Interactive lecture, written case scenario, Problem Based Learning	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 5.5			immediate, (2) early, (3) late and their medico- legal importance, estimation of post- mortem interval Asphyxial deaths	Explain the mechanism of coma.	C-II	MK	Interactive lecture, written case scenario, Problem Based Learning	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 5.6			(mechanica l asphyxia and drowning). Death from starvation, cold and heat etc.	Explain suspended animation	C-II	MK	Interactive lecture, written case scenario, Problem Based Learning	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 5.7				Discuss medicolegal aspects of Organ Transplantation and laws governing it	C-II	DK	Interactive lecture, written case scenario, Problem Based Learning	MCQ, SAQ LAQ, Tutorial Assignme nt	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 5.8				Explain the immediate, early and late signs of death and their medicolegal importance	C-II	MK	Interactive lecture, written case scenario, Problem Based Learning	MCQ, SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	
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**5.6. Topic: Injury and its medicolegal importance-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- FMT- 6.1	KS CS PBL PRF	K	Mechanical, thermal, firearm, regional, transportation and traffic injuries;	Differentiate between various types of injuries.	C-II	MK	Interactive lecture, lecture demonstration, written case scenario. Field visits.	MCQ, SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	None

Hom UG- FMT- 6.2			injuries from radiation, blast, electrocution and lightning and their medicolegal importance	Explain the types of mechanical injuries with medico-legal importance	C-II	MK	Interactive lecture, lecture demonstration, written case scenario. Field visits.	MCQ, SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 6.3				Explain the types of thermal injuries with medico-legal importance	C-II	MK	Interactive lecture, lecture demonstration, written case scenario. Field visits.	MCQ, SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 6.4				Explain the types of firearm injuries with medico- legal importance	C-II	MK	Interactive lecture, lecture demonstration, written case scenario. Field visits.	MCQ, SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 6.5				Explain the types of regional injuries with medico-legal importance	C-II	MK	Interactive lecture, lecture demonstration, written case scenario. Field visits.	MCQ, SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 6.6				Explain injuries from radiation, blast, electrocution and lightning with medico-legal importance	C-II	DK	Interactive lecture, lecture demonstration, written case scenario. Field visits.	MCQ, SAQ LAQ, Tutorial Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 6.7				Define Ballistics	C-I	MK	Interactive lecture	MCQ, SAQ	Theory - MCQ, Viva voce	



**5.7. Topic: Forensic psychiatry-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-7.1	KS CS PBL PRF	K	Definitions, delusion, delirium, illusion, hallucination, impulse, obsession, mania, ICD-11 classification	Explain delusion.	C-II	MK	Interactive lecture, lecture demonstration. Field visits.	SAQ	Theory – SAQ, Viva-voce	None
Hom UG-FMT-7.2			n of Insanity, mental subnormality. Definition and brief overview of common	Explain delirium.	C-II	MK	Interactive lecture	SAQ	Theory – SAQ, Viva-voce	

Hom UG- FMT- 7.3			mental illnesses. True and feigned mental illness. Civil and criminal responsibilities of a person with mental illness/disability. Development of insanity, diagnosis, admission to mental asylum, care of mentally ill person and discharge.	Explain Illusion.	C-II	MK	Interactive lecture	SAQ	Theory – SAQ, Viva-voce	
Hom UG- FMT- 7.4				Explain hallucination.	C-II	MK	Interactive lecture	SAQ	Theory – SAQ, Viva-voce	
Hom UG- FMT- 7.5				Explain Impulsive obsession disorder.	C-II	MK	Interactive lecture	SAQ	Theory – SAQ, Viva-voce	
Hom UG- FMT- 7.6				Explain mania.	C-II	MK	Interactive lecture	SAQ	Theory – SAQ, Viva-voce	
Hom UG- FMT- 7.7				Explain about the ICD-11 classification of Insanity, mental subnormality	C-II	MK	Interactive lecture	MCQ, SAQ LAQ, Assignment	Theory And Practical Examination	

Hom UG- FMT- 7.8				Discuss civil and criminal responsibilities of person with mental illness.	C-II	MK		MCQ, SAQ LAQ, Assignme nt	Theory And Practical Examination	
Hom UG- FMT- 7.9				Explain Mental Health Act.	C-II	MK		MCQ, SAQ LAQ, Assignme nt	Theory And Practical Examination	
Hom UG- FMT- 7.10				Discuss about the admission of an insane person to mental asylum, care of mentally ill person and discharge.	C-II	MK		MCQ, SAQ LAQ, Assignmen t	Theory And Practical Examination	

**5.8. Topic: Postmortem examination (ML autopsy)-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-8.1	KS CS PBL PRF.	K	Purpose, procedure, legal bindings; difference between pathological and medico-legal autopsies. External examination, internal examination of adult, foetus and skeletal remains. Artefacts	Define autopsy	C-I	MK	Interactive lecture	MCQ,	Viva voce examination	None
Hom UG-FMT-8.2				Enlist the objectives of conducting a Medico legal Autopsy	C-II	MK	Interactive lecture, lecture demonstration, Field visits.	SAQ LAQ, Assignment	Theory – SAQ, LAQ And Viva voce Examination	

Hom UG- FMT- 8.3			Forensic science Laboratory	Define Artefacts	C-I	MK	Interactive lecture	MCQ, SAQ	Theory And Practical Examination	
Hom UG- FMT- 8.4				Discuss in detail about the Forensic science Laboratory	C-II	DK	Interactive lecture, lecture demonstrati on,Field visits.	Assignme nt	Theory-SAQ And Viva voce Examination	

### 5.9. Topic: Impotency and sterility-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- FMT- 9.1	KS CS PBL PRF.	K	Impotence, sterility, sterilization , Artificial	Define Impotence and Sterility	C-I	MK	Interactive lecture,	MCQ, Assignme nt	Theory , Viva voce	Integration with OBG
Hom UG- FMT- 9.2			Inseminatio n, surrogacy, in-vitro fertilization	Explain the factors leading to impotency and sterility	C-II	MK	Integrated learning	SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 9.3			Legal issues related to impotence, sterility and artificial insemination, surrogacy, in-vitro fertilization legitimacy, sperm donation, sperm banks, ova banks, freezing of gametes, frozen embryos, medicolegal importance	Explain Artificial Insemination	C-II	MK	Interactive lecture	SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 9.4				Explain surrogacy with its medico-legal importance	C-II	MK	Interactive lecture	SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 9.5				Explain in- vitro fertilization with its medico-legal importance	C-II	DK	Interactive lecture	SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 9.6				Explain the functions of sperm and ova banks with its medicolegal importance	C-II	NK	Interactive lecture	SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	

**5.10. Topic: Sexual abuse, exploitation in all genders, defloration; pregnancy and delivery-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-10.1	KS CS PBL PRF.	K	The presumptive, probable and positive signs of pregnancy,	Discuss about the presumptive, probable and positive signs of pregnancy	C-II	MK	Interactive lecture, lecture demonstration	MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	Integration with OBG
Hom UG-FMT-10.2			sexual exploitation , sexual abuse,	Explain the medico Legal aspects of legitimacy	C-II	MK	Interactive lecture, lecture demonstration	MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG-FMT-10.3			pregnancy, delivery, posthumous child, pseudocyesis, superfoetation, superfecundation, legitimacy and	Explain superfoetation with its medicolegal importance.	C-II	MK		MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	



			paternity - legal aspects							
Hom UG-FMT-10.4				Explain superfecundation with its medicolegal importance.	C-II	MK		MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	

### 5.11. Topic: Abortion and infanticide-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-11.1	KS CS PBL PRF.	K	Abortion: different methods, complications,	Define abortion.	C-I	MK	Interactive lecture	MCQ, SAQ	Theory - SAQ, Viva voce	Integration with OBG
Hom UG-FMT-11.2			accidents following criminal abortion, MTP, medicolegal importance	Explain different methods of abortion with its signs and symptoms and medicolegal importance	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 11.3			Abortifacient drugs and methods Infant death, signs of live birth, legal definitions,	Explain various signs of live birth	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 11.4			battered baby syndrome, cot death, Munchausen's syndrome	Discuss the regulations of MTP Act 1971	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 11.5				Explain battered baby syndrome	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ Assignment	Theory - SAQ, Viva voce	
Hom UG- FMT- 11.6				Explain cot death.	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ Assignment	Theory - SAQ Viva voce	

Hom UG- FMT- 11.7				Explain Munchausen's syndrome	C-II	MK	Interactive lecture, , group discussion s, Integrated learning	MCQ, SAQ	Theory - SAQ Viva voce	
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### 5.12. Topic: Sexual offences-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- FMT- 12.1	KS CS PBL PRF.	K	Natural sexual offenses, Unnatural sexual offenses, Sexual	Enlist the various sexual offences	C-I	MK	Interactive lecture, small group discussions Integrated learning	Assignme nt	Theory- SAQ Viva voce	Integration w ith OBG
Hom UG- FMT- 12.2			perversions The clinical examination and findings of victim and assailant	Classify the various sexual offences.	C-II	MK	Interactive lecture, small group discussion s, Integrated learning	MCQ, SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 12.3			The medicolega l aspects of sexual offenses and perversions . IPC, CrPC	Explain the natural sexual offences.	C-II	MK	Interactive lecture, small group discussion s, Integrated learning	MCQ, SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 12.4			{ Bhartiya Nyay Sanhita Bill 2023 & Bharatiya Sakshya (Second) Bill 2023 }	Explain the unnatural sexual offences.	C-II	MK	Interactive lecture, small group discussion s, Integrated learning	MCQ, SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 12.5				Explain the different sexual perversions.	C-II	MK	Interactive lecture, small group discussion s, Integrated learning	MCQ, SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 12.6				Discuss the clinical examination and findings of victim and	C-II	MK	Interactive lecture, small group	SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	

				assailant of a sexual offence			discussion s, Integrated learning			
Hom UG-FMT-12.7				Explain the medicolegal aspects of sexual offenses and perversions.	C-II	MK	Interactive lecture, small group discussions, Integrated learning	SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG-FMT-12.8				Explain the provisions in the Bhartiya Nyay Sanhita Bill 2023 & Bharatiya Sakshya (Second) Bill 2023 }	C-II	MK	Interactive lecture, small group discussions, Integrated learning	LAQ, Assignment	Theory - LAQ , Viva voce	

### 5.13. Topic: General toxicology-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-13.1	KS PC HO CS PBL PRF.	K	Forensic Toxicology and Poisons, Classification of poisons Medico – legal	Classify various types of poisons	C-II	MK	Interactive lecture, lecture demonstration, group discussions, Integrated learning	MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	None
Hom UG-FMT-13.2			aspects of poisons, Antidotes and types, Diagnosis of	Explain the general principles of management of poisoning	C-II	MK		SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG-FMT-13.3			poisoning in living and dead, General	Explain the types of antidotes And its uses	C-II	MK		MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG-FMT-13.4			principles of management of poisoning,	Explain the diagnosis of poisoning in living and dead subjects,	C-II	MK		MCQ, SAQ, LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	

			Duties of Homoeopathic Practitioner							
Hom UG-FMT-13.5		K	s in cases of poisoning	Describe the duties of a medical practitioner in the suspected case of poisoning	C-II	DK		MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	

#### 5.14. Topic: General toxicology-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-FMT-14.1	KS PC HO CS PBL PRF.	K	i) Corrosives , ii) Irritants iii) Asphyxiants iv) Neurotics v) cardiac	Describe the action, signs and symptoms, fatal dose, fatal period, post mortem findings and circumstances of corrosive poisoning	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	Integration with Materia medica

Hom UG- FMT- T14.2			vi) Miscellaneous vii) food Poisoning viii) Drug dependence & drug use.	Describe the action, signs and symptoms, fatal dose, fatal period, post mortem findings and circumstances of asphyxiant poisoning.	C-II	MK	Interactive lecture, , group discussion s, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 14.3				Describe the action, signs and symptoms, fatal dose, fatal period, post mortem findings and circumstances of neurotic poisoning.	C-II	MK	Interactive lecture, , group discussion s, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 14.4				Describe the action, signs and symptoms, fatal dose, fatal period, post mortem findings and circumstances of irritant poisoning.	C-II	MK	Interactive lecture, , group discussion s, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	



Hom UG- FMT- 14.5				Describe the action, signs and symptoms, fatal dose, fatal period, post mortem findings and circumstances of cardiac poisoning.	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 14.6				Explain Medicolegal aspects in different poisoning	C-II	DK	Interactive lecture, , group discussions, Integrated learning	SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 14.7				Differentiate between the various presentations of Arsenic and Lead poisoning.	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	
Hom UG- FMT- 14.8				Explain differential diagnosis of Organophosphorus poisoning	C-II	MK	Interactive lecture, , group discussions, Integrated learning	MCQ, SAQ LAQ, Assignment	Theory - SAQ and LAQ , Viva voce	

Hom UG- FMT- 14.9				Explain bioterrorism with the bacterial borne / microbial infections,/ biologic positing	C-II	NK	Interactive lecture, , group discussions ,Integrated learning	SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	
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**5.15. Topic: Legislation relating to medical profession – including latest amendments and superceeding acts as and when applicable-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom /Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- FMT- 15	KS PC HO CS PBL PRF.	K	Various acts as described in term wise contents	Explain the medicolegal aspects of various acts under Forensic Medicine and Toxicology	C-II	MK	Interactive lecture, lecture demonstra tion, Integrated learning	MCQ, SAQ LAQ, Assignme nt	Theory - SAQ and LAQ , Viva voce	None.

### 5.16. Topic: Demonstration of weapons, poisons (Practical)-

Sl. No.	Content	Competency / Outcome	Entry behaviour	Specific Learning Objectives	Learner activity	Assessment
Hom UG-FMT-16.1	a) Weapons b) Toxicology - corrosives, irritants, systemic and miscellaneous poisons, gastric lavage c) Charts, diagrams, photographs, models, bones, x-ray films of medico-legal importance	KS CS PBL PRF	Enumerate different types of weapons. Enumerate different types of injuries caused by weapons	Identify various types of weapons	Demonstration, group discussions, Spotting, PBL	Practical Examination
				Classify injury produced by them		
				Explain medicolegal importance of injuries produced by the weapons.		
Hom UG-FMT-16.2			Enumerate the different names of poisons and methods of poisoning	Identify various types of specimens of poisons		
				Classify the poison as per their action		
				Explain medicolegal importance of poisons		
Hom UG-FMT-16.3			Enumerate different emergency conditions related to GIT where gastric lavage is indicated	Explain gastric lavage procedures ,		
				Explain the merits of Gastric Lavage and its indications and contraindications.		

### 5.17. Topic: Certificate Writing (Practical)-

Sl. No.	Content	Competency / Outcome	Entry behaviour	Specific Learning Objectives	Learner activity	Assessment
Hom UG-FMT-17.1	Various certificates like sickness certificate, physical fitness certificate, death certificate, consent form, birth certificate.	KS CS PBL PRF	Enlist the names of different medical certificates	Write various certificates like sickness certificate, physical fitness certificate, death certificate, consent form, birth certificate.	Certificate writing. Written case scenario.	Practical Examination
Hom UG-FMT-17.2	Knowledge of injury certificate, examination of rape victim and assailant, drunkenness, post-mortem examination report, age certification			Write a report of examination of rape victim, Injury Certificate, Post Mortem Examination report, Age Certification. Drunkenness Certificate.		

### 5.18. Topic: Consent (Practical)-

Sl. No.	Content	Competency / Outcome	Entry behaviour	Specific Learning Objectives	Learner activity	Assessment
Hom UG- FMT- 18	Medical consent, implied consent, patient confidentiality, autonomy, role of care giver, audio-video recording of cases, safety and custody of medical records	KS CS PBL PRF	Explain the meaning of consent.	Write consent in given format.	Written case scenario, Group discussion.	Practical Examination

### 6. Teaching learning methods

Lectures (Theory)	Non-lectures (Practical/Demonstrative)
Lectures	Clinical demonstration
Small group discussion	Problem based discussion
Integrated lectures	Case based learning
Structured interactive sessions	Tutorials
	Seminars
	Video clips
	Assignments
	Field visits (Court visit and Isolation hospitals).
	Self-learning

## 7. Details of assessment

### 7.1 Overall Scheme of Assessment (Summative)

Sr. No	Professional Course	Term I (1-6 Months)		Term II(7-12 Months)		
1	Second Professional BHMS	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	FUE (end of 12 months)	
		10 Marks Viva	50 Marks Practical/ Viva 1. Viva voce -25 marks 2. Practical– 25 marks (Identification of weapons, poisons, X-Rays- 10 Marks, Certificate writing- 10 Marks Case Scenario of consent taking- 5 marks)	10 Marks Viva	100 marks theory	100 marks (Clinical/practical+ Viva+ IA)

**PA: Periodical Assessment; TT: Term Test; FUE: Final University Examinations; IA: Internal Assessment**

## 7.2 Number of papers and Marks Distribution for Final University Examination (FUE)

Sr. No.	Course Code	Papers	Theory	Practical/ Clinical	Viva Voce	Internal Assessment*	Grand Total
1	HomUG-FMT	01	100 marks	50 marks**	40 marks	10 marks (Marks of PA I + TT I + PA II)	200marks

**\*Method of Calculation of Internal Assessment Marks for Final University Examination:**

**Marks of IA-** (Marks of PA-1 + Marks of TT + Marks of PA-2) / 70 X 10

**\*\*Details of practical assessment at FUE**

Sr No	Headings	Marks
1	6 spotters – Bones, weapons, Toxicology specimens, Photographs, models – with their medicolegal aspects - 5 marks Each	30
2	Certificate Writing	10
3	Journal	10
	<b>Total</b>	<b>50</b>

### 7.3 Paper Layout

**Summative assessment(FUE):**

**Theory- 100 marks**

<b>MCQ</b>	<b>10 marks</b>
<b>SAQ</b>	<b>40 marks</b>
<b>LAQ</b>	<b>50 marks</b>

### 7.4 Distribution of questions for theory exam

<b>Sr.No</b>	<b>Paper</b>			<b>D</b> <b>Type of Questions“Yes”can be asked.</b> <b>“No”should not be asked.</b>		
	<b>A</b> <b>List of Topics</b>	<b>B</b> <b>Term</b>	<b>C</b> <b>Marks</b>	<b>MCQ</b> <b>(1 Mark)</b>	<b>SAQ(5</b> <b>Marks)</b>	<b>LAQ</b> <b>(10 Marks)</b>
1	Introduction to Forensic Medicine& Medical Ethics Legal procedure	I	Refer Next Table 7.5	No	Yes	No
2	Personal Identification	I		Yes	Yes	No
3	Death and Its Medicolegal importance	I		Yes	No	Yes
4	Injury and Its medicolegal importance	II		Yes	No	Yes
5	Impotence and sterility	II		Yes	Yes	Yes



	Virginity , defloration pregnancy and Delivery Abortion and infanticide Sexual offences	II				
		II				
		II				
6	General Toxicology	I		Yes	Yes	No
7	Clinical Toxicology- Corrosive Poisons	I		Yes	Yes	No
8	Clinical Toxicology- Irritant Poisons	I		Yes	No	Yes
9	Clinical Toxicology- Asphyxiant poisons	I		No	Yes	No
10	Clinical Toxicology- Neurotics Poisons	II		No	Yes	No
11	Clinical Toxicology- Cardiac Poisons	II		No	Yes	No
12	Clinical Toxicology- Miscellaneous Poisons	II		Yes	No	No
13	Clinical Toxicology- Food Poisoning, Drug Dependence and drug abuse	II		Yes	No	No
14	Legislation relating to medical profession	II		No	No	Yes

### 7.5 Theme-wise distribution of questions:

Theme	Topics	Term	Marks	MCQ's	SAQ's	LAQ's
A	Introduction to Forensic Medicine Medical ethics Legal procedure	I	5	0	5	0
B	Personal Identification	I	6	1	5	0
C	Death and Its Medicolegal importance	I	11	1	0	10
D	Injury and Its medicolegal importance	II	11	1	0	10
E	Impotence and sterility Virginity , defloration pregnancy and Delivery, Abortion, Infanticide Sexual offences	II	16	1	5	10
F	General Toxicology	I	6	1	5	0
G	Clinical Toxicology- Corrosive Poisons	I	6	1	5	0
H	Clinical Toxicology- Irritant Poisons	I	11	1	0	10
I	Clinical Toxicology- Asphyxiant poisons	I	5	0	5	0
J	Clinical Toxicology- Neurotics Poisons	II	5	0	5	0
K	Clinical Toxicology- Cardiac Poisons	II	5	0	5	0
L	Clinical Toxicology- Miscellaneous Poisons	II	2	2	0	0
M	Clinical Toxicology- Food Poisoning, Drug Dependence and drug abuse	II	1	1	0	0
N	Legislation relating to medical profession	II	10	0	0	10

## 7.6 Question paper blueprint

A Question Serial Number	B Type of Question	Question Paper Format (Refer table 7.5 for themes)
Q1	<p>Multiple choice Questions (MCQ)</p> <p>10 Questions</p> <p>1 mark each</p> <p>All compulsory</p> <p>Must know part: 6 MCQ Desirable to know: 2 MCQ. Nice to know: 2 MCQ</p>	<ol style="list-style-type: none"> <li>1. Theme B</li> <li>2. Theme C</li> <li>3. Theme D</li> <li>4. Theme E</li> <li>5. Theme F</li> <li>6. Theme G</li> <li>7. Theme H</li> <li>8. Theme L</li> <li>9. Theme L</li> <li>10. Theme M</li> </ol>

Q2	<p>Short answer Questions(SAQ) 8Questions</p> <p>5 Marks Each , All compulsory Must know part:7 SAQ</p> <p>Desirable to know: 1 SAQ Nice to know: Nil</p>	<ol style="list-style-type: none"> <li>1. Theme A</li> <li>2. Theme B</li> <li>3. Theme E</li> <li>4. Theme F</li> <li>5. Theme G</li> <li>6. Theme I</li> <li>7. Theme J</li> <li>8. Theme K</li> </ol>
Q3	<p>Long answer Questions (LAQ) 5 Questions</p> <p>10 Marks each All compulsory</p>	<ol style="list-style-type: none"> <li>1. Theme C</li> <li>2. Theme D</li> <li>3. Theme E</li> <li>4. Theme H</li> <li>5. Theme N</li> </ol>

## **8. List of recommended Books**

- C. K. Parikh, 2019, *Text Book of Medical Jurisprudence Forensic Medicine & Toxicology* (edition 21<sup>st</sup>) , CBS Publishers
- K.S. Narayan Murty, 2022, *The Essentials of Forensic Medicine & Toxicology*, Jaypee Publication ,
- Modi, N.J , *A Text Book of Medical Jurisprudence and Toxicology*
- Biswas Gautam, 2015, *Review of Forensic Medicine and Toxicology (Including Clinical & Pathological Aspects)*, Jaypee Brothers Medical Publisher (P) Ltd;.
- Nandy Apurba, *Principles of Forensic Medicine Including Toxicology*,
- Sharma D B, 2022, *Essential of Forensic Medicine and Toxicology*, (First edition) , B. Jain Publishers

## **9. List of contributors :**

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**Subject name : Pathology and Microbiology**

**Subject code: HomUG-Path-M**

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## **1. Preamble**

Pathology and Microbiology provide comprehensive knowledge of the pathologic basis of disease, to enable a complete understanding of the reaction of man to different morbid factors causing disease -its natural course, clinical manifestations, complications and sequel.

The students must be able to discriminate symptoms of the patient & disease satisfying the Hahnemannian requirements of physicians as mentioned in aphorism 3 of Organon of Medicine, make them competent in diagnosis and to substantiate miasmatic perspective with pathology for an accurate homoeopathic prescription.

Knowledge also helps in deciding the scope, limitation and prognosis of a case through the understanding of susceptibility. Immune-mediated illnesses are becoming important areas where homoeopathic interventions can play a significant part in alleviating suffering and in bringing about a cure. The teaching should be aligned and integrated vertically in organ systems recognizing deviations from normal structure and function and clinically correlated to provide an overall understanding of the aetiology, mechanisms, laboratory diagnosis and management of diseases and horizontally with Homoeopathic Philosophy, Homoeopathic Materia Medica and Repertory to understand the Homeopathic concept of Disease and its management. Pathology will need alignments with Anatomy and Physiology on one side and clinical subjects on the other side with the foundation of homoeopathic subjects.

## **2. Course outcomes**

At the end of the II BHMS course the students will be able to:

1. Recognize the importance of study of Pathology and Microbiology in Homoeopathic system of medicine
2. Understand the morphological changes in cell structure in disease and recognize the mechanism of the etiological factors in the causation of such changes
3. Integrate the study of Pathology and Microbiology with Homoeopathic philosophy, Materia Medica, and Repertory.
4. Understand classification of diseases as per Master Hahnemann.
5. Understand common and important diseases based on their evolution, aetio-pathogenesis, pathology, progress and prognosis.
6. Develop skill in the identification of pathological features specifically histo-pathological features, and gross pathological specimens.
7. Able to interpret laboratory reports for diagnosis and treatment purpose.
8. Develop a positive attitude towards the role of Pathology and Microbiology in Homoeopathic system

### 3. Course content and its term-wise distribution

#### 3.1 Contents for Term I

Theory	
Sr. No.	Topic
1.	Introduction to Pathology
2.	General Pathology
3.	Introduction to Microbiology
4.	Sterilisation and Disinfection
5.	Culture medias and methods
6.	Infection and Disease
7.	Human Microbiome
8.	Gram positive bacterias
9.	Introduction to Virology
10.	Introduction to Parasitology
11.	Protozoans
Non –lecture- Practical/Demonstrative	
1.	Demonstration of Instruments
2.	Demonstration of Methods of sterilisation



3.	Demonstration of culture medias
4.	Estimation of haemoglobin
5.	Total count of Red Blood Cells
6.	Total count of White Blood Cells
7.	Bleeding time and clotting time
8.	Blood grouping.
9.	Gram staining
10.	Demonstration of histopathological slides
11.	Demonstration of Pathological specimen/models

### 3.2 Contents for Term II

Theory	
Sr. No.	Topic
1.	Systemic Pathology
2.	Gram negative bacterias
3.	Acid fast bacterias
4.	Spirochaetes
5.	Virology-DNA,RNA virus

6.	Parasitology –Helminths
7.	Mycology
8.	Diagnostic procedures in Microbiology
<b>Non –lecture- Practical/Demonstrative</b>	
1.	Staining of thin and thick films.
2.	Differential count.
3.	Erythrocyte sedimentation rate-demonstration
4.	Urine examination-physical,chemical and microscopical examination.
5.	Examination of Faeces- demonstration
6.	Hanging drop preparation.- demonstration
7.	Acid fast staining –demonstration
8.	Interpretation of laboratory reports (serological tests, LFT, RFT, TFT etc ) and its clinico pathological correlation
9.	Demonstration of common pathological specimens/models from each system
10.	Demonstration of common Pathological slides from each system

#### 4. Teaching hours

##### 4.1 Gross division of teaching hours

Pathology & Microbiology		
Year	Teaching hours- Lectures	Teaching hours- Non-lectures
II BHMS	200	80

##### 4.2 Teaching hours theory

Sr. No	Topic	Hours
	<b>Paper I</b>	
1.	Introduction	3
	<b>General Pathology</b>	
1.	Cell Injury and cellular adaptation	10
2.	Inflammation and repair	10
3.	Neoplasia	10
4.	Immunopathology	8
5.	Haemodynamic disorders	10
6.	Environmental and Nutritional diseases	2

	<b>Systemic Pathology</b>	
1.	Diseases of the Haematopoietic system, bone marrow and blood	9
2.	Diseases of the Respiratory system.	5
3.	Diseases of the the oral cavity,salivary glands and gastro intestinal tract	6
4.	Diseases of liver, gall bladder, and biliary ducts	4
5.	Diseases of the Pancreas	1
6.	Diseases of blood vessels and lymphatics	2
7.	Diseases of Cardiovascular system	5
8.	Diseases of kidney and lower urinary tract	6
9.	Diseases of male reproductive system and prostate	1
10.	Diseases of the female genitalia and breast	4
11.	Diseases of the skin and soft tissue	1
12.	Diseases of the musculo-skeletal system.	2
13.	Diseases of Endocrine glands -thyroid	2
14.	Diseases of nervous system	1
	<b>Total</b>	<b>102</b>

	<b>Paper II</b>	
	<b>Microbiology and Parasitology</b>	
1.	General introduction, Bacterial structure, growth and metabolism & genetics	3
2.	Identification and cultivation of bacteria( staining, culture medias, methods)	3
3.	Sterilization and disinfection	2
4.	Infection and disease	2
5.	Gram positive cocci	5
6.	Gram negative cocci	2
7.	Gram positive aerobic bacilli	2
8.	Gram positive anaerobic bacilli	3
9.	Gram negative bacilli	9
10.	Acid Fast Bacterias	4
11.	Spirochaetes	3
12.	Fungi- general characters- cutaneous, systemic mycosis, opportunistic	3
13.	Introduction to parasitology	2
14.	Protozoans	9
15.	Helminths –cestodes, trematodes and nematodes	14
16.	Virology-introduction &,Bacteriophages	2
17.	DNA virus	11
18.	RNA viruses	12
19.	Emerging and re-emerging diseases	2
20.	Human Microbiome- homoeopathic concept	3
21.	Diagnostic procedures in Microbiology	2
	<b>Total</b>	<b>98</b>

### 4.3 Teaching hours Non-lecture

Sl. No.	Practicals	60 hrs
1.	Demonstration of common and latest equipments used in pathology and microbiology laboratory	4
2.	Estimation of haemoglobin (by acidometer)	2
3.	Total count of Red Blood Cells	2
4.	Total count of White Blood Cells,	2
5.	Bleeding time and Clotting time.	2
6.	Blood grouping.	2
7.	Staining of thin and thick films- demonstration	2
8.	Differential count of WBC	2
9.	Erythrocyte sedimentation rate -demonstration	2
10.	Urine examination physical, chemical and microscopical examination.	4
11.	Examination of Faeces- demonstration of physical, chemical (occult blood)and microscopical for ova and protozoa.	2
12.	Demonstration of Methods of sterilisation	2

13.	Common culture medias- demonstration	1
14.	Gram staining	2
15.	Acid fast staining – demonstration	2
16.	Hanging drop preparation.- demonstration	2
17.	Interpretation of laboratory reports (serological tests, LFT, RFT, TFT etc ) and its clinico pathological correlation.	5
18.	Demonstration of common pathological specimens/models	10
19.	Demonstration of common histopathological slides	10
	<b>Demonstrative Activities</b>	<b>20</b>
1.	Seminar/tutorials/ Symposium	8
2.	PBL/CBL	6
3.	Group discussion	6

## 5. Content mapping (competencies tables)

### 5.1. Introduction to Pathology-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomU G-Path M.1.1	KS	K	Basic definitions	Define the terms “Pathology”, “Pathophysiology”, “Health”, “Disease”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M.1.2	KS	K	Branches of Pathology	State the branches of Pathology	C1	MK	Lecture Slide presentation	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M.1.3	KS	K	Contributions of important scientists to Pathology	List the contribution of important scientists to Pathology	C1	NK	Lecture Slide presentation	Viva Voce MCQ	NA	
HomU G-Path M.1.4	KS	K	Common terms for study of diseases	Enumerate the common terms for study of diseases	C1	MK	Lecture Slide presentation	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M.1.5	KS	K	Definition of health as per Homoeopathic philosophy	Define Health according to Homoeopathic concept – Aphorism -9	C1	MK	Lecture Slide presentation	Viva Voce MCQ	Viva Voce MCQ	Organon of Medicine



HomU G-Path M.1.6	KS	K	Definition of disease as per Homoeopathic philosophy	Define Disease according to Homoeopathic concept- Aphorism -11	C1	MK	Lecture Slide present ation	Viva Voce MCQ	Viva Voce MCQ	Organon of Medicine
HomU G-Path M.1.7	KS	K	Homoeopathic concept of evolution of disease and cure	Describe the Homoeopathic concept of evolution of disease and cure	C1	MK	Lecture Slide present ation	Viva Voce SAQ	Viva Voce SAQ	Organon of Medicine

### 5.2. Cell injury and cellular adaptation-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomU G-Path M 2.1	KS	K	Definition of Cell injury	Define the term “Cell injury”	C 1	MK	Lecture Slide present ation	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M 2.2	KS	K	Etiology of cell injury	Describe the causes of cell injury	C 1	MK	Lecture Slide present ation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ	
HomU G-Path M 2.3	KS	KH	Cellular response to injurious stimuli	Describe the types of cellular response to injurious stimuli and stress.	C 2	MK	Lecture Slide present ation	Viva Voce MCQ	Viva Voce SAQ MCQ	

HomU G-Path M 2.4	KS	K	Cellular adaptation	Define the term “cellular adaptation”	C 1	MK	Lecture	Viva Voce SAQ	Viva Voce SAQ LAQ	
HomU G-Path M 2.5	KS	K		Discuss the various types of cellular adaptation with examples	C 1	MK	Lecture Slide present ation	Viva Voce MCQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.6	KS	K	Atrophy	Define the term “atrophy”	C 1	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.7	KS	KH		Explain the etiopathogenesis atrophy with examples	C 2	MK	Lecture Slide present ation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.8	KS	KH		Describe the morphologic features of atrophied cell	C 2	MK	Lecture Slide present ation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.9	KS	K	Hyperplasia	Define the term “Hyperplasia”	C 1	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	

HomU G-Path M 2.10	KS	KH		Describe types of hyperplasia with examples	C 2	MK	Lecture Slide presentation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.11	KS	KH		Discuss the morphologic features of hyperplasia	C 2	MK	Lecture Slide presentation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.12	KS	K	Hypertrophy	Define the term hypertrophy	C 1	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.13	KS	KH		Describe the types of hypertrophy with examples.	C 2	MK	Lecture Slide presentation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.14	KS	KH		Describe the morphologic features of hypertrophy	C 2	MK	Lecture Slide presentation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.15	KS	KH	Differences between Hypertrophy and Hyperplasia	Enumerate differences between Hypertrophy and Hyperplasia	C 2	MK	Lecture Slide presentation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	

HomU G-Path M 2.16	KS	K	Metaplasia	Define the term “Metaplasia”	C 1	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.17	KS	KH		Describe the types of metaplasia with examples.	C 2	MK	Lecture  Slide present ation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.18	KS	K	Dysplasia	Define the term “Dysplasia”	C 1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.19	KS	KH		Explain the cytological changes in Dysplasia	C 2	MK	Lecture Slide present ation	Viva Voce MCQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.20	KS	KH	Biochemical and ultra structural changes in reversible cell injury	Describe the sequential biochemical and ultrastructural changes in reversible cell injury due to Ischaemia and hypoxia	C 2	MK	Lecture Slide present ation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M 2.21	KS	KH	Biochemical and ultrastructural changes in Irreversible cell injury	Describe the sequential biochemical and ultrastructural changes in irreversible cell injury due to Ischaemia and hypoxia	C 2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce SAQ MCQ LAQ	

HomU G-Path M 2.22	KS	KH	Pathogenesis of cell injury	Describe the pathogenesis of Free Radical-mediated cell injury	C 2	MK	Lecture Slide present ation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ	
HomU G-Path M 2.23	KS	K	Morphology of Reversible cell injury	Enumerate the common morphologic forms of reversible cell injury	C1	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.24	KS	K	Hydropic change	Define the term “Hydropic change”	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.25	KS	KH	Hydrophic change	Describe the etiopathogenesis of Hydropic change	C 2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.26	KS	KH		Describe morphology of hydropic change with an example	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.27	KS	K	Fatty change	Define the term “Fatty change”	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	

HomU G-Path M 2.28	KS	KH		Describe the etiopathogenesis of Fatty change	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.29	KS	KH		Describe morphology of Fatty change in various organs	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.30	KS	KH	Types of mucoid change with examples	Describe the types of mucoid change with examples	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ	
HomU G-Path M 2.31	KS	KH	Types of Hyaline change with examples	Describe the types of hyaline change with examples	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ	
HomU G-Path M 2.32	KS	K	Morphological forms of Irreversible cell injury	List the Morphological forms of Irreversible cell injury	C 1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M 2.33	KS	K	Necrosis	Define the term “Necrosis”	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	

HomU G-Path M 2.34	KS	K		Describe the types of Necrosis with examples	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.3 5	KS	K	Coagulative Necrosis	Describe the etiopathogenesis of Coagulative necrosis	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.3 6	KS	KH		Describe the morphological features of Coagulative necrosis in affected organs	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.3 7	KS	KH	Liquefactive necrosis	Describe the etiopathogenesis of liquefactive necrosis	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.3 8	KS	KH		Describe the morphological features of liquefactive necrosis in affected organs	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.39	KS	KH	Differences between coagulative necrosis and liquefactive necrosis	Enumerate differences between coagulative necrosis and liquefactive necrosis	C 2	MK	Lecture Slide presentation	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ	

HomU G-Path M 2.40	KS	KH	Caseous necrosis	Describe the etiopathogenesis caseous necrosis	C 2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.41	KS	KH		Describe the morphological features of caseous necrosis in affected organs	C 2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.42	KS	KH	Fat necrosis	Describe the etiopathogenesis, morphological features of fat necrosis	C2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.43	KS	KH	Fibrinod necrosis	Describe the etiopathogenesis, microscopic features of fibrinod necrosis	C2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.4 4	KS	K	Gangrene	Define the term “Gangrene”	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery
HomU G-Path M 2.4 5	KS	K		State the types of gangrene	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery



HomU G-Path M 2.4 6	KS	KH	Dry gangrene	Explain the etiopathogenesis morphological features of dry gangrene with examples	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery
HomU G-Path M 2.4 7	KS	KH	Wet gangrene	Describe the etiopathogenesis morphological features of wet gangrene with examples	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery
HomU G-Path M 2.4 8	KS	KH	Differences between dry gangrene and wet gangrene	Enumerate the differences between dry gangrene and wet gangrene	C 2	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ	
HomU G-Path M 2.49	KS	KH	Etiopathology of Gas gangrene	Explain the etiopathogenesis and morphological features of Gas gangrene	C 2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M 2.50	KS	K	Pathological calcification	Define the term “Pathological calcification”	C 1	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.51	KS	KH		Enumerate the types of pathological calcification	C 1	MK	Lecture Slide present ation	MCQ Viva Voce	MCQ Viva Voce	

HomU G-Path M 2.52	KS	KH		Describe the etiopathogenesis of Dystrophic calcification with examples	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.53	KS	KH		Describe the etiopathogenesis of Metastatic calcification with examples	C 2	MK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.54	KS	KH		Enumerate the differences between Dystrophic calcification and Metastatic calcification	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.55	KS	K	Apoptosis	Define the term “Apoptosis”	C 1	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.56	KS	KH		Describe the role of apoptosis in pathologic processes with examples	C 2	DK	Lecture Slide presentation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M 2.57	KS	K	Intracellular accumulation	Define the term “Intracellular accumulations”	C 1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	

HomU G-Path M 2.58	KS	KH		Enumerate the types of abnormal intracellular accumulations with examples	C 2	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M 2.59	KS	K	Definition of Xanthomas, “Russell bodies”, “Mallory body”, “Brown atrophy”, “Heart failure cells”	Define the terms “Xanthomas”, “Russell bodies”, “Mallory body”, “Brown atrophy”, “Heart failure cells”	C 1	DK	Lecture	Viva Voce MCQ	Viva Voce MCQ	

### 5.3. Inflammation and repair-

Sl.No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomU G-Path M.3.1	KS	K	Inflammation	Define the term “Inflammation”	C 1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology
HomU G-Path M.3.2	KS	K	Causes of inflammation	State the Causes of inflammation	C 1	MK	Lecture	Viva Voce SAQ	Viva Voce SAQ	
HomU G-Path M.3.3	KS	K	Types of inflammation	State the types of Inflammation	C 1	MK	Lecture	Viva Voce MCQ	SAQ Viva Voce MCQ	

HomU G-Path M.3.4	KS	K	Cardinal signs of inflammation	State the cardinal signs of inflammation	C 1	MK	Lecture	Viva Voce MCQ	SAQ Viva Voce MCQ	
HomU G-Path M.3.5	KS	K	Definition of Acute inflammation”	Define the term “Acute inflammation”	C 1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	
Hom UG- Path M.3.6	KS	KH	Vascular events of the acute inflammation	Describe the mechanism of vascular events in acute inflammatory response	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
Hom UG- Path M.3.7	KS	KH	Cellular phase of acute inflammation	Describe the steps of cellular phase of acute inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
Hom UG- Path M.3.8	KS	KH	Process of Phagocytosis	Describe the three processes of Phagocytosis in cellular phase of acute inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.3.9	KS	K	Chemical mediators of inflammation	List the Chemical mediators of inflammation	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
Hom UG- Path M II.3.10	KS	KH	Role of cell derived Chemical mediators	State the various sources and functions of cell derived chemical mediators of inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	

HomU G-Path M.3.11	KS	KH	Role of plasma derived Chemical mediators	State the various sources and functions of Plasma derived chemical mediators of inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.3.12	KS	KH	Inflammatory cells	Describe the functions of cells participating in acute and chronic inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.3.13	KS	KH	Giant cells	Describe the three types of macrophages derived giant cells	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.3.14	KS	K	Morphologic Patterns of Acute Inflammation	State the Morphologic Patterns of Acute Inflammation	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.3.15	KS	KH	Classification of inflammatory lesion	Describe the classification of inflammatory lesion based on duration, type of exudates, and anatomic location affected in acute inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ	
HomU G-Path M.3.16	KS	KH	Systemic effects of inflammation	Describe the systemic effects of acute inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ	

HomU G-Path M.3.17	KS	KH	Outcomes of Acute Inflammation	Describe the end result of Acute Inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ	
HomU G-Path M.3.18	KS	K	Chronic inflammation	Define the term “chronic inflammation”	CI	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.3.19	KS	K	Types of chronic inflammation	Mention the types of chronic inflammation	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.3.20	KS	KH	Morphologic Features of chronic inflammation	Describe the general features of chronic inflammation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.3.21	KS	KH	Granulomatous inflammation	Describe chronic non-specific inflammation with examples	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G- PathM. 3.22	KS	KH	Granuloma	Describe the mechanism of evolution of a granuloma	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	

Hom UG- Path M 3.23	KS	KH		Describe the morphology of granuloma	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M 3.24	KS	K	Examples of granulomatous inflammation	State common examples of granulomatous inflammation	C1	MK	lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M 3.25	KS	KH	Systemic effects of chronic inflammation	State the systemic effects of chronic inflammation	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ	
HomU G-Path M.3.26	KS	K	Definition of Healing	Define the term “Healing”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.3.27	KS	KH	Repair and regeneration	Describe the processes involved in repair and regeneration	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.3.28	KS	KH	Wound healing by primary intention	Describe Wound healing by primary intention	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery

HomU G-Path M.3.29	KS	KH	Wound healing by secondary intention	Describe Wound healing by secondary intention	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery
HomU G-Path M.3.30	KS	KH	Complications in healing of skin wounds	Describe the complications in healing of skin wounds	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Surgery
HomU G-Path M.3.31	KS	K	Wound healing	Discuss difference in wound healing by primary and secondary intention	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.3.32	KS	K	Factors modifying the healing process	Explain the process of Fracture Healing	CI	NK	Lecture	Viva Voce	NA	
HomU G-Path M.3.33	KS	KH	Homoeopathic aspect in inflammation	Correlate the events of inflammation and outcome of various types of inflammation with miasm and representation in repertory and different MateriaMedica.	C 2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	OM, MM, Repertory



#### 5.4. Haemodynamic disorders

Sl. No.	Domains of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomU G-Path M.4.1	KS	K	Definition of Oedema.	Define the term “Oedema”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology
HomU G-Path M.4.2	KS	KH	Types of Oedema.	Describe the pathogenesis of oedema	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.4.3	KS	KH	Transudate and exudate	Enumerate the differences between transudate and exudate	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.4.4	KS	KH	Etiopathogenesis of Oedema	Describe the etiopathogenesis of various types of oedema with its clinical correlation	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.4.5	KS	K	Definition of Hyperaemia	Define the term “Active Hyperemia”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	

HomU G-Path M.4.6	KS	K	Definition of Venous congestion	Define the term “Venous congestion” or “Passive hyperaemia”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M.4.7	KS	KH	Chronic venous congestion	Describe the mechanisms involved in chronic venous congestion of different organs	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.4.8	KS	KH		Explain morphology of Chronic Venous Congestion in Lung	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.4.9	KS	K	Definitions	Define the terms “Haemorrhage”, “Haematoma”, “Ecchymosis”, “Purpuras”, “Petechiae”,	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Forensic medicine
HomU G-Path M.4.10	KS	K	Shock	Define the term “Shock”	C1	MK	Lecture	Viva Voce MCQS AQ	Viva Voce MCQ SAQ LAQ	
Hom UG- Path M 4.11	KS	K		Classify shock based on aetiology	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery
Hom UG- Path M 4.12	KS	KH		Describe the pathogenesis of various types of shock	C2	MK	Lecture	Viva Voce MCQS AQ	Viva Voce MCQ SAQ LAQ	

Hom UG- Path M 4.13	KS	KH		Describe the stages of shock	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery
Hom UG- Path M.4.14	KS	K	Thrombosis	Define the term “Thrombosis” ;“Thrombus” .	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
Hom UG- Path M.4.15	KS	K		Enumerate the primary events in Thrombogenesis-Virchow’s triad	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
Hom UG- Path M.4.16	KS	KH		Describe the etio-pathogenesis of thrombosis	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
Hom UG- Path M.4.17	KS	KH		Describe the morphologic features of thrombi	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M.4.18	KS	KH		Describe the fate of thrombus	C2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	

Hom UG- Path M.4.19	KS	KH	Clinical effects of thrombi	Describe the clinical effects of various types of thrombi	C2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M.4.20	KS	K	Embolism	Define the term “Embolism”, “Embolus”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	
Hom UG- Path M 4.21	KS	K		Describe the various types of Emboli	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M 4.22	KS	KH	Etiopathogenesi s of Pulmonary thromboembolis m	Describe the aetiopathogenesis of Pulmonary thromboembolism	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M 4.23	KS	KH	Pathogenesis of Thromboemboli sm	Describe the consequences of pulmonary thromboembolism	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Practice of medicine
Hom UG- Path M 4.24	KS	KH	Pathogenesis of fat embolism	Describe the pathogenesis of fat embolism	C2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ	

Hom UG- Path M.4.25	KS	KH	Pathogenesis of air embolism	Describe the pathogenesis of air embolism	C2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ	
Hom UG- Path M.4.26	KS	KH	Pathogenesis of amniotic fluid embolism	Describe the pathogenesis amniotic fluid embolism	C2	NK	Lecture	NA		
Hom UG- Path M.4.27	KS	K	Ischaemia	Define the term “Ischaemia”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M.4.28	KS	KH		Describe the etiopathogenesis of Ischaemia	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M.4.29	KS	KH		Describe the factors determining severity of Ischaemic injury	C2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M.4.30	KS	K	Infarction	Define the term “Infarction”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
Hom UG- Path M.4.31	KS	KH		Describe the etiopathogenesis of Infarction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Practice of medicine

Hom UG- Path M.4.32	KS	K		State the types of Infract	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
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### 5.5. Immunopathology-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priorit y	TL MM	Assessment		Integration
								F	S	
HomU G-Path M.5.1	KS	K	Definition of Immunity	Define the term “Immunity”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology
HomU G-Path M.5.2	KS	K	Types of immunity	State the types of immunity	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology
HomU G-Path M.5.3	KS	KH	Components of Innate immunity	Describe the four components of Innate immunity	C2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Physiology
HomU G-Path M.5.4	KS	KH	Functions of Innate immunity	Describe the functions of Innate immunity	C2	MK	Lecture Slide present ation	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Physiology

HomU G-Path M.5.5	KS	K	Definition of Adaptive immunity”	Define the term “Adaptive immunity”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.6	KS	K	Classification of Adaptive immunity	Classify Adaptive immunity with examples for each type	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.7	KS	KH	Features of Active immunity	Describe the features of Active immunity	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.8	KS	KH	Features of Passive immunity	Describe the features of Passive immunity	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.9	KS	K	Local immunity	Explain Local immunity	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.10	KS	K	Herd immunity	Explain Herd immunity	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.11	KS	K	Organs of immune system	State the organs of immune system	C1	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	Physiology

HomU G-Path M.5.12	KS	K	Cells and Organs of Immune system	State the cells of the immune system	C1	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	Physiology
HomU G-Path M.5.13	KS	KH	Humoral immunity	Explain the mechanism of humoral immunity	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Physiology
HomU G-Path M.5.14	KS	KH	Differences between Primary and Secondary immune response	Enumerate the differences between Primary and Secondary immune response”	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.15	KS	KH	Mechanism of cell mediated immunity	Describe the mechanism of cell mediated immunity	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.16	KS	K	Definition of “Antigen”	Define the term “Antigen”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology
HomU G-Path M.5.17	KS	K	Definition of “Antibody”, “Immunoglobu lin”	Define the terms “Antibody”, “Immunoglobulin”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology



HomU G-Path M.5.18	KS	K	Immunoglobulin and their function	State the types of Immunoglobulin classes and their function.	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.19	KS	KH	Biological functions of Complement	Describe the biological functions of Complement	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.20	KS	K	Types of antigen-antibody reaction with examples	Discuss the types of antigen-antibody reactions with examples	C1	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.21	KS	K	Definition of Hypersensitivity	Define the term "Hypersensitivity"	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.22	KS	K	Types of hypersensitivity reactions	List the types of hypersensitivity reactions	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.23	KS	KH	Type I Hypersensitivity	Describe the mechanism of type I hypersensitivity reaction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	

HomU G-Path M.5.24	KS	KH	Type I Hypersensitivity reaction with examples	Describe the examples of type I hypersensitivity reaction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.25	KS	KH	Type II Hypersensitivity reaction	Describe the mechanism of type II hypersensitivity reaction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.26	KS	KH	Type II Hypersensitivity reaction – examples	Describe the examples of type II hypersensitivity reaction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.27	KS	KH	Type III Hypersensitivity reaction	Describe the mechanism of type III hypersensitivity reaction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.28	KS	KH	Type III Hypersensitivity reaction – examples	Describe the examples of type III hypersensitivity reaction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	

HomU G-Path M.5.29	KS	KH	Type IV Hypersensitivity reaction	Describe the mechanism of type IV hypersensitivity reaction	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.30	KS	KH	Type IV Hypersensitivity reaction – examples	Describe the examples of type IV hypersensitivity reaction	C2	MK	Lecture	Viva Voce SAQ MCQ	Viva Voce SAQ MCQ LAQ	
HomU G-Path M.5.31	KS	K	Autoimmunity	Define the term “Autoimmunity”	C1	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.32	KS	KH		Describe the pathogenesis of autoimmunity	C2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.33	KS	K	Autoimmune diseases	State the autoimmune diseases	C1	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.34	KS	K	Amyloidosis	Define the term “Amyloidosis”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.35	KS	K		Classify amyloidosis	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	

HomU G-Path M.5.36	KS	KH		Describe the pathogenesis of amyloidosis	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.5.37	KS	KH		Describe the features of amyloidosis of various organs .	C2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.5.38	KS	K	Homoeopathic concept of immunity	Explain the concept of immunity and hypersensitivity and correlate it with the Homoeopathic concepts of susceptibility	C1	NK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Organon of Medicine

#### 5.6. Neoplasia-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomU G-Path M.6.1	KS	K	Definition of Neoplasia	Define the term “Neoplasia”	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.2	KS	K	Nomenclature of tumours	Explain the nomenclature of tumours	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	

HomU G-Path M.6.3	KS	K	Classification of tumours	Classify tumours based on histogenesis and anticipated behaviour	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.4	KS	K	Special categories of tumours	State the special categories of tumours with examples	C 1	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.5	KS	K	Characteristics of benign and malignant neoplasms	State the characteristics of tumours	C 1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.6	KS	KH	Differentiating features of benign and malignant neoplasms	Differentiate benign and malignant neoplasms based on the clinical and gross features	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.7	KS	KH		Differentiate benign and malignant neoplasms based on microscopic features	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.8	KS	K	Definition of “Differentiation”, “Anaplasia”	Define the terms “Differentiation”, “Anaplasia”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	

HomU G-Path M.6.9	KS	KH	Differentiating features of benign and malignant neoplasms	Differentiate benign and malignant neoplasms based on their rate of growth	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.10	KS	KH		Differentiate benign and malignant neoplasms based on their spread - local invasion and metastasis	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.17	KS	K	Definition of Metastasis	Define the term “Metastasis”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.18	KS	K	Routes of Metastasis	Discuss the routes of Metastasis with examples	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	Surgery
HomU G-Path M.6.19	KS	KH	Lymphatic spread of malignant tumours	Describe the mechanism of lymphatic spread of malignant tumours	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.20	KS	KH	Haematogenous metastasis	Describe the mechanism of Haematogenous spread of malignant tumours	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	

HomU G-Path M.6.21	KS	KH	Spread of cancer along body cavities and natural passages	Describe the mechanism of spread of cancer along body cavities and natural passages	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.22	KS	KH	Molecular basis of cancer	Describe Molecular basis of cancer	C2	NK	Lecture	NA	NA	
HomU G-Path M.6.23	KS	K	Definition of Carcinogenesis , Carcinogen	Define the terms “Carcinogenesis”, “Carcinogen”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ	
HomU G-Path M.6.24	KS	K	Carcinogens	Enumerate the various types of carcinogens	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.25	KS	KH	Chemical Carcinogenesis	Describe the three sequential stages in chemical carcinogenesis	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ LAQ	
HomU G-Path M.6.26	KS	KH	Physical carcinogenesis	Describe the mechanism of physical carcinogenesis	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	

HomU G-Path M.6.27	KS	KH	Biological carcinogenesis	Describe the mechanism of biological carcinogenesis	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.28	KS	KH	Effects of tumour on the host	Describe the effects of tumour on the host	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.29	KS	K	Definition of Paraneoplastic syndromes	Define the term “Paraneoplastic syndromes”	C1	MK	Lecture	Viva Voce MCQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.30	KS	KH	Paraneoplastic syndromes	State the various clinical syndromes included in Paraneoplastic syndromes	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.31	KS	KH	Definition of “Grading”, “Staging”	Define the terms “Grading”, “Staging”	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Surgery
HomU G-Path M.6.32	KS	KH	Tumour grading	Explain about the grading of tumour.	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Surgery
HomU G-Path M.6.33	KS	KH	Staging tumours of	Explain about the staging of tumour	C2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Surgery



HomU G-Path M.6.34	KS	K	Laboratory Diagnosis of Cancer	State the various methods of Laboratory diagnosis of tumours	C1	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.35	KS	K	Tumour markers	State the important liquid based biomarkers in tumour diagnosis	C1	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	
HomU G-Path M.6.36	KS	KH	Homoeopathic concept	Discuss about the miasmatic concept of neoplastic disorder	C 2	DK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	OM,MM,Re pertory

### 5.7. Environmental and nutritional diseases-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priorit y	TL MM	Assessment		Integration
								F	S	
HomU G-Path M.7.1	KS	KH	Obesity	Define the term “Obesity”	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology Community medicine
HomU G-Path M.7.2	KS	KH	Obesity	Describe the etiopathogenesis of Obesity	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology Community medicine
HomU G-Path M.7.3	KS	KH	Pathogenesis of protein energy malnutrition	Describe the pathogenesis of protein energy malnutrition	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology Community medicine

HomU G-Path M.7.4	KS	KH	Difference between Kwashiorkor and marasmus	Enumerate the differences between Kwashiorkor and Marasmus	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology Community medicine
HomU G-Path M.7.5	KS	KH	Vitamin A	Describe the lesions in Vitamin A deficiency	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology Community medicine
HomU G-Path M.7.6	KS	KH	Vitamin C	Describe the lesions in Vitamin C deficiency	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology Community medicine
HomU G-Path M.7.7	KS	KH	Vitamin D	Describe the lesions in Vitamin D deficiency	C 2	MK	Lecture	Viva Voce MCQ SAQ	Viva Voce MCQ SAQ	Physiology Community medicine
HomU G-Path M.7.8	KS	KH	Vitamin E	Describe the lesions in Vitamin E deficiency	C 2	DK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology Community medicine
HomU G-Path M7.9	KS	KH	Vitamin K	Describe the lesions in Vitamin K deficiency	C 2	DK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology Community medicine
HomU G-Path M.7.10	KS	KH	Vitamin B1	Describe the lesions in Vitamin B1(Thiamine) deficiency	C 2	DK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology Community medicine
HomU G-Path M.7.11	KS	KH	Vitamin B2	Describe the lesions in Vitamin B2 (Riboflavin) deficiency	C 2	DK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology Community medicine

HomU G-Path M.7.12	KS	KH	Vitamin B3	Describe the lesions in Vitamin B3 (Niacin) deficiency	C 2	DK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology , Community medicine
HomU G-Path M.7.13	KS	KH	Vitamin B6	Describe the lesions in Vitamin B 6 (Pyridoxine) deficiency	C 2	DK	Lecture	Viva Voce MCQ	Viva Voce MCQ	Physiology , Community medicine

### 5.8. Diseases of the haematopoietic system, bone marrow and blood-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priorit y	TL MM	Assessment		Integration
								F	S	
HOMU G-Path M. 8.1	KS	K	Red cell disorders	Define the term “Anaemia” Megaloblastic Anaemia”	C 1	MK	Lecture	Viva MCQ	SAQ Viva voce MCQ	Physiology
HOMU G-Path M. 8.2	KS	KH	Classification of Anaemia	State the patho-physiologic classification of anaemia	C 2	MK	Lecture	Viva voce, MCQ	LAQ SAQ Viva .MCQ	Physiology
HOMU G-Path M. 8.3	KS	K		State the morphologic classification of anaemia	C 1	MK	Lecture	Viva voce, MCQ	LAQS AQ. Viva MCQ	Physiology
HOMU G-Path M. 8.4	KS	KH		Explain the scheme of laboratory investigations for anaemia	C 2	MK	Lecture	Viva voce, MCQ	LAQ, SAQ. Viva . MCQ	Physiology Practice of medicine
HOMU G-Path M. 8.5	KS	K	Iron deficiency Anaemia	Define Iron deficiency Anaemia	C 1	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Physiology

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMU G-Path M. 8.6	KS	KH		Describe the etio-pathogenesis of Iron deficiency anaemia	C 2	MK	Lecture	Viva voce, MCQ	LAQ SAQ. Viva . MCQ	
HOMU G-Path M. 8.7	KS	KH		Describe the laboratory findings of iron deficiency anaemia	C 2	MK	Lecture	Viva voce, MCQ	LAQ SAQ Viva MCQ	Practice of medicine
HOMU G-Path M. 8.8	KS	KH	Megaloblastic Anaemia	Describe the etio-pathogenesis of Megaloblastic anaemia	C 2	MK	Lecture	Viva voce, MCQ	LAQ SAQ Viva MCQ	
HOMU G-Path M. 8.9	KS	KH		Describe the laboratory diagnosis of Megaloblastic Anaemia	C 2	MK	Lecture	Viva voce, MCQ	LAQ SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.10	KS	K	Pernicious Anaemia	Define Pernicious Anaemia	C 1	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.11	KS	KH		Discuss the etio- pathogenesis of Pernicious Anaemia	C 2	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.12	KS	KH		Discuss the laboratory diagnosis of Pernicious Anaemia	C 2	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.13	KS	K	Haemolytic Anaemia	Define the term “Haemolytic Anaemia”	C 1	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMU G-Path M. 8.14	KS	KH		Classify Haemolytic Anaemias	C2	MK	Lecture	Viva voce, MCQ	LAQ SAQ. Viva . MCQ	
HOMU G-Path M. 8.15	KS	KH		Describe laboratory evaluation of Haemolytic Anaemia	C 2	MK	Lecture	Viva voce, MCQ	LAQ SAQ. Viva . MCQ	
HOMU G-Path M. 8.16	KS	K	types of Haemoglobinopathies	Classify Haemoglobinopathies	C 1	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.17	KS	K	Sickle cell Anaemia	Define Sickle cell Anaemia	C 1	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.18	KS	KH		Discuss the etio-pathogenesis of sickle cell anaemia	C2	DK	Lecture	Viva voce, MCQ	LAQS AQ. Viva . MCQ	
HOMU G-Path M. 8.19	KS	KH		Discuss the laboratory findings of sickle cell anaemia	C 2	DK	Lecture	Viva voce, MCQ	LAQS AQ. Viva . MCQ	
HOMU G-Path M. 8.20	KS	K	Thalassemia	Define Thalassemia	C 1	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMU G-Path M. 8.21	KS	KH		Classify Thalassaemia	C 2	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.22	KS	KH		Discuss the pathophysiology of anaemia in Thalassemia	C 2	MK	Lecture	Viva voce, MCQ	LAQS AQ. Viva . MCQ	
HOMU G-Path M. 8.23	KS	KH		Describe the laboratory findings of Thalassaemia.	C 2	MK	Lecture	Viva voce, MCQ	LAQS AQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.24	KS	K	Aplastic anaemia.	Define the term “Aplastic anaemia”	C 1	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.25	KS	KH	.	State the etiology of Aplastic anaemia.	C 2	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.26	KS	KH		Describe laboratory findings of Aplastic anaemia.	C 2	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.27	KS	K	Polycythaemia	Define Polycythaemia	C 1	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMU G-Path M. 8.28	KS	KH	Classification of Polycythaemia	Classify Polycythaemia on the basis of etiology	C2	DK	Lecture ,	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.29	KS	KH	laboratory diagnosis of Polycythaemia	Describe laboratory features of Polycythaemia	C2	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.29	KS	K	WBC disorders	Define the terms “Leukocytosis” “Leukopenia”, “Leukaemoid reaction”, “Leukaemias”	C 1	MK	Lecture	Viva voce, MCQ	Viva MCQ	
HOMU G-Path M. 8.30	KS	KH	Leukaemia	Classify Leukaemias	C2	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.31	KS	K		Describe the aetiology of Leukaemia	C1	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.32	KS	KH	Leukaemia	Describe the laboratory diagnosis of Chronic Myeloid Leukaemia	C 2	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.33	KS	KH		Describe the laboratory diagnosis of Acute Myeloid Leukaemia	C 2	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Practice of medicine

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMU G-Path M. 8.34	KS	KH	Haemorrhagic disorders	Describe the laboratory diagnosis of Acute lymphoblastic Leukaemia	C 2	MK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.35	KS	K		State the aetiology of bleeding disorders	C 1	MK	Lecture	Viva SAQ MCQ	Viva SAQ MCQ	
HOMU G-Path M. 8.36	KS	K		Define Haemophilia A	C 1	MK	Lecture	Viva MCQ	Viva MCQ	
HOMU G-Path M. 8.37	KS	K		Describe the laboratory features of Haemophilia A	C 1	MK	Lecture	Viva MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.38	KS	K		Define the terms “Thrombocytopenia”, “Thrombocytosis”	C 1	MK	Lecture	Viva MCQ	Viva . MCQ	
HOMU G-Path M. 8.39	KS	K		State the causes of Thrombocytopenia	C 1	MK	Lecture	Viva SAQ MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.40	KS	KH	Plasma cell myeloma	Define multiple myeloma.	C 2	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	



Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMU G-Path M. 8.41	KS	KH	Plasma cell myeloma	Describe the laboratory diagnosis of Multiple myeloma	C 2	DK	Lecture	Viva voce, MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.42	KS	K	Hodgkin's lymphoma	Discuss features of Hodgkin's lymphoma	C1	DK	Lecture	Viva SAQ MCQ	SAQ. Viva . MCQ	Practice of medicine
HOMU G-Path M. 8.43	KS	K		Explain the appearance of Reed Sternberg cell in tissues	C 1	DK	Lecture	Viva SAQ MCQ	SAQ. Viva . MCQ	
HOMU G-Path M. 8.44	KS	K		Discuss features of Non Hodgkin's lymphoma	C 1	NK	Lecture	Viva SAQ MCQ	NA	Practice of medicine
HOMU G-Path M. 8.45	KS	K	Splenomegaly	State the causes of Splenomegaly	C1	DK	Lecture	Viva SAQ MCQ	Viva SAQ MCQ	

### 5.9. Diseases of the Respiratory System

I. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 9.1	KS	K	Pulmonary Tuberculosis	Describe the three components of Primary complex or Ghon complex	C 1	MK	Lecture	Viva LAQ SAQ MCQ	LAQ SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.2	KS	K		Describe the fate of primary tuberculosis	C1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ Viva MCQ	
HOMUG-Path M. 9.3	KS	K		Describe the morphology of Secondary pulmonary tuberculosis	C1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ Viva MCQ	
HOMUG-Path M. 9.4	KS	K		Enumerate the differences between Primary tuberculosis and Secondary tuberculosis	C1	MK	Lecture	Viva SAQ MCQ	LAQ Viva SAQ MCQ	
HOMUG-Path M. 9.5	KS	K		Describe the fate of secondary pulmonary tuberculosis	C1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ Viva MCQ	
HOMUG-Path M. 9.6	KS	K		Discuss the diagnosis of pulmonary tuberculosis	C1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.7	KS	K	Pneumonia	Define the term "Pneumonia"	C1	MK	Lecture	Viva MCQ	Viva MCQ	

I. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 9.8	KS	K		State the Anatomic classification of Pneumonia	C1	MK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.9	KS	K		State the Aetiologic classification of Pneumonia	C1	MK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.11	KS	KH		Discuss the morphologic features of lobar Pneumonia	C 2	MK	Lecture	Viva LAQ SAQ MCQ	LAQ SAQ Viva MCQ	
HOMUG-Path M. 9.12	KS	K		Discuss the morphologic features of bronchopneumonia	C1	MK	Lecture	Viva SAQ MCQ	Viva SAQ MCQ	
HOMUG-Path M. 9.16	KS	KH		State the complications of Pneumonia	C2	MK	Lecture	Viva voce, MCQ	SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.17	KS	K	Lung abscess	Define the term “Lung abscess”	C1	MK	Lecture	Viva MCQ	Viva MCQ	
HOMUG-Path M. 9.18	KS	KH		Describe aetiopathogenesis of lung abscess	C 2	MK	Lecture	Viva SAQ MCQ	Viva MCQ	Practice of medicine
HOMUG-Path M. 9.19	KS	KH		Explain the morphology of lung abscess	C2	DK	Lecture	Viva SAQ MCQ	Viva MCQ	
HOMUG-Path M. 9.20	KS	K	Obstructive lung diseases	Classify chronic obstructive lung diseases	C1	MK	Lecture	Viva SAQ MCQ	LAQ Viva SAQ MCQ	

I. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 9.21	KS	K	Chronic bronchitis.	Define the term “Chronic Bronchitis”	C1	MK	Lecture	Viva MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.22	KS	KH		Describe the etio-pathogenesis of chronic bronchitis	C2	MK	Lecture	Viva LAQ SAQ MCQ	LAQ SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.23	KS	KH		Describe the morphologic features of chronic bronchitis.	C 2	DK	Lecture	Viva SAQ MCQ	LAQ SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.24	KS	K	Emphysema	Define the term “Emphysema”	C1	MK	Lecture	Viva MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.25	KS	K		Classify Emphysema	C1	MK	Lecture	Viva voce, MCQ	LAQ Viva SAQ MCQ	
HOMUG-Path M. 9.26	KS	KH		Explain the aetio-pathogenesis of Emphysema	C2	MK	Lecture	Viva SAQ MCQ	LAQ Viva SAQ MCQ	Practice of medicine
HOMUG-Path M. 9.27	KS	K	Emphysema	Describe the morphologic features of emphysema.	C1	DK	Lecture	Viva SAQ MCQ	LAQ Viva SAQ MCQ	Practice of medicine
HOMUG-Path M. 9.28	KS	K	Bronchial Asthma	Define the term “Bronchial Asthma”	C1	MK	Lecture	Viva MCQ	SAQ Viva MCQ	

I. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 9.29	KS	K		Classify Bronchial Asthma	C1	MK	Lecture	Viva SAQ MCQ	LAQ Viva SAQ MCQ	
HOMUG-Path M. 9.30	KS	K		Enumerate the differences between Extrinsic Asthma and Intrinsic Asthma	C1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.31	KS	KH		Describe the morphologic features of Bronchial asthma	C 2	MK	Lecture	Viva SAQ MCQ	LAQ Viva SAQ MCQ	
HOMUG-Path M. 9.32	KS	K	Bronchiectasis	Define the term “Bronchiectasis”	C1	MK	Lecture	Viva voce, MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.33	KS	KH		Describe the aetiopathogenesis of bronchiectasis	C 2	MK	Lecture	Viva voce, MCQ	SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.34	KS	K		Describe the morphology of bronchiectasis	C1	MK	Lecture	Viva voce, MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.35	KS	K	Pneumoconiosis	Define the term “Pneumoconioses”	C1	DK	Lecture	Viva MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.36	KS	K		Classify Pneumoconiosis	C1	DK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.37	KS	KH	coal worker’s pneumoconiosis.	Describe the etio-pathogenesis of coal worker’s pneumoconiosis.	C2	DK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	Practice of medicine

I. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 9.38	KS	K	Lung cancer	Describe the morphologic features of coal worker's pneumoconiosis.	C1	DK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.39	KS	K		Describe the aetiology of Lung cancer	C1	DK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	Practice of medicine
HOMUG-Path M. 9.40	KS	K		Describe the morphology of lung cancer	C1	DK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.41	KS	K		Explain the spread of lung cancer	C1	DK	Lecture	Viva SAQ MCQ	SAQ Viva MCQ	
HOMUG-Path M. 9.42	KS	KH		Describe the clinical features of lung cancer	C 2	NK	Lecture	Viva SAQ MCQ	NA	Practice of medicine, Surgery

#### 5.10. Diseases of the oral cavity and salivary glands and gastrointestinal tract-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 10.1	KS	K	Oral leukoplakia	Definition of "Stomatitis", "Glossitis"	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 10.2	KS	K		Define the term "Oral leucoplakia"	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 10.3	KS	K		Describe the aetiology of Oral Leukoplakia	C 1	DK	Lecture	Viva SAQ MCQ	SAQ, MCQ, Viva	Practice of medicine, Surgery

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 10.4	KS	K		Describe the morphologic features of oral leukoplakia	C 1	NK	Lecture	Viva SAQ MCQ	SAQ, MCQ, Viva	Practice of medicine, Surgery
HOMUG-Path M. 10.5	KS	K	Diseases of GI system	Define reflux oesophagitis.	C1	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 10.6	KS	KH	Reflux esophagitis	Describe the aetiopathogenesis of Reflux esophagitis	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva voce	
HOMUG-Path M. 10.7	KS	KH		Describe the morphology of Reflux Oesophagitis	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ MCQ Viva	
HOMUG-Path M. 10.8	KS	KH	Barrett's oesophagus	Describe the aetiopathogenesis, of Barrett oesophagus	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva voce	Practice of medicine, Surgery
HOMUG-Path M. 10.9	KS	K		Describe the morphology of Barret oesophagus	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.10	KS	K	Carcinoma oesophagus	Describe the aetiology of carcinoma oesophagus	C 1	NK	Lecture	NA	NA	Practice of medicine, Surgery

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 10.11	KS	K		Describe the morphology of Carcinoma of oesophagus	C 1	NK	Lecture	Viva SAQ MCQ	NA	
HOMUG-Path M. 10.12	KS	KH		Describe the spread of Carcinoma oesophagus.	C2	NK	Lecture	Viva SAQ MCQ	NA	Practice of medicine, Surgery
HOMUG-Path M. 10.13	KS	K	Gastritis	Classify Gastritis	C 1	MK	Lecture	Viva SAQ MCQ	Viva SAQ MCQ	
HOMUG-Path M. 10.14	KS	K	Gastritis	Describe the aetiopathogenesis of Acute gastritis	C 1	MK	Lecture	Viva SAQ MCQ	Viva MCQ	Practice of medicine, Surgery
HOMUG-Path M. 10.15	KS	K		Describe the aetiopathogenesis of Chronic gastritis	C 1	MK	Lecture	Viva SAQ MCQ	Viva MCQ	
HOMUG-Path M. 10.16	KS	K	Peptic ulcer	Define the term “Peptic ulcer”	C 1	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 10.17	KS	KH		Describe the aetiopathogenesis of chronic peptic ulcer	C 2	MK	Lecture	Viva SAQ MCQ	SAQ MCQ Viva LAQ	Practice of medicine, Surgery



Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 10.18	KS	KH		Describe the morphology of chronic peptic ulcer	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine, Surgery
HOMUG-Path M. 10.19	KS	KH		Describe the complications of Peptic ulcer	C2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine, Surgery
HOMUG-Path M. 10.20	KS	KH		Discuss differences between gastric ulcer and duodenal ulcers.	C2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.21	KS	K	gastric carcinoma,	Describe the aetiology of Gastric carcinoma	C 1	DK	Lecture	Viva SAQ MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 10.22	KS	K	gastric carcinoma,	Describe morphology of gastric carcinoma	C 1	DK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine, Surgery
HOMUG-Path M. 10.23	KS	K		Describe the spread of gastric carcinoma.	C 1	DK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.24	KS	K	Acute appendicitis	Define the term “Acute appendicitis”	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 10.25	KS	KH		Describe the etio-pathogenesis of acute appendicitis	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ MCQ Viva	Practice of medicine, Surgery

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 10.26	KS	KH		Describe the morphology of Acute appendicitis	C2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ MCQ Viva	
HOMUG-Path M. 10.27	KS	KH	Inflammatory bowel disease	Describe the aetio-pathogenesis of Inflammatory bowel disease	C 2	MK	Lecture	Viva SAQ MCQ	SAQ, MCQ, Viva	Practice of medicine, Surgery
HOMUG-Path M. 10.28	KS	K		Describe the morphologic features of Crohn's disease	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva voce	
HOMUG-Path M. 10.29	KS	K		Describe the morphologic features of Ulcerative colitis	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.30	KS	K	Inflammatory bowel disease	Enumerate the differences between Crohn's disease and Ulcerative Colitis.	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.31	KS	K		Discuss the complications of Inflammatory bowel disease	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.32	KS	K	Carcinoma Colon	Describe the aetiology of Colorectal cancer	C 1	DK	Lecture	Viva MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine, Surgery

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 10.33	KS	K		Describe the morphology of Colorectal cancer	C 1	DK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.34	KS	K		Describe the spread of Colorectal cancer	C 1	DK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 10.35	KS	K	Intestinal tuberculosis	Describe the pathology of Intestinal tuberculosis	C 1	DK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	

#### 5.11. Diseases of liver, gall bladder and biliary ducts-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 11.1	KS	K	Liver Function Tests	Discuss the liver function tests alongwith clinical significance of each	C 1	MK	Lecture	OSPE Viva MCQ	OSPEL AQ SAQ MCQ Viva	
HOMUG-Path M. 11.2	KS	K	Jaundice	Define the term “Jaundice”	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 11.3	KS	K		State the pathophysiologic classification of jaundice.	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 11.4	KS	K	Cholestasis	Define Cholestasis	C 1	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 11.5	KS	K	Alcoholic Liver Disease	Define the term “Alcoholic liver disease”	C 1	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 11.6	KS	K		Explain the pathogenesis of alcoholic liver disease	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	
HOMUG-Path M. 11.7	KS	K		Describe the morphologic spectrum of alcoholic liver disease	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HOMUG-Path M. 11.8	KS	K	Liver Cirrhosis	Define the term “Liver cirrhosis”	C 1	MK	Lecture	Viva voce, MCQ	LAQ SAQ, MCQ Viva	
HOMUG-Path M. 11.9	KS	K	Liver Cirrhosis	Classify Cirrhosis based on morphology and aetiology	C 1	DK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ Viva	Practice of medicine
HOMUG-Path M. 11.10	KS	KH		Describe the morphology of Alcoholic cirrhosis	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ Viva	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 11.11	KS	K	Hepatocellular Carcinomas	State the aetiology of Hepatocellular Carcinomas	C 1	DK	Lecture	Viva SAQ MCQ	Viva SAQ MCQ	
HOMUG-Path M. 11.12	KS	K		Describe the morphology of hepatocellular carcinoma.	C 1	DK	Lecture	Viva SAQ MCQ	Viva SAQ MCQ	Practice of medicine, Surgery
HOMUG-Path M. 11.13	KS	K	Cholelithiasis.	State the risk factors of cholelithiasis.	C 1	MK	Lecture	Viva SAQ MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 11.14	KS	KH		Describe the pathogenesis of cholelithiasis/ gall stones	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine, Surgery
HOMUG-Path M. 11.15	KS	K		Describe the various types of gall stones	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	

### 5.12. Diseases of the pancreas-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 12.1	KS	K	Acute Pancreatitis	Define the term “Acute pancreatitis”	C 1	MK	Lecture	Viva MCQ	MCQ, Viva	
HOMUG-Path M. 12.2	KS	KH		Describe the aetio-pathogenesis of acute pancreatitis	C 2	MK	Lecture	Viva MCQ	MCQ, Viva	Practice of medicine, Surgery

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 12.3	KS	K		State the morphologic features of acute pancreatitis.	C 1	MK	Lecture	Viva voce, SAQ MCQ	MCQ, Viva voce	
HOMUG-Path M. 12.4	KS	K	Chronic Pancreatitis	Define the term “Chronic pancreatitis”	C 1	DK	Lecture	Viva voce, MCQ	MCQ, Viva	
HOMUG-Path M. 12.5	KS	KH		Describe the aetio-pathogenesis of chronic Pancreatitis	C 2	DK	Lecture	Viva voce, SAQ MCQ	MCQ, Viva voce	Practice of medicine, Surgery
HOMUG-Path M. 12.6	KS	K		State the morphologic features of Chronic Pancreatitis.	C 1	DK	Lecture	Viva voce, SAQ MCQ	MCQ, Viva	
HOMUG-Path M. 12.7	KS	K	Diabetes mellitus	Define the term “Diabetes mellitus”	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 12.8	KS	K		Enumerate the aetiologic classification of diabetes mellitus	C 1	DK	Lecture	Viva SAQ MCQ	MCQ Viva SAQ	
HOMUG-Path M. 12.9	KS	K		Describe the pathogenesis of Type1 diabetes mellitus	C 1	DK	Lecture	Viva MCQ SAQ	MCQ Viva SAQ	Practice of medicine
HOMUG-Path M. 12.10	KS	K		Describe the pathogenesis of Type 2 diabetes mellitus	C 1	DK	Lecture	Viva MCQ SAQ	MCQ Viva SAQ	Practice of medicine
HOMUG-Path M. 12.11	KS	K		Discuss the laboratory diagnosis of Diabetes Mellitus	C 1	MK	Lecture	Viva MCQ SAQ	LAQ MCQ Viva	Practice of medicine

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
									SAQ	
HOMUG-Path M. 12.12	KS	K		Describe the Acute metabolic complications of diabetes mellitus	C 1	MK	Lecture	Viva MCQ SAQ	LAQ MCQ Viva SAQ	Practice of medicine
HOMUG-Path M. 12.13	KS	K		Describe the Late systemic complications of diabetes mellitus	C 1	MK	Lecture	Viva MCQ SAQ	LAQ MCQ Viva SAQ	

### 5.13. Diseases of blood vessels and lymphatics-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 13.1	KS	K	Arteriosclerosis	Define Arteriosclerosis	C 1	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 13.2	KS	K		State the types of Arteriosclerosis	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 13.3	KS	K	Atherosclerosis	Define the term "Atherosclerosis"	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 13.4	KS	KH		Describe the aetiology of Atherosclerosis	C 2	MK	Lecture	Viva MCQ SAQ	LAQ SAQ MCQ Viva	Practice of medicine

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 13.5	KS	KH	Atherosclerosis  Hypertension.	Describe the pathogenesis of Atherosclerosis	C 2	MK	Lecture	Viva MCQ SAQ	LAQ SAQ MCQ Viva	
HOMUG-Path M.13.6	KS	K		Describe the morphologic features of Atherosclerosis	C 1	MK	Lecture	Viva MCQ SAQ LAQ	LAQ SAQ, MCQ, Viva	
HOMUG-PathM.13.7	KS	K		Define the term “Hypertension”	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	Practice of medicine
HOMUG-Path M. 13.8	KS	K		Enumerate the aetiologic classification of Hypertension	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HOMUG-Path M. 13.9	KS	KH		Describe the aetio-of pathogenesis of Primary/essential Hypertension	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HOMUG-Path M. 13.10	KS	KH		Describe the aetio-pathogenesis of Secondary Hypertension	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ, MCQ, Viva voce	
HOMUG-Path M. 13.11	KS	KH		State the major effects of systemic hypertension on the organs	C 2	MK	Lecture	Viva voce, SAQ MCQ	LAQ SAQ, MCQ, Viva voce	



Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 13.12	KS	K	Aneurysm	Define the term “Aneurysm”	C 1	DK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 13.13	KS	K		Classify Aneurysm	C 1	DK	Lecture	Viva voce, MCQ, SAQ	LAQ, SAQ, MCQ, Viva voce	
HOMUG-Path M. 13.14	KS	KH	Aneurysm	Describe the clinical effects of aneurysms	C 2	DK	Lecture	Viva voce, MCQ, SAQ	LAQ, SAQ, MCQ, Viva voce	
HOMUG-Path M. 13.15	KS	K	Tumors of blood vessels	State the benign tumours of blood vessels	C 1	NK	Lecture	Viva voce, MCQ	NA	
HOMUG-Path M. 13.16	KS	K		State the malignant tumours of blood vessels	C 1	NK	Lecture	Viva voce, MCQ	NA	
HOMUG-Path M. 13.17	KS	K		Define the term “Lymphangitis”	C 1	NK	Lecture	Viva voce, MCQ	Viva MCQ	

#### 5.14. Diseases of cardiovascular system-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M. 14.1	KS	K	Ischaemic Heart Disease	Define the term “Ischaemic Heart Disease”	C 1	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HomUG-Path M. 14.2	KS	KH		Describe the etio-pathogenesis of Ischaemic Heart Disease	C 2	MK	Lecture	Viva MCQ SAQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HomUG-Path M. 14.3	KS	K		State the effects of Myocardial ischaemia	C 1	MK	Lecture	Viva MCQ SAQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HomUG-Path M. 14.4	KS	K	Angina Pectoris	Define the term “Angina Pectoris”	C 1	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva	
HomUG-Path M. 14.5	KS	K		Describe Stable or Typical angina	C 1	MK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva voce	
HomUG-Path M. 14.6	KS	K		Explain Prinzmetal’s variant Angina	C 1	MK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva voce	
HomUG-Path M. 14.7	KS	K		Describe Unstable or Crescendo angina.	C 1	MK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva voce	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M. 14.8	KS	KH	Myocardial Infarction.	Describe the aetio-pathogenesis of Myocardial Infarction.	C 2	MK	Lecture	Viva voce, MCQ, SAQ	LAQ, SAQ, MCQ, Viva voce	Practice of medicine
HomUG-Path M. 14.9	KS	KH		Describe the gross changes in Myocardial infarction	C 2	DK	Lecture	Viva SAQ, MCQ	LAQ, SAQ, MCQ, Viva	
HomUG-Path M. 14.10	KS	KH		Describe the microscopic changes in Myocardial infarction	C 2	DK	Lecture	Viva SAQ, MCQ	LAQ, SAQ, MCQ, Viva	
HomUG-Path M. 14.11	KS	KH		Describe the diagnosis of Myocardial Infarction.	C 2	MK	Lecture	Viva voce, MCQ, SAQ	LAQ, SAQ, MCQ, Viva voce	Practice of medicine
HomUG-Path M. 14.12	KS	K	Rheumatic heartdisease.	Define the terms “Rheumatic fever”, “Rheumatic heart disease”	C 1	MK	Lecture	Viva voce, MCQ	MCQ, Viva voce	
HomUG-Path M. 14.13	KS	KH		Describe etio-pathogenesis of Rheumatic heart disease.	C 2	MK	Lecture	Viva voce, MCQ, SAQ	LAQ, SAQ, MCQ, Viva voce	Practice of medicine
HomUG-Path M. 14.14	KS	K		Describe the Cardiac lesions of Rheumatic heart disease	C 1	MK	Lecture	Viva voce, MCQ, SAQ	LAQ, SAQ, MCQ, Viva voce	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M. 14.15	KS	K	Rheumatic heart disease.	Describe the extra-cardiac lesions in Rheumatic heart disease.	C 1	MK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva voce	
HomUG-Path M. 14.16	KS	K		Enumerate the diagnostic criterion of Rheumatic heartdisease.	C 1	MK	Lecture	Viva voce, MCQ SAQ	LAQS AQ, MCQ, Viva voce	
HomUG-Path M. 14.17	KS	K	Infective Endocarditis	Define the term “Infective endocarditis”	C 1	DK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HomUG-Path M. 14.18	KS	KH	Infective Endocarditis	Describe the aetio-pathogenesis of Infective Endocarditis	C 2	DK	Lecture	Viva MCQ SAQ	SAQ, MCQ, Viva	Practice of medicine
HomUG-Path M. 14.19	KS	K		Describe the morphologic changes of Infective Endocarditis	C 1	NK	Lecture	Viva MCQ SAQ	NA	
HomUG-Path M. 14.20	KS	K		Enumerate the Duke criteria for diagnosis of Infective endocarditis	C 1	NK	Lecture	Viva MCQ SAQ	NA	
HomUG-Path M. 14.21	KS	KH		Define the term “Pericardial effusion”	C 2	MK	Lecture	Viva MCQ	MCQ, Viva	
HomUG-Path . 14.22	KS	KH		Define the term “Pericarditis”	C 2	MK	Lecture	Viva MCQ	MCQ, Viva	Practice of medicine

### 5.15. Diseases of kidney and lower urinary tract-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 15.1	KS	K	Renal function tests	Discuss renal function tests in detail	C 1	MK	Lecture	Viva MC Q	OSPE LAQ SAQ MCQ Viva voce	Practice of medicine
HOMUG-Path M. 15.2	KS	K	Glomerular disease	Define the term “Glomerulonephritis” “Nephrotic syndrome” “Acute nephritic syndrome”	C 1	MK	Lecture	Viva MC Q SAQ	MCQ Viva SAQ	
HOMUG-Path M. 15.3	KS	K	Acute nephritic syndrome.	Enumerate the aetiology of Acute nephritic syndrome	C 1	DK	Lecture	Viva voce , MC Q SAQ	LAQ SAQ, MCQ, Viva voce	
HOMUG-Path M. 15.4	KS	KH	Acute nephritic syndrome.	Describe the clinical features of Acute nephritic syndrome.	C 2	DK	Lecture	Viva voce , MC Q SAQ	LAQ SAQ, MCQ, Viva voce	Practice of medicine
HOMUG-Path M. 15.5	KS	K	Nephrotic syndrome	Enumerate the causes of Nephrotic syndrome	C 1	DK	Lecture	Viva MC Q SAQ	LAQ SAQ, MCQ, Viva	Practice of medicine

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 15.6	KS	K		Describe the characteristic features of Nephrotic syndrome	C 1	DK	Lecture	Viva MCQ SAQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HOMUG-Path M. 15.7	KS	KH		Enumerate the differences between Nephrotic syndrome and Acute Nephritic syndrome	C 2	MK	Lecture	Viva voce, MCQ SAQ	LAQ SAQ, MCQ, Viva voce	
HOMUG-Path M. 15.8	KS	K	Glomerulonephritis	Define Glomerulonephritis	C 1	DK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 15.9	KS	KH	Acute Post-Streptococcal Glomerulonephritis	Describe the aetio-pathogenesis of Acute post-streptococcal glomerulonephritis.	C 2	MK	Lecture	Viva MCQ SAQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HOMUG-Path M. 15.10	KS	K	Nephrolithiasis	State the types of Renal calculi	C 1	MK	Lecture	Viva voce, MCQ SAQ	LAQ SAQ, MCQ, Viva voce	
HOMUG-Path M.15.11	KS	K	Nephrolithiasis	Describe the etio-pathogenesis of each type of renal stones	C 1	MK	Lecture	Viva MCQ SAQ	LAQ SAQ, MCQ, Viva	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M.15.12	KS	K		Describe the morphology of each type of renal stones	C 1	MK	Lecture	Viva SAQ MCQ	LAQ SAQ MCQ Viva	
HOMUG-Path M.15.13	KS	K	Urinary tract infections	Define the term “Acute pyelonephritis” “ureteritis”, “Cystitis”, “Urethritis”	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M.15.14	KS	K	Renal Cell Carcinoma	Discuss the etiology of Renal Cell Carcinoma	C 1	DK	Lecture	Viva voce , MCQ SAQ	SAQ, MCQ, Viva voce	Practice of medicine, Surgery
HOMUG-Path M.15.15	KS	K		Describe the morphology of Renal Cell Carcinoma	C 1	DK	Lecture	Viva voce , MCQ SAQ	SAQ, MCQ, Viva voce	
HOMUG-Path M.15.16	KS	K	Wilm’s tumour	Describe the morphology of Wilm’s tumour	C 1	NK	Lecture	Viva voce , MCQ SAQ	NA	Practice of medicine, Surgery

### 5.16. Diseases of male reproductive system-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 16.1	KS	K	Inflammatory diseases	Define the terms “Orchitis”, “Epididymitis”	C 1	MK	Lecture	Viva MCQ	SAQ, MCQ, Viva	
HOMUG-Path M. 16.2	KS	K	Testicular Tumors	Classify testicular tumors	C 1	DK	Lecture	Viva MCQ SAQ	SAQ, MCQ Viva	Practice of medicine, Surgery
HOMUG-Path M. 16.3	KS	K		Discuss the morphology of Germ cell tumors	C 1	DK	Lecture	Viva MCQ SAQ	SAQ, MCQ Viva	
HOMUG-Path M. 16.4	KS	K	Inflammatory diseases	Define the term “Prostatitis”	C 1	NK	Lecture	Viva MCQ	NA	
HOMUG-Path M. 16.5	KS	K		State the types of Prostatitis	C 1	NK	Lecture	Viva MCQ	NA	Practice of medicine, Surgery
HOMUG-Path M. 16.6	KS	KH	Benign Nodular Hyperplasia Of Prostate	Describe the etio-pathogenesis of Benign nodular hyperplasia of prostate	C 2	MK	Lecture	Viva MCQ SAQ	LAQ SAQ MCQ, Viva	Practice of medicine, Surgery
HOMUG-Path M. 16.7	KS	KH		Describe the pathology of Benign nodular hyperplasia of prostate	C 2	MK	Lecture	Viva voce, MCQ SAQ	LAQ SAQ, MCQ, Viva voce	Practice of medicine, Surgery
HOMUG-Path M. 16.8	KS	K	Ca Prostate	Describe the aetiology of Carcinoma of Prostate	C 1	NK	Lecture	Viva voce, MCQ SAQ	NA	



Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 16.9	KS	KH		Describe the morphology of Carcinoma of Prostate	C 2	NK	Lecture	Viva voce, MCQ SAQ	NA	Practice of medicine, Surgery
HOMUG-Path M. 16.10	KS	KH	Ca Prostate	Explain the spread of Carcinoma of Prostate	C2	NK	Lecture	Viva MCQ SAQ	NA	

### 5.17. Diseases of the female genitalia and breast-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 17.1	KS	K	Cervicitis	Define the term “Cervicitis”	C 1	DK	Lecture	Viva MCQ	MCQ, Viva	OBG
HOMUG-Path M. 17.2	KS	K		State the types of Cervicitis	C 1	DK	Lecture	Viva MCQ	MCQ, Viva	
HOMUG-Path M. 17.3	KS	K		Define the term Endometritis.	C 1	DK	Lecture	Viva MCQ SAQ	MCQ Viva	
HOMUG-Path M. 17.4	KS	K		Define the term Endometriosis	C 1	DK	Lecture	Viva MCQ	MCQ, Viva	OBG

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 17.5	KS	KH		Define the term Leiomyomas	C 1	DK	Lecture	Viva MCQ SAQ	MCQ Viva SAQ	OBG
HOMUG-Path M. 17.6	KS	KH		Discuss the morphology of Leiomyoma uterus	C 1	DK	Lecture	Viva MCQ SAQ	MCQ Viva SAQ	OBG
HOMUG-Path M. 17.7	KS	K		Define the term ‘Adenomyosis’	C 1	DK	Lecture	Viva MCQ SAQ	MCQ Viva	OBG
HOMUG-Path M. 17.8	KS	KH	Ovarian Tumors.	Classify ovarian tumours	C 1	MK	Lecture	Viva MCQ SAQ	LAQ MCQ Viva SAQ	OBG
HOMUG-Path M. 17.9	KS	K		Discuss the morphology of germ cell tumors of ovary	C 2	MK	Lecture	Viva MCQ SAQ	LAQ MCQ Viva SAQ	OBG
HOMUG-Path M. 17.10	KS	K		Discuss the morphology of serous tumors of ovary	C 2	MK	Lecture	Viva SAQ MCQ	LAQ SAQ MCQ, Viva	OBG
HOMUG-Path M. 17.11	KS	K		Discuss the morphology of mucinous tumors of ovary	C 2	MK	Lecture	Viva MCQ	LAQ SAQ, MCQ, Viva	OBG
HOMUG-Path M. 17.12	KS	KH		Describe the pathology of Fibroadenoma breast	C 2	MK	Lecture	Viva voce, MCQ	SAQ, MCQ,	

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
								SAQ,	Viva voce	
HOMUG-Path M. 17.13	KS	K	Tumors of breast	Classify breast tumors as per WHO	C 1	MK	Lecture	Viva MCQ SAQ	LAQ MCQ Viva SAQ	Surgery
HOMUG-Path M. 17.14	KS	K		Describe the etiology of Carcinoma Breast	C 1	MK	Lecture	Viva voce, MCQ SAQ	LAQ SAQ, MCQ, Viva voce	Surgery
HOMUG-Path M. 17.15	KS	KH		Describe the morphologic features of Carcinoma Breast	C 2	MK	Lecture	Viva voce, MCQ SAQ	LAQ SAQ, MCQ, Viva voce	

### 5.18. Diseases of the skin and soft tissue-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 18.1	KS	K	Tumors of skin	State the predisposing conditions of Squamous cell carcinoma	C 1	DK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva	
HOMUG-Path M. 18.2	KS	KH		Describe the pathology of squamous cell carcinoma of skin	C 2	DK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva voce	
HOMUG-Path M. 18.3	KS	K		State the pre-disposing factors for basal cell carcinoma (Rodent ulcer)	C 1	NK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva voce	
HOMUG-Path M. 18.4	KS	KH		Describe morphologic features of basal cell carcinoma of skin	C 2	NK	Lecture	Viva voce, MCQ SAQ	SAQ, MCQ, Viva voce	Practice of medicine, Surgery
HOMUG-Path M. 18.5	KS	KH	Soft tissue tumors	Describe morphologic features of lipoma.	C 2	MK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva voce	

### 5.19. Diseases of the musculo-skeletal system-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 19.1	KS	K	Bone tumors	Classify bone tumors	C 1	DK	Lecture	Viva voce, MCQ	SAQ, MCQ, Viva voce	
HOMUG-Path M. 19.2	KS	K	Bone tumors	Discuss morphology of osteosarcoma	C 1	MK	Lecture	Viva voce, MCQ	LAQ SAQ, MCQ, Viva voce	Practice of medicine
HOMUG-Path M. 19.3	KS	K	Osteo arthritis	Define Osteo Arthritis	C 1	MK	Lecture	Viva voce, MCQ	MCQ, Viva voce	Practice of medicine
HOMUG-Path M. 19.4	KS	K	Rheumatoid arthritis	Define rheumatoid arthritis	C 1	MK	Lecture	Viva voce, MCQ	MCQ, Viva voce	Practice of medicine
HOMUG-Path M. 19.5	KS	K	Gout	Define Gout	C 1	MK	Lecture	Viva voce, MCQ	MCQ, Viva voce	

### 5.20. Diseases of endocrine glands-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 20.1	KS	KH	Thyroid function tests	Interpret the abnormalities in a panel containing thyroid function tests	C 2	MK	Lecture	Viva MC Q	OSPE MCQ, Viva SAQ	
HOMUG-Path M. 20.2	KS	K	Goitre	Define the term “Goitre”	C 1	MK	Lecture	Viva MC Q	SAQ, MCQ, Viva	
HOMUG-Path M. 20.3	KS	K		Describe the etio-pathogenesis of Goitre	C 2	MK	Lecture	Viva MC Q SAQ	LAQ SAQ, MCQ, Viva	Practice of medicine
HOMUG-Path M. 20.4	KS	K		Classify Goitre on the basis of morphology	C 1	MK	Lecture	Viva voce , MC Q SAQ	LAQ SAQ, MCQ, Viva voce	Practice of medicine
HOMUG-Path M. 20.5	KS	KH	Goitre	Describe the morphology of Colloid Goitre	C 2	MK	Lecture	Viva voce , MC Q SAQ	LAQ SAQ, MCQ, Viva voce	
HOMUG-Path M. 20.6	KS	K		Describe the morphology of Multi-nodular Goitre	C 1	MK	Lecture	Viva MC Q SAQ	LAQ SAQ, MCQ, Viva	Practice of medicine

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 20.7	KS	K	Cushing syndrome	State the aetiologic types of Cushing syndrome	C 1	DK	Lecture	Viva MC Q	MCQ, Viva	Practice of medicine
HOMUG-Path M. 20.8	KS	K		Describe the clinical features of Cushing syndrome	C 1	DK	Lecture	Viva MC Q SAQ	SAQ MCQ, Viva	
HOMUG-Path M. 20.9	KS	K	Gigantism	Describe the features of Gigantism	C 1	DK	Lecture	Viva MC Q SAQ	SAQ, MCQ, Viva	
HOMUG-Path M. 20.10	KS	K	Acromegaly	Describe the features of Acromegaly	C 1	DK	Lecture	Viva MC Q SAQ	SAQ, MCQ, Viva	
HOMUG-Path M. 20.11	KS	K	Diabetes Insipidus	Describe the features of Diabetes Insipidus	C 1	DK	Lecture	Viva MC Q SAQ	SAQ, MCQ, Viva	
HOMUG-Path M. 20.12	KS	K	differences between Diabetes Mellitus and Diabetes Insipidus	Discuss differences between Diabetes Mellitus and Diabetes Insipidus	C 1	DK	Lecture	Viva MC Q SAQ	SAQ, MCQ, Viva	

### 5.21. Diseases of the nervous system-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HOMUG-Path M. 21.1	KS	K,	Meningitis	Define the term 'Meningitis'	C 1	DK	Lecture	Viva MCQ	MCQ, Viva	
HOMUG-Path M. 21.2	KS	KH		Enumerate the CSF findings in Bacterial meningitis	C 1	DK	Lecture	Viva MCQ SAQ	SAQ, MCQ, Viva	
HOMUG-Path M. 21.3	KS	KH		Enumerate the CSF findings in Tubercular meningitis	C 1	DK	Lecture	Viva MCQ SAQ	SAQ, MCQ, Viva	
HOMUG-Path M. 21.4	KS	KH		Enumerate the CSF findings in Viral meningitis	C 1	DK	Lecture	Viva MCQ SAQ	SAQ, MCQ, Viva	
HOMUG-Path M. 21.5	KS	K	CNS tumors	Classify CNS tumours	C 1	NK	Lecture	Viva MCQ	NA	



### 5.22. Introduction to Microbiology-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M. 22.1	KS	K	Basic definitions	Define the terms “Microbiology”, “Medical Microbiology” “Clinical Microbiology”.	C1	NK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 22.2	KS	K	Contributions of important scientists to Microbiology	List the contribution of important scientists to Microbiology	C1	NK	Lecture	Viva Voce	NA	
HomUG-Path M 22.3	KS	K	Koch’s postulate	State the Koch’s postulate	C1	MK	Lecture	Viva voce MCQ	SAQ Viva voce MCQ	
HomUG-Path M 22.4	KS	K	Normal Human microbiota	List the anatomical location of normal bacterial flora in the human body	C1	MK	Lecture	MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M. 22.5	KS	KH	Role of normal human microbiota	Explain the role of human microbiota in health and disease.	C2	MK	Lecture	MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 22.6	KS	KH	Role of probiotics	Explain the role of probiotics.	C2	MK	Lecture	MCQ Viva voce	MCQ Viva voce	

### 5.23. Bacterial structure, growth and nutrition-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG -Path M 23.1	KS	K	Morphology of bacteria	Explain the morphological characteristics of bacteria	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG -Path M 23.2	KS	K	Classificatio n of bacteria	Classify bacteria based on shape	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG -Path M 23.3	KS	KH	Bacterial Cell structure	Describe the detailed structure of the bacterial cell envelope	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG -Path M. 23.4	KS	K	Cell wall appendages	Define flagella	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG -Path M. 23.5	KS	KH		Describe the types of flagellar arrangement in a bacterial cell	C2	MK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG -Path M. 23.6	KS	KH	Bacterial spore	Describe the structure of bacterial spore	C2	DK	Lecture	Viva voce MCQ SAQ	Viva voce MCQ SAQ	
HomUG -Path M. 23.7	KS	KH		Describe the types of bacterial spores based on shape, position of spores	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	

HomUG -Path M. 23.8	KS	KH	Bacterial growth and nutrition	Describe bacterial growth curve	C2	DK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG -Path M 23.9	KS	KH		Describe the classification of bacteria based on energy requirements	C2	DK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG -Path M. 23.10	KS	KH		Describe the classification of bacteria based on oxygen requirements	C2	DK	Lecture	Viva voce MCQ	SAQViva voce MCQ	
HomUG -Path M. 23.11	KS	KH		Describe the classification of bacteria based on temperature requirements	C2	DK	Lecture	Viva voce MCQ	Viva voce MCQ	

#### 5.24. Sterilization and disinfection-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG- Path M 24.1	KS	K	Definitions	Define 'Sterilization', "Disinfection", "Asepsis", "Decontamination", "Bactericidal agents", "Bacteriostatic agents"	C1	MK	Lecture	Viva voce MCQ	SAQ Viva voce MCQ	
HomUG- Path M 24.2	KS	K	Methods of sterilization	Describe the various methods of sterilization	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG- Path M 24.3	KS	KH	Physical methods of sterilization	Describe the various physical methods of sterilization	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	

HomUG-Path M 24.4	KS	KH		Describe the procedure of sterilization using hot air oven	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 24.5	KS	KH		Describe the procedure of sterilization using Autoclave	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 24.6	KS	KH		Explain the uses of Pasteurization in the process of sterilization	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 24.7	KS	KH	Chemical methods of sterilization	Discuss on various types of chemical agents of sterilization	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Community medicine
HomUG-Path M 24.8	KS	K		State the characteristics of disinfectant	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Community medicine

### 5.25. Staining, culture medias and methods-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 25.1	KS	K	Staining methods	Discuss the various staining methods of bacteria	C1	MK	Lecture	MCQ Viva voce	MCQ Viva Voce SAQ	
HomUG-Path M 25.2	KS	KH		Discuss the steps of gram staining	C2	MK	Lecture	MCQ Viva voce	MCQ Viva Voce SAQ	
HomUG-Path M 25.3	KS	KH	Classification of bacteria	Classify bacteria based on gram staining property	C1	MK	Lecture	MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 25.4	KS	K	Staining methods	Discuss differences between gram positive and gram negative bacteria	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 25.5	KS	K	Staining methods	Discuss the steps of Acid fast staining	C1	MK	Lecture	SAQ MCQ Viva voce	MCQ Viva Voce SAQ	
HomUG-Path M 25.6	KS	K	Culture media	Describe types of culture media based on consistency with examples	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 25.7	KS	K		Describe culture media based on constituents with examples	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 25.8	KS	K		Describe culture media based on functional requirement with examples	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	

								Viva voce	Viva voce	
HomUG-Path M 25.9	KS	K	Culture methods	Enumerate various methods used for culturing bacteria.	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 25.10	KS	K		Describe various anaerobic culture methods	C2	DK	Lecture	Not to be assessed	SAQ MCQ Viva voce	

### 5.26. Infection and disease-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 26.1	KS	K	Infection and Disease	Define the terms” infection” pathogen, pathogenesis, pathogenicity, Virulence”, infectious disease	C1	MK	Lecture	Viva voce MCQ	SAQ Viva voce MCQ	
HomUG-Path M 26.2	KS	KH		Describe the various types of infections	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 26.3	KS	KH		Describe the sources of infection	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 26.4	KS	KH		Describe the methods of transmission of infection	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	

HomUG-Path M 26.5	KS	K	Virulence of micro-organisms	State the factors influencing virulence of micro-organisms.	C1	MK	Lecture	Viva voce MCQ	LAQ SAQ Viva voce MCQ	
HomUG-Path M 26.6	KS	KH	Exotoxins and Endotoxins	Describe the features of exotoxins	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 26.7	KS	KH		Describe the features of Endotoxins	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 26.8	KS	KH		Differentiate the features of Exotoxins and Endotoxins	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 26.9	KS	K	Classification of infectious diseases	Describe the classification of infectious diseases	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 26.10	KS	K	Nosocomial infection	Define nosocomial infection	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 26.11	KS	K		Discuss some common nosocomial infections.	C1	MK	Lecture	SAQ MCQ	MCQ VIVA	

### 5.27. Gram positive bacterias-

Sl. No.	Domains of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 27.1	KS	K	Staphylococci	Explain the morphology of Staphylococci	C1	MK	Lecture	Viva voce MCQ	SAQ Viva voce MCQ	
HomUG-Path M 27.2	KS	K		List the virulence factors of Staphylococcus aureus	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva	
HomUG-Path M 27.3	KS	KH		Explain the pathogenesis of staphylococcus aureus infections	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 27.4	KS	KH		Describe the laboratory diagnosis of staphylococcal infections	C2	DK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Practice of medicine
HomUG-Path M 27.5	KS	K	Pneumococci	Explain the morphology of Pneumococci	C1	MK	Lecture	Viva voce MCQ	SAQ MCQ Viva voce	
HomUG-Path M 27.6	KS	KH		Describe the virulence factors of Pneumococci	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.7	KS	KH		Describe the pathogenesis of Pneumococcus	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 27.8	KS	KH		Describe the laboratory diagnosis of Pneumococcal infections	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	



HomUG-Path M 27.9	KS	K	Streptococci	Explain the morphology of Streptococcus pyogenes	C1	MK	Lecture	Viva voce MCQ SAQ	SAQ MCQ Viva voce	
HomUG-Path M 27.10	KS	KH		Describe the virulence factors of Streptococcus pyogenes	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.11	KS	KH		Explain the pathogenicity of Streptococcus pyogenes	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 27.12	KS	KH		Explain the pathogenesis of post streptococcal sequelae caused by streptococcus pyogenes	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 27.13	KS	KH		Describe the laboratory diagnosis of streptococcal infections	C2	DK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ	
HomUG-Path M 27.14	KS	K	Corynebacterium diphtheriae	Explain the morphology of Corynebacterium diphtheriae	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.15	KS	KH		Describe the pathogenicity of Corynebacterium diphtheriae	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 27.16	KS	K		Describe the laboratory diagnosis of diphtheria	C1	NK	Lecture	NA	NA	Practice of medicine

HomUG-Path M 27.17	KS	K	Bacillus anthracis	Explain the morphology of Bacillus anthracis	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.18	KS	KH		Describe the pathogenicity of Bacillus anthracis	C2	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 27.19	KS	KH		Describe the clinical features of Human anthrax	C2	DK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.20	KS	KH		Describe the laboratory diagnosis of Human anthrax	C2	NK	Lecture	Not to be assessed	NA	
HomUG-Path M 27.21	KS	K	Bacillus cereus	Discuss the clinical manifestations of Bacillus cereus	C1	DK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 27.22	KS	K	Clostridium tetani	Explain the morphology of Clostridium tetani	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.23	KS	KH		Describe pathogenesis of Clostridium tetani	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva	
HomUG-Path M 27.24	KS	KH		Explain the Clinical manifestation of tetanus	C2	DK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva	Community medicine, Practice of medicine

HomUG-Path M 27.25	KS	K		Describe the Laboratory diagnosis of tetanus	C1	NK	Lecture	NA	NA	
HomUG-Path M 27.26	KS	K	Clostridium perfringens	Explain the morphology of Clostridium perfringens	C1	MK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 27.27	KS	KH		Describe the clinical manifestation of Clostridium perfringens	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.28	KS	K		Describe laboratory diagnosis of Clostridium perfringens	C1	NK	Lecture	NA	NA	
HomUG-Path M 27.29	KS	K	Clostridium botulinum	Explain the morphology of Clostridium botulinum	C1	MK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 27.30	KS	KH		Describe pathogenicity of Clostridium botulinum	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 27.31	KS	K		Describe laboratory diagnosis of Clostridium botulinum	C1	NK	Lecture	NA	NA	
HomUG-Path M 27.32	KS	KH	Clostridium Difficile	Describe the pathogenicity of Clostridium difficile	C2	NK	Lecture	NA	NA	

### 5.28. Gram negative bacterias-

Sl.No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 28.1	KS	K	Neisseria gonorrhoeae	Explain the morphology of Neisseria gonorrhoeae	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 28.2	KS	KH		Describe the pathogenesis of Neisseria gonorrhoeae	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 28.3	KS	K		Describe the laboratory diagnosis of Neisseria gonorrhoeae	C1	NK	Lecture	NA		
HomUG-Path M 28.4	KS	K	Neisseria meningitidis	Explain the morphology of Neisseria meningitidis	C1	MK	Lecture	Viva voce MCQ	SAQ Viva voce MCQ	
HomUG-Path M 28.5	KS	KH		Describe the clinical spectrum of meningococcal infections	C2	MK	Lecture	SAQ Viva voce MCQ	SAQ Viva voce MCQ	
HomUG-Path M 28.6	KS	K		Describe the laboratory diagnosis of Neisseria meningitidis	C1	NK	Lecture	NA		
HomUG-Path M 28.7	KS	K	Escherichia coli	Explain the morphology of Escherichia coli	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 28.8	KS	KH		Describe the virulence factors of Escherichia coli	C2	MK	Lecture	SAQ MCQ	MCQ Viva Voce	

HomUG-Path M 28.9	KS	KH		Describe the pathogenicity of Escherichia coli	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 28.10	KS	KH		Describe the clinical syndromes caused by Escherichia coli	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 28.11	KS	KH		Describe the laboratory diagnosis of Escherichia coli	C2	MK	Lecture	Viva voce MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 28.12	KS	KH	Shigella	Describe the pathogenicity of Shigella	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 28.13	KS	KH		Describe the clinical manifestations of Shigellosis.	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 28.14	KS	K		Describe the laboratory diagnosis of Shigellosis.	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 28.15	KS	K	Salmonellae	Explain the morphology of Salmonellae	C1	MK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 28.16	KS	KH		Describe the antigenic structure of Salmonellae	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	

HomUG-Path M 28.17	KS	KH		State the clinical syndromes caused by Salmonellae in humans	C2	MK	Lecture	Viva voce MCQ	Viva voce MCQ SAQ LAQ	Community medicine Practice of medicine
HomUG-Path M 28.18	KS	KH		Describe the pathogenesis and clinical manifestations of Enteric fever	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 28.19	KS	KH		Explain the laboratory diagnosis of Salmonella infection	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	Practice of medicine
HomUG-Path M 28.20	KS	K	Klebsiella	Describe the morphology of Klebsiella pneumonia	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 28.21	KS	KH		Describe the pathogenicity of Klebsiella pneumoniae	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 28.22	KS	K		Describe the laboratory diagnosis of Klebsiella pneumoniae	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 28.23	KS	KH	Proteus	Describe the pathogenicity of Proteus bacilli	C2	NK	Lecture	Not to be assessed		
HomUG-Path M 28.24	KS	KH	Yersinia	Describe the pathogenicity of Yersinia pestis	C2	NK	Lecture			
HomUG-Path M 28.25	KS	K	Vibrio cholera	Explain the morphology of Vibrio cholera	C1	MK	Lecture	Viva voce MCQ	MCQ Viva voce	

HomUG-Path M 28.26	KS	KH		Describe pathogenesis and clinical features of cholera	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Community medicine, Practice of medicine
HomUG-Path M 28.27	KS	KH		Describe the laboratory diagnosis of Cholera	C1	DK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 28.28	KS	KH	Pseudomonas	Describe the pathogenicity of pseudomonas aeruginosa	C1	NK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 28.29	KS	K	H.influenzae	State the diseases caused by H.influenzae	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 28.30	KS	K		Describe the laboratory diagnosis of H.influenzae	C1	NK	Lecture	Not to be assessed		
HomUG-Path M 28.31	KS	K	Bordetella pertussis	Explain the morphology of Bordetella pertussis	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 28.32	KS	KH		Describe the clinical manifestation of B.pertussis	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	Community medicine Practice of medicine
HomUG-Path M 28.33	KS	K		Describe the laboratory diagnosis of Bordetella Pertussis	C1	DK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	

HomUG-Path M 28.34	KS	K	Brucella	Explain the morphology of Brucellae	C1	DK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 28.35	KS	KH		Describe the pathogenesis of Brucellosis.	C2	DK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 28.36	KS	K		Describe the laboratory diagnosis of Brucellae	C1	NK	Lecture	NA	NA	
HomUG-Path M 28.37	KS	K	Helicobacter pylori	Describe the morphology of Helicobacter pylori	C1	NK	Lecture	NA	NA	
HomUG-Path M 28.38	KS	KH		Describe the pathogenicity of Helicobacter pylori infection	C2	DK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 28.39	KS	K		Describe the laboratory diagnosis of Helicobacter pylori infection	C1	NK	Lecture	NA	NA	
HomUG-Path M 28.40	KS	K	Rickettsiae	Discuss the human diseases caused by Rickettsiae group of organism	C1	DK	Lecture	MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 28.41	KS	K	Chlamydia	Describe the diseases caused by chlamydia	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	



### 5.29. Acid fast bacterias-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M. 29.1	KS	K	Mycobacterium tuberculosis	Explain the morphology of Mycobacterium tuberculosis	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 29.2	KS	KH		Explain the pathogenesis of Mycobacterium tuberculosis	C2	DK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Community medicine, Practice of medicine
HomUG-Path M. 29.3	KS	KH		Describe the pathology of Primary tuberculosis	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M. 29.4	KS	KH		Explain pathology of Secondary tuberculosis	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M. 29.5	KS	K		Explain laboratory diagnosis of Mycobacterial tuberculosis	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M. 29.6	KS	K	Mycobacterium leprae	Explain the morphology of Mycobacterium leprae	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 29.7	KS	KH		Discuss the pathology of Leprosy	C2	MK	Lecture	Viva voce MCQ	SAQ Viva voce	

									MCQ LAQ	
HomUG-Path M. 29.8	KS	KH		Differentiate between Lepromatous and Tuberculoid leprosy	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ LAQ Viva voce	Community medicine, Practice of medicine
HomUG-Path M. 29.9	KS	K		Describe the laboratory diagnosis of Mycobacterium Leprae	C1	DK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M. 29.10	KS	KH		Discuss Lepromin test	C2	DK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	

### 5.30. Spirochaetes

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M. 30.1	KS	K	Treponema pallidum	Explain the morphology of Treponema pallidum	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 30.2	KS	KH		Describe the pathogenesis of Syphilis	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M. 30.3	KS	KH		Describe the clinical manifestations of Syphilis	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Practice of medicine

HomUG-Path M. 30.4	KS	KH		Describe the laboratory diagnosis for syphilis	C2	DK	Lecture	SAQ MCQ Viva voce	SAQ MCQ LAQ Viva voce	
HomUG-Path M. 30.5	KS	K	Non venereal treponematoses	State the three distinct forms of non venereal trepanomatoses	C1	NK	Lecture	Not to be assessed   NA		
HomUG-Path M. 30.6	KS	K		Describe the features of Endemic syphilis	C1	NK	Lecture			
HomUG-Path M. 30.7	KS	K		Describe the features of Yaws	C1	NK	Lecture			
HomUG-Path M. 30.8	KS	K		Describe the features of Pinta	C1	NK	Lecture			
HomUG-Path M. 30.9	KS	K	Borrelia	Mention the types of Borrelia	C1	NK	Lecture	NA	NA	
HomUG-Path M. 30.10	KS	K		State the diseases caused by Borrelia	C1	NK	Lecture	NA		
HomUG-Path M. 30.11	KS	K	Leptospira	Explain the morphology of Leptospira	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 30.12	KS	KH		Describe pathogenicity of Leptospira	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	

HomUG-Path M. 30.13	KS	KH		Describe the clinical manifestations of Leptospirosis	C2	MK	Lecture	MCQViva voce	MCQVi va voce	
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### 5.31. Fungi

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M. 31.1	KS	K	Fungi	State the characteristics of fungi	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M. 31.2	KS	K		Classify fungi based on morphological forms	C1	DK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M. 31.3	KS	K		Classify fungi based on type of infection	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M. 31.4	KS	K		Discuss the laboratory diagnosis of fungal infections	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M. 31.5	KS	K		State examples for superficial mycoses	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 31.6	KS	K		State the types of Subcutaneous mycoses	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 31.7	KS	K		State four fungi causing Systemic mycoses	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 31.8	KS	K		State examples of fungi causing Opportunistic Mycoses	C1	DK	Lecture	Viva voce MCQ	Viva voce MCQ	

HomUG-Path M. 31.9	KS	KH		Describe the pathogenesis of Candidiasis	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M. 31.10	KS	KH	Homoeopathic concept	Explain the significance of susceptibility in fungal infections	C2	NK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	Organon of medicine

### 5.32. Parasitology: Introduction to Parasitology, Protozoans

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 32.1	KS	K	Introduction to parasitology	Define the terms “parasite”, “Host”	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 32.2	KS	K		State the types of parasites with examples	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 32.3	KS	K		State the types of Host with examples	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 32.4	KS	K		List the three categories of host parasite relationship	C1	MK	Lecture	Viva voce MCQ	SAQ Viva voce MCQ	
HomUG-Path M 32.5	KS	K		Define the terms Symbiosis, Commensalism, Parasitism	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 32.6	KS	K	Protozoa – Intestinal – Entamoeba histolytica	Describe the morphology of Entamoeba histolytica	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	

HomUG-Path M 32.7	KS	KH		Describe the life cycle of Entamoeba histolytica	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 32.8	KS	KH		Describe the clinical manifestations of Entamoeba histolytica	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 32.9	KS	KH		Enumerate the differences between Amoebic dysentery and Bacillary dysentery	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 32.10	KS	K		Describe the laboratory diagnosis of amoebiasis	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 32.11	KS	K	Protozoa – Intestinal - Giardia lamblia	Describe the morphology of Giardia lamblia	C1	DK	Lecture	Viva voce MCQ	SAQViva voce MCQ	
HomUG-Path M 32.12	KS	KH		Describe the life cycle of Giardia lamblia	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 32.13	KS	KH		Describe the pathogenicity and clinical features of Giardia lamblia	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 32.14	KS	K	Protozoa – Urogenital – Trichomonas vaginalis	Describe the morphology of Trichomonas vaginalis	C1	DK	Lecture	Viva voce MCQ	SAQViva voce MCQ	
HomUG-Path M 32.15	KS	KH		Describe the life cycle of Trichomonas vaginalis	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 32.16	KS	KH		Describe the pathogenesis of Trichomonas vaginalis	C2	DK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	OBG

HomUG-Path M 32.17	KS	K	Blood and Tissues – plasmodium species	Explain the life cycle of Plasmodium species	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 32.18	KS	KH		Describe the pathogenesis Plasmodium species	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 32.19	KS	KH		Describe the clinical features of malaria.	C2	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	Community medicine
HomUG-Path M 32.20	KS	K		Explain the laboratory diagnosis of malaria	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 32.21	KS	K	Blood and Tissues – Toxoplasma gondii	Describe the Mode of transmission of Toxoplasma gondii	C1	MK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 32.22	KS	KH		Describe the Pathogenesis of Toxoplasma gondii	C2	NK	Lecture			
HomUG-Path M 32.23	KS	KH		Describe the Clinical features of human toxoplasmosis	C2	DK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 32.24	KS	K		Describe the Lab diagnosis of human toxoplasmosis	C1	NK	Lecture	Not to be assessed		
HomUG-Path M 32.25	KS	K	Blood and Tissues –	Describe the Trypanosoma brucei	C1	NK	Lecture	SAQ MCQ	MCQ	

HomUG-Path M 32.26	KS	KH	Trypanosoma brucei	Describe the Life cycle of Trypanosoma brucei	C2	DK	Lecture	SAQ MCQ	MCQ	
HomUG-Path M 32.27	KS	KH		Describe the Pathogenecity of Trypanosoma brucei	C2	DK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 32.28	KS	KH		Describe the Clinical features of trypanosomiasis	C2	DK	Lecture	SAQ MCQ Viva voce	SAQMCQ Viva voce	
HomUG-Path M 32.29	KS	K		Describe the Lab diagnosis of trypanosomiasis	C1	NK	Lecture	Not to be assessed		
HomUG-Path M 32.30	KS	K	Blood and Tissues – Trypanosoma Cruzi	Describe the morphology of Trypanosoma Cruzi	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 32.31	KS	K		Describe the Life cycle of Trypanosoma Cruzi	C1	MK	Lecture	SAQ MCQ	SAQ MCQ LAQ	
HomUG-Path M 32.32	KS	KH		Describe the Pathogenicity of Trypanosoma Cruzi	C2	MK	Lecture	SAQ MCQ	SAQ MCQ LAQ	
HomUG-Path M 32.33	KS	KH		Describe the Clinical features of Chagas disease	C2	MK	Lecture	SAQ MCQ	SAQ MCQ LAQ Viva voce	Community medicine
HomUG-Path M 32.34	KS	K		Describe the Lab diagnosis of Chagas disease	C1	CK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	



HomUG-Path M 32.35	KS	K	Blood Tissues and – Leishmania species	Describe the morphology of Leishmania donovani	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 32.36	KS	KH		Describe the Life cycle of Leishmania donovani	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 32.37	KS	KH		Describe the pathogenicity of Leishmania donovani	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 32.38	KS	KH		Describe the clinical features of Leishmaniasis	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 32.39	KS	K		Describe the Laboratory diagnosis of Leishmaniasis.	C1	DK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	

### 5.33. Helminths-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 33.1	KS	K	Helminths – Cestodes – Echinococcus granulosus	Describe the morphology of Echinococcus granulosus	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva	
HomUG-Path M 33.2	KS	KH		Describe the life cycle of Echinococcus granulosus	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva	
HomUG-Path M 33.3	KS	KH		Describe the pathogenesis of Echinococcus granulosus	C2	MK	Lecture	MCQ	LAQ SAQ MCQ Viva	
HomUG-Path M 33.4	KS	KH		Describe the clinical features of hydatid disease	C2	MK	Lecture	MCQ	LAQ SAQ MCQ Viva	
HomUG-Path M 33.5	KS	K		Describe Laboratory diagnosis of hydatid disease	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva	
HomUG-Path M 33.6	KS	K	Helminths – Cestodes – Taenia saginata and Taenia solium	Describe the morphological difference between T.saginata and T.solium	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva	
HomUG-Path M 33.7	KS	KH		Describe the life cycle of Taenia saginata	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva	
HomUG-Path M 33.8	KS	KH		Describe the life cycle of Taenia solium	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva	

HomUG-Path M 33.9	KS	KH		Describe the pathogenicity and clinical features of taeniasis	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Community medicine
HomUG-Path M 33.10	KS	K		Describe the lab diagnosis of taeniasis.	C1	DK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva	
HomUG-Path M 33.11	KS	K	Helminths – Trematodes – Paragonimuswestermani	Describe the morphology of Paragonimuswestermani	C1	DK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 33.12	KS	K		Describe the life cycle of Paragonimuswestermani	C1	DK	Lecture	SAQ MCQ	MCQ	
HomUG-Path M 33.13	KS	KH		Describe the pathogenicity and clinical features of Paragonimuswestermani	C2	DK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 33.14	KS	K		Describe the lab diagnosis of paragonimiasis	C1	NK	Lecture	Not to be assessed		
HomUG-Path M 33.15	KS	K	Helminths – Trematodes – Schistosoma haematobium	Describe the morphology of Schistosoma haematobium	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 33.16	KS	KH		Describe the life cycle of Schistosoma haematobium	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 33.17	KS	KH		Describe the pathogenicity and clinical features of Bilharziasis	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 33.18	KS	K		Describe the lab diagnosis of Bilharziasis	C1	DK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	

HomUG-Path M 33.19	KS	K	Helminths – Trematodes – F.hepatica	Describe the morphology of Fasciola hepatica	C1	MK	Lecture	SAQ MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 33.20	KS	K		Describe the life cycle of Fasciola hepatica	C1	NK	Lecture	NA	NA	
HomUG-Path M 33.21	KS	KH		Describe the pathogenicity of Fascioliasis	C2	DK	Lecture	MCQ Viva voce	MCQ Viva voce	
HomUG-Path M 33.22	KS	K	Helminths – Nematodes – Ankylostoma duodenale	Describe the morphology of Ancylostoma duodenale	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.23	KS	KH		Describe the life cycle of Ancylostoma duodenale	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.24	KS	KH		Describe the pathogenicity and clinical features of hook worm infection.	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	Community medicine
HomUG-Path M 33.25	KS	K		Describe the laboratory diagnosis of hook worm infection.	C1	DK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.26	KS	K		Describe the morphology of Ascaris lumbricoides	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.27	KS	KH		Describe the life cycle of Ascaris lumbricoides	C2	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	

HomUG-Path M 33.28	KS	KH		Describe the pathogenicity and clinical features of Ascariasis	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.29	KS	K		Describe laboratory diagnosis of Ascariasis	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.30	KS	K	Helminths – Nematodes – Enterobius vermicularis	Describe the morphology of Enterobius vermicularis	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.31	KS	KH		Describe the life cycle of Enterobius vermicularis	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.32	KS	K		Describe the pathogenicity and clinical features of Enterobiasis	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.33	KS	K		Describe the laboratory diagnosis of Enterobiasis	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.34	KS	K		Describe the morphology of Strongyloidesstercoralis	C1	NK	Lecture	NA	NA	
HomUG-Path M 33.35	KS	KH	Helminths – Nematodes – Strongyloidesstercoralis	Describe the life cycle of Strongyloidesstercoralis	C1	NK	Lecture	NA	NA	
HomUG-Path M 33.36	KS	KH		List the diseases caused by S.stercoralis	C2	NK	Lecture	NA	NA	

HomUG-Path M 33.37	KS	K	Helminths – Nematodes – Trichuristrichiura	Describe the morphology of Trichuris trichiura	C1	DK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 33.38	KS	KH		Describe life cycle of Trichuris trichiura	C2	DK	Lecture	SAQ MCQ	MCQ	
HomUG-Path M 33.39	KS	KH		Describe the pathogenicity and clinical manifestation of Trichuristrichiura	C2	DK	Lecture	SAQ MCQ	MCQ	
HomUG-Path M 33.40	KS	K		Describe the lab diagnosis of trichuriasis	C1	NK	Lecture	Not to be assessed		
HomUG-Path M 33.41	KS	K	Helminths – Filarial Nematodes – Wuchereriabancrofti	Describe the morphology of Wuchereriabancrofti	C1	MK	Lecture	SAQ MCQViva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.42	KS	KH		Describe the life cycle of Wuchereriabancrofti	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 33.43	KS	KH		Describe pathogenesis of Wuchereriabancrofti	C2	MK	Lecture	SAQ MCQViva voce	LAQ SAQ MCQViva voce	
HomUG-Path M 33.44	KS	K		Describe the lab diagnosis of Wuchereriasis	C1	MK	Lecture	SAQ MCQViva voce	LAQ SAQ MCQViva voce	
HomUG-Path M 33.45	KS	KH	Helminths – Filarial Nematodes – Brugiamalayi	Describe pathogenesis of Brugiamalayi	C2	NK	Lecture	Viva voce MCQ	Viva voce MCQ	

HomUG-Path M 33.46	KS	KH	Loa Loa	Describe pathogenesis of Loa Loa	C2	NK	Lecture	NA	NA	
HomUG-Path M 33.47	KS	KH	Onchocerca volvulus	Describe pathogenesis of Onchocerca volvulus	C2	NK	Lecture	NA	NA	
HomUG-Path M 33.48	KS	KH	Dracunculus medinensis	Describe pathogenesis of Dracunculus medinensis	C2	NK	Lecture	NA	NA	
HomUG-Path M 33.49	KS	KH	Homoeopathic concepts	Explain the Homoeopathic concepts in parasitic infections	C2	DK	Lecture	SAQ MCQ	SAQ MCQ	Organon of medicine
HomUG-Path M 33.50	KS	KH		Explain the application of Homoeopathic concepts in management of parasitic infections	C2	DK	Lecture	SAQ MCQ	SAQ MCQ	Organon of medicine

### 5.34. Virology : Introduction-

Sl.No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 34.1	KS	K	Virology – Introduction - Structure	Describe the morphology of virus	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 34.2	KS	K	Virology – Introduction – Viral replication	Discuss the steps of viral replication	C1	DK	Lecture	Viva voce MCQ	SAQ Viva voce MCQ	
HomUG-Path M 34.3	KS	K	Virology – Introduction – Viral inclusion bodies	Describe the viral inclusion bodies with examples	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 34.4	KS	K	Pathogenesis of viral infections	Describe the pathogenesis of viral infections	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 34.5	KS	K	Virology – Introduction – Lab diagnosis of Viral infections	Discuss about cultivation of viruses	C1	NK	Lecture	Not to be assessed	Not to be assessed	



HomUG-Path M 34.6	KS	K	Virology – Introduction - Classification	Describe the classification of viruses based on type of nucleic acid	C1	MK	Lecture	SAQ MCQ Viva voce	LAQ SAQ MCQ Viva voce	
HomUG-Path M 34.7	KS	K	Virus host interactions and its Significance in Homoeopathy	State the various virus host interactions	C1	MK	Lecture	SAQ MCQ	MCQ Viva	
HomUG-Path M 34.8	KS	K	Bacteriophages	Explain the morphology of bacteriophage	C1	MK	Lecture	SAQ MCQ Viva voce	SAQ MCQ Viva voce	
HomUG-Path M 34.9	KS	K		Explain the significance of bacteriophages in medical microbiology	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	

### 5.35. DNA viruses-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 35.1	KS	K	DNA virus – Pox virus-	State the pox virus which infect humans	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 35.2	KS	K		Describe the clinical features of Molluscum contagiosum	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 35.3	KS	K	DNA virus – Papova virus-Human papillomavirus	Discuss the diseases caused by Human Papilloma virus	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	

HomUG-Path M 35.4	KS	KH	DNA virus –Herpes virus- Herpes simplex	Explain the pathogenesis of Herpes simplex virus	C2	MK	Lecture	SAQ MCQ	MCQ	
HomUG-Path M 35.5	KS	K		Describe the clinical features of Herpes simplex virus infection	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 35.6	KS	K		Describe the laboratory diagnosis of Herpes virus infection	C1	MK	Lecture	SAQ MCQ	MCQ	
HomUG-Path M 35.7	KS	K	DNA virus –Herpes virus- Varicella-zoster	Describe the pathogenesis of Varicella zoster	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 35.8	KS	KH		Describe the clinical manifestation and complications of Chicken pox	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 35.9	KS	KH		Describe the pathogenesis of Herpes zoster or shingles	C2	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 35.10	KS	K		Explain the laboratory diagnosis of Varicella-zoster infection	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M 35.11	KS	K	DNA virus –Herpes virus- Cytomegaloviruses	Explain the morphology of Cytomegalovirus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 35.12	KS	K		Describe the clinical features of Cytomegalovirus disease	C1	DK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 35.13	KS	K		Explain the laboratory diagnosis of Cytomegalovirus disease	C1	DK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 35.14	KS	K	DNA virus –Herpes virus- Human herpes virus	List the two variants of Human Herpes Virus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	

HomUG-Path M 35.15	KS	K		Explain the clinical features of Human Herpes virus	C1	MK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 35.16	KS	K	DNA virus –Herpes virus-Epstein –Barr virus	List the clinical conditions caused by Epstein-Barr virus	C1	MK	Lecture	Viva voce MCQ	SAQ MCQ Viva voce	
HomUG-Path M 35.17	KS	K		Describe the pathogenesis of Epstein –Barr virus infection	C1	MK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 35.18	KS	K		Describe the laboratory diagnosis of Epstein-Barr virus infection	C1	MK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 35.19	KS	KH	DNA virus – Adenoviruses	Describe the pathogenicity and clinical manifestations of Adenoviruses	C2	MK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 35.20	KS	K		Explain the laboratory diagnosis of Adenovirus disease	C1	DK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 35.21	KS	K	DNA virus –Hepadna virus – Hepatitis B virus	Explain the morphology of Hepatitis B virus	C1	MK	Lecture	SAQ MCQ	SAQ MCQ LAQ	
HomUG-Path M 35.22	KS	K		Describe the mode of transmission of Hepatitis B virus infection	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 35.23	KS	K		Describe the pathogenesis of hepatitis B virus infection	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	

HomUG-Path M 35.24	KS	K		Describe the clinical features of hepatitis B virus infection	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	Community medicine, Practice of medicine
HomUG-Path M 35.25	KS	K		Explain the laboratory diagnosis of Hepatitis B virus infection	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	

### 5.36. RNA viruses-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 36.1	KS	K	RNA virus – Orthomyxovirus-Influenza virus	Describe the morphology of Influenza virus	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 36.2	KS	KH		Describe the pathogenesis of Influenza virus	C2	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 36.3	KS	K		Describe the clinical features of Influenza virus infection	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	Community medicine, Practice of medicine
HomUG-Path M 36.4	KS	K		Explain the laboratory diagnosis of Influenza virus infection	C1	MK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 36.5	KS	K	RNA virus – Paramyxovirus-Mumps	Explain the morphology of Mumps virus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 36.6	KS	K		Describe the clinical features of mumps	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	Community medicine, Practice of medicine

HomUG-Path M 36.7	KS	K		Explain the complications of Mumps	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 36.8	KS	K		Describe the laboratory diagnosis of Mumps virus infection	C1	NK	Lecture	Not to be assessed		
HomUG-Path M 36.9	KS	K	RNA virus – Paramyxovirus-Measles	Explain the morphology of Measles virus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 36.10	KS	KH		Explain the pathogenesis of Measles	C2	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 36.11	KS	K		Describe the clinical features and complications of Measles	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	Community medicine, Practice of medicine
HomUG-Path M 36.12	KS	K		Describe the laboratory diagnosis of Measles virus	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 36.13	KS	K	RNA virus – Paramyxovirus-Rubella virus	Explain the morphology of Rubella virus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 36.14	KS	K		Describe the clinical features of Rubella virus infection	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 36.15				Describe the features of congenital Rubella syndrome	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 36.16	KS	K		Explain the laboratory diagnosis of Rubella	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M 36.17	KS	K	RNA virus – Paramyxovirus-RSV	Describe the morphology of Respiratory syncytial virus	C1	NK	Lecture	Not to be assessed		

HomUG-Path M 36.18	KS	KH		Describe the clinical features of Respiratory syncytial virus infection	C2	DK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M 36.19	KS	K	RNA virus – Corona virus	Explain the morphology of Coronavirus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 36.20	KS	K		State the types of corona virus infecting humans	C1	MK	Lecture	Viva voce MCQ	LAQ SAQ Viva voce MCQ	
HomUG-Path M 36.21	KS	K		Describe the clinical features of Corona virus disease	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ Viva voce	
HomUG-Path M 36.22	KS	K		Explain the laboratory diagnosis of Corona virus disease	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M 36.23	KS	K	RNA virus – Rhabdovirus – Rabies virus	Explain the morphology of Rabies virus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M 36.24	KS	K		Describe the mode of transmission of Rabies	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M. 36.25	KS	K		Describe the pathogenicity of Rabies	C1	MK	Lecture	SAQ MCQ	SAQ MCQ MCQ Viva voce	
HomUG-Path M. 36.26	KS	K		Describe the clinical stages of Rabies	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	Community medicine
HomUG-Path M. 36.27	KS	K		Explain the laboratory diagnosis of human rabies	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	

HomUG-Path M 36.28	KS	K	RNA virus –Picorna virus-Polio virus	Explain the morphology of Polio virus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 36.29	KS	K		Describe the pathogenesis of Polio virus infection	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M. 36.30	KS	K		Describe the clinical features of polio	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	Community medicine
HomUG-Path M 36.31	KS	K		Describe the laboratory diagnosis polio	C1	MK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG-Path M. 36.32	KS	K	RNA virus –Arboviruses –	Describe the general features of Arboviruses	C1	NK	Lecture	NA	NA	
HomUG-Path M. 36.33	KS	K		Describe the types of Dengue	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M. 36.34	KS	K		Describe the pathogenesis and clinical classification of Dengue	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	Community medicine, Practice of medicine
HomUG-Path M 36.35	KS	K		Explain the laboratory diagnosis of Dengue	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M. 36.36	KS	K	RNA virus –Arbo virus – Chikungunya virus	Describe the clinical features of Chikungunya	C1	MK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M. 36.37	KS	K		Explain the laboratory diagnosis of Chikungunya	C1	MK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M. 36.38	KS	K	RNA virus –Arbo virus – Yellow fever	Describe the clinical features of Yellow fever	C1	NK	Lecture	Not to be assessed		

HomUG-Path M.36.39	KS	K	RNA viruses – Arbo virus – Japanese encephalitis -	Describe the clinical features of Japanese encephalitis	C1	DK	Lecture	SAQ MCQ	MCQ Viva voce	
HomUG-Path M.36.40	KS	K	RNA viruses – Retro virus – HIV	Explain the morphology of Human immunodeficiency virus	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M.36.41	KS	K		State the major antigens of HIV	C1	MK	Lecture	Viva voce MCQ	LAQ SAQ Viva voce MCQ	
HomUG-Path M.36.42	KS	K		Describe the pathogenesis of HIV infection	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	
HomUG-Path M.36.43	KS	K		Describe the clinical features of HIV infection	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	Practice of medicine
HomUG-Path M.36.44	KS	KH		Describe confirmatory tests for diagnosis of HIV and AIDS	C1	MK	Lecture	SAQ MCQ	LAQ SAQ MCQ	Practice of medicine
HomUG-Path M.36.45	KS	K	RNA viruses – Hepatitis virus – HAV	Describe the morphology of Hepatitis A virus	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M.36.46	KS	K		Describe the pathogenesis of type A Hepatitis	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M.36.47	KS	K		Describe the clinical features of type A hepatitis	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	



HomUG-Path M. 36.48	KS	K		Describe the laboratory diagnosis of type A hepatitis	C1	MK	Lecture	SAQ MCQ	SAQ MCQ Viva voce	
HomUG-Path M. 36.49	KS	K	RNA viruses – Hepatitis virus –C,D,E	Discuss the comparative features of the viral hepatitis type C,D and E viruses	C1	DK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 36.50	KS	K	Emerging/re-emerging infections	Describe the factors contributing to emerging and re-emerging infectious diseases	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	
HomUG-Path M. 36.51	KS	K		State the emerging infections in India	C1	MK	Lecture	Viva voce MCQ	Viva voce MCQ	

### 5.37. Homoeopathic correlation with microbiology-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
HomUG-Path M 37.1	KS	K	Homoeopathic correlation	Discuss the correlation of study of microbiology and parasitology with homoeopathic philosophy	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	Organon of medicine
HomUG-Path M 37.2	KS	K		Discuss Homoeopathic prophylaxis	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	Organon of medicine
HomUG-Path M 37.3	KS	K		Discuss genus epidemics	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	Organon of medicine
HomUG-Path M 37.4	KS	K		Discuss the correlation of study of microbiology and parasitology with	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	Materia medica

			homoeopathic materiamedica						
HomUG- Path M 37.5	KS	K	Discuss the correlation of study of microbiology and parasitologywith Repertory	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	
HomUG- Path M 37.6	KS	K	Discuss the significance of study of microbiology and parasitologyfor homoeopathic physician	C1	DK	Lecture	SAQ MCQ	SAQ MCQ	Organon of medicine

### 5.38. Practicals and demonstration-

Sl. No.	Content	Competency/ Outcome	Entry behaviour	Specific Learning Objectives	Learner activity	Assessment
HomU G-Path M38.1	Blood grouping-A B O Grouping – Slide technique	Learner should be able to perform the blood grouping test of the blood sample	ABO blood group system RH blood group system	1.Perform estimation of blood group and Rh system using slide method 2.Interpret the results of experiment to determine the blood group and Rh grouping of blood sample.	1.Perform the procedure as per the methodology 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.2	Estimation of Haemoglobin	Learner should be able to perform the estimation of Haemoglobin with accuracy and interpret the results	Normal Haemoglobin content in children, adult males, Adult females	1. Perform estimation of Haemoglobin using Sahli's haemoglobinometer 2. Interpret of Haemoglobin concentration of the blood sample	1.Perform the procedure as per the methodology 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.3	Red Blood Cell Count	Learner should be able to perform the RBC count with accuracy and interpret the results	Normal values of RBC count in children, Adult males, Adult females	1. Perform the counting of RBC using haemocytometer 2. Calculate total RBC count of blood sample.	1.Perform the procedure as per the methodology 2.Make entries into the pathology practical record practical record	Viva voce OSPE Checklist

HomU G-Path M38.4	Total White blood cell count	Learner should be able to do the WBC count with accuracy and interpret the results	Normal values of WBC count in children, Adult males, Adult females	1. Perform the counting of WBC using haemocytometer 2. Calculate total WBC count of blood sample.	1. Perform the procedure as per the methodology 2. Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.5	Differential count and morphology	Learner should be able to perform the Differential count with accuracy and interpret the results	Normal values in percentage of each type of white blood cell. Morphology of various WBC	1. Examine the blood smear for counting of differential leucocyte count. 2. Calculate the differential leukocyte count of blood sample.	1. Perform the procedure as per the methodology 2. Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.6	Erythrocyte sedimentation rate [Demonstration]	Learner should be able to explain the significance of ESR and interpret the results	Stages of sedimentation of RBCs Normal values of ESR	1. Observe the experiment using Westergren method. 2. Interpret the value of ESR of blood sample	1. Observe the procedure 2. Make entries into the pathology practical record	NA
HomU G-Path M38.7	Erythrocyte sedimentation rate [Demonstration]	Learner should be able to describe the significance of ESR and interpret the results	Stages of sedimentation of RBCs Normal values of ESR	1. Observe the experiment using Wintrobe method. 2. Interpret the value of ESR of blood sample	1. Observe the procedure 2. Make entries into the pathology practical record	NA
HomU G-Path M38.8	Bleeding time – Duke's method	Learner should be able to perform with accuracy and reliability the bleeding time of the given sample of blood	Normal value of Bleeding time	1. Perform the experiment using Duke's method 2. Calculate the bleeding time of blood sample.	1. Perform the procedure as per the methodology 2. Make entries into the pathology practical record	Viva voce OSPE Checklist

HomU G-Path M38.9	Clotting time- fingertip method	Learner should be able to perform with accuracy and reliability the clotting time of the given sample of blood	Factors involved in blood clotting Sequence in clotting mechanism Normal value of clotting time	1. Perform the experiment using fingertip method 2. Calculate the clotting time of blood sample.	1.Perform the procedure as per the methodology 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.10	Staining of thick and thin films [Demonstration]	Learner should be able to explain the procedure of staining of thin film,	Principle and technique of preparation of Staining of thick films	Observe the procedure of staining of thin blood film	1.Observe the procedure as per the methodology 2.Make entries into the pathology practical record	NA
HomU G-Path M38.11	Staining of thick and thick films [Demonstration]	Learner should be able to explain the procedure of staining of thick film,	Principle and technique of preparation of Staining of thin films	Observe the procedure of staining of thick blood film	1.Observe the procedure as per the methodology 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.12	Platelet count [Demonstration]	Learner should be able to describe the significance of platelet count and interpret the results	Normal value of Platelet count  Principle and technique of counting of Platelet	1. Observe the experiment of counting of Platelet of blood sample 2. Calculate platelet count of blood sample	1.Observe the procedure as per the methodology 2.Make entries into the pathology practical record	NA
HomU G-Path M38.13	Urine examination: Physical examination	Learner should be able to perform physical examination of urine with logical interpretation of results	Principle and technique of Physical examination of urine  Clinical significance of physical examination of urine	1. Perform the physical examination of urine sample 2. Interpret the results	1.Perform the procedure as per the methodology 2.Make entries into the pathology practical record	Viva voce OSPE Checklist

HomU G-Path M38.14	Urine examination: Chemical examination	Learner should be able to perform chemical examination of given sample of urine with logical interpretation of results	Principle and technique of Chemical examination of urine  Clinical significance of chemical examination of urine	1. Perform the chemical examination of urine for presence of glucose, proteins, ketones, bile derivatives and blood 2. Interpret the results	1.Perform the procedure as per the methodology 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.15	Urine examination: Microscopic examination	Learner should be able to do microscopic examination of urine and interpret the results	Principle and technique of microscopic examination of urine  Clinical significance of microscopic examination of urine	1. Perform the microscopical examination of urine sample 2. Interpret the results	1.Perform the procedure as per the methodology 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38.16	Examination of Faeces:Physical [Demonstartion]	Learner should be able to describe the procedure of physical examination of faeces	Principle and technique of physical examination of faeces  Clinical significance of physical examination of faeces	1. Observe the procedure of physical examination of faeces  2. Interpret the results of Physical Examination of Faeces	1.Observe the procedure 2.Make entries into pathology practical record	NA
HomU G-Path M38.17	Examination of Faeces:Microscopic for ova and protozoa [Demonstration]	Learner should be able to describe the procedure of microscopical examination of faeces and interpret the results	Principle and technique of microscopic examination of faeces  Clinical significance of microscopic examination of faeces	1. Observe the procedure of microscopical examination of faeces for ova and protozoa  2. Interpret the results of microscopical Examination of Faeces	1.Observe the procedure 2.Make entries into pathology practical record	NA

HomU G-Path M38.18	Examination of Faeces:Chemical (occult blood) [Demonstration]	Learner should be able to describe the procedure of chemical examination of faeces and interpret the results	Principle and technique of chemical examination of faeces  Clinical significance of chemical examination of faeces	1. Observe the procedure of chemical examination of faeces  2. Interpret the results of chemical Examination of Faeces	1.Observe the procedure 2.Make entries into pathology practical record	NA
HomU G-Path M38.19	Semen analysis [Demonstration]	Learner should be able to list the physical characteristics and microscopic features of semen	Principle and technique of Semen analysis  Clinical significance of semen analysis	1. Observe the procedure of examination of semen  2. Interpret the results of the test	1.Observe the procedure 2.Make entries into pathology practical record	Not to be assessed
HomU G-Path M38.20	<b>Microbiology:</b> Use of microscope	Learner should be familiar with the different parts of microscope and their uses	Parts of compound microscope	1. Identify the different parts of microscope 2. Learn the function of each part	1.Will use and familiarise with the parts of microscope 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38. 21	<b>Microbiology:</b> Demonstration of Methods of sterilisation: Using Hot air oven, Autoclave,	Learner should be able to explain the methods of sterilization using Hot air oven, Autoclave,	Agents of sterilization Principles of dry heat and moist heat in process of sterilization	1. Observe the method of sterilization using hot air oven 2. Observe the method of sterilization using autoclave 3. Observe the method of sterilization using flaming	1.Observe the procedure 2.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38. 22	<b>Microbiology:</b> Motility preparation [Demonstration]	Learner should be able to explain the procedure of motility preparation	Principle and technique of Motility preparation	1. Observe the procedure of Motility preparation 2. Interpret the results	1.Observe the procedure 2.Make entries into and pathology practical record	Not to be assessed

HomU G-Path M38. 23	<b>Microbiology:</b> Gram staining	Learner should be able to stain the given smear by gram stain and examine under microscope and interpret the results	Principle and technique of Gram staining	1. Perform gram staining on the given sample 2. Observe under the microscope 3. Interpret the results.	1.Perform the procedure 2.Make entries into pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38. 24	<b>Microbiology:</b> Acid fast staining [Demonstration]	Learner should be able to list the steps in Acid fast staining	Principle and technique of Acid fast staining	1. To observe the procedure of Acid fast staining 2. To observe the slide for presence of acid fast bacteria .	1.Observe the procedure 2.Make entries into the pathology practical record	Not to be assessed
HomU G-Path M38. 25	Common culture medias: Preparation of common culture media [Demonstration]	Learner should be able to list the ingredients of culture medias	Principle and technique of culture media preparation	Observe the steps of preparation of common culture media	1.Observe the procedure 2.Make entries into the pathology practical record	Not to be assessed
<b>Spotters</b>						
HomU G-Path M38. 26	<b>Commonly used instruments / Equipments in pathology laboratory:</b> 1.Haemoglobinometer 2.RBC pipette 3.WBC pipette 4.Neubauer's chamber 5.ESR tubes:Wintrobe Westergren 6.Urinometer	Awareness of application and method of use of instruments,equipments in laboratory	Enumerate the commonly used instruments in laboratory and its use	<ul style="list-style-type: none"> <li>Identify the instrument / Equipment</li> <li>Enumerate the purpose/ use/utility of the instrument / Equipment</li> </ul>	1.Identify,describe the parts and list the uses of the instrument / Equipment 2.Make entries into the pathology practical record	OSPE Checklist

	7.Hot air oven 8.Autoclave 9.Incubator 10.Petri dish 11.Centrifuge 12.Waterbath 13.Inoculating loop etc.					
HomU G-Path M38. 27	<b>Interpretation of laboratory reports and its clinico pathological correlation</b> Complete Haemogram Urine reports Liver function tests Renal function tests Thyroid function tests Lipid profile Diabetic profile Serum cardiac biomarkers Enzyme markers for necrosis Serological tests, etc.	Learner should be able to interpret the values in the given laboratory reports	Significance of interpretation of laboratory tests for diagnosis	<ul style="list-style-type: none"> <li>Identify whether laboratory report is normal or abnormal in relation to physiological values</li> <li>Identify the probable reason for abnormal values in laboratory report and its clinical significance</li> </ul>	1.Study the laboratory reports 2.Interpret the values in the laboratory reports 3.Make entries into the pathology practical record	Viva voce OSPE Checklist
HomU G-Path M38. 28	Exposure to latest equipment:Auto-analyzer, Cell counter, ELISA reader etc. [Demonstration]	Learner should be able to explain the utility of latest equipment	De novo topic	<ul style="list-style-type: none"> <li>Identify the equipment</li> <li>Observe the functioning of the Equipment</li> </ul>	1.Observe the procedure 2.Make entries into the pathology practical record	Not to be assessed



HomU G-Path M38. 29	<b>Histopathology:</b> (a) Demonstration of common slides Any 15	Learner should be able to do identify the slide and mention its distinguishing features	Histopathological changes of particular condition.	<ul style="list-style-type: none"> <li>• Observe the histopathology slide</li> <li>• Identify the distinguishing features of the given histopathology slide</li> </ul>	1. Identify the histopathology slide based on identification points. 2. Make entries into the pathology practical record	OSPE Checklist
HomU G-Path M38. 30	(b) Demonstration of gross pathological specimens / models Any 15	Learner should be able to identify the gross specimen	Gross pathological changes in specimen as per General pathology and Systemic pathology topics	<ul style="list-style-type: none"> <li>• Identify the specimen</li> <li>• List three characteristic identification features of the specimen</li> </ul>	1. Identify the gross pathological specimen based on identification points. 2. Make entries into the pathology practical record	OSPE Checklist

## 6. Teaching learning methods

Lectures (Theory)	Non-lectures (Practical/Demonstrative)
Lectures	Clinical demonstration
Group discussion	Practicals /Experiential learning
Integrated lectures	Problem based discussion
	Case based learning
	Tutorials/Seminars/Symposium
	Assignments
	Library reference
	Self-learning

### Details of assessment

#### 6.1 Overall Scheme of Assessment (Summative)

Sr. No	Professional Course	Term I (1-6 Months)		Term II (7-12 Months)		
1	Second Professional BHMS	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	FUE (end of 12 months)	
		20 Marks Viva	100 Marks Practical/ Viva i) Viva voce -50 marks ii) Practical – 50 marks	20 Marks Viva	200 marks theory	200 marks Practical+ Viva+ IA

**PA: Periodical Assessment; TT: Term Test; FUE: Final University Examinations; IA: Internal Assessment**

### 7.1 Number of papers and Mark Distribution for Final University Examination (FUE)

Sr. No.	Course Code	Papers	Theory	Practical/ Clinical	Viva Voce	Internal Assessment*	Grand Total
1	HomUG-Path M	02	200 marks*	100 marks	80 marks	20 marks  (Marks of PA I + TT I + PA II)	400 marks

**\*Method of Calculation of Internal Assessment Marks for Final University Examination:**

**Marks of IA-** (Marks of PA-1 + Marks of TT + Marks of PA-2) / 140 X 20

### 7.2 Paper Layout

**Summative assessment (FUE):**

**Theory- 200 marks**

<b>Paper I (100 Mark)</b>		
General Pathology and Systemic Pathology		
1.	LAQ	50
2.	SAQ	40
3.	MCQ	10
<b>Paper II (100)</b>		
Microbiology and Parasitology		
1.	LAQ	50
2.	SAQ	40
3.	MCQ	10

### 7.3 Theme-wise distribution of questions for theory exam paper I

PAPER – 1						
Theme	Topics	Term	Marks	LAQ's	SAQ's	MCQ's
A	Cell Injury and cellular adaptation, Inflammation and repair and Homoeopathic concept	I	21	Yes	Yes	Yes
B	Neoplasia ,Immunopathology and Homoeopathic concept	I	21	Yes	Yes	Yes
C	Haemodynamic disorders ,Environmental and Nutritional diseases and Homoeopathic concept	I	17	Yes	Yes	Yes
D	Diseases of the haemopoetic system, bone marrow and blood, CVS system blood vessels and lymphatics	II	17	Yes	Yes	Yes
E	Diseases of Respiratory , GIT, Liver and gall bladder, Pancreas , kidney and lower urinary tract,Endocrine glands	II	17	Yes	Yes	Yes
F	Diseases of male and female reproductive system, skin and soft tissue, nervous, Musculo-skeletal system	II	7	No	Yes	Yes

#### 7.4 Distribution of questions for theory exam paper II

PAPER – 2						
Theme	Topics	Term	Marks	LAQ's	SAQ's	MCQ's
A	Bacteriology introduction, Human microbiome, Infection and diseases ,culture medias and methods ,Sterilisation and disinfection.	I	12	No	Yes	Yes
B	Gram positive bacterias	I	17	Yes	Yes	Yes
C	Parasites- protozoans , Virology introduction	I	17	Yes	Yes	Yes
D	Gram negative bacterias, Acid fast bacterias ,Spirochaetes	II	21	Yes	Yes	Yes
E	DNA & RNA Viruses	II	17	Yes	Yes	Yes
F	Fungi and parasites –helminthes, Diagnostic procedures in Microbiology, Homoeopathic concept	II	16	Yes	Yes	Yes

#### 7.5 Question paper blue print Paper I

A Question Serial Number	B Type of Question	Question Paper Format (Refer table 7.4 for themes)
Q1	Multiple Choice Questions(MCQ) 10 Questions 1 mark each All compulsory	1. Theme A 2. Theme B 3. Theme C 4. Theme C 5. Theme D 6. Theme D 7. Theme E

		8. Theme E 9. Theme F 10. Theme F
Q2	Short answer Questions (SAQ)  Eight Questions  5 Marks Each  All compulsory	1. Theme A 2. Theme A 3. Theme B 4. Theme B 5. Theme C 6. Theme D 7. Theme E 8. Theme F
Q3	Long answer Questions (LAQ)  Five Questions  10 marks each  All compulsory	1. Theme A 2. Theme B 3. Theme C 4. Theme D 5. Theme E

### 7.7 Question paper blue print Paper II

<b>A</b> <b>Question Serial Number</b>	<b>B</b> <b>Type of Question</b>	<b>Question Paper Format</b> <b>(Refer table 7.4 for themes)</b>
Q1	Multiple Choice Questions (MCQ)  10 Questions  1 mark each  All compulsory	1. Theme A 2. Theme A 3. Theme B 4. Theme B 5. Theme C 6. Theme C 7. Theme D 8. Theme E 9. Theme E 10. Theme F
Q2	Short answer Questions (SAQ)  Eight Questions  5 Marks Each  All compulsory	1. Theme A 2. Theme A 3. Theme B 4. Theme C 5. Theme D 6. Theme D 7. Theme E 8. Theme F
Q3	Long answer Questions (LAQ) Five Questions 10 marks each All compulsory	1. Theme B 2. Theme C 3. Theme D 4. Theme E 5. Theme F

## 7.8 Details of practical assessment

	<b>PRACTICAL EXAM</b>				
1.	Laboratory reports		Marks	Total marks	Time
	Interpretation of laboratory reports and its clinico- pathological correlation: Complete Haemogram Urine reports Liver function tests Renal function tests Thyroid function tests Lipid profile Diabetic profile Serum cardiac biomarkers Enzyme markers for necrosis Serological tests  <b>Any one of the above</b>	<ul style="list-style-type: none"> <li>Identify whether laboratory report is normal or abnormal in relation to physiological values</li> <li>Discuss the probable reason for abnormal values in laboratory report and its clinical significance</li> </ul>	<div>3</div> <div>7</div>	10 marks	10 mins
2.	<b>EXPERIMENT:</b>			<b>Total marks</b>	<b>Time</b>
a.	Estimation of Haemoglobin %	Procedural and Practical skills	15		
b.	WBC -Total count				
c.	RBC - Total count			25 marks	30 minutes
d.	Differential count	Result and Discussion			
e.	Bleeding time and Clotting time		10		
f.	Determination of Blood group				
f.	Physical examination of urine				
g.	Chemical examination of urine				
h.	Urine microscopy				
i.	Gram staining				
	<b>Any one of the above</b>				





**For Examiner:**

<b>Sr. No</b>	<b>Key</b>	<b>Max. Marks</b>
1.	Identify whether laboratory report is normal or abnormal in relation to physiological values	2
2.	Discuss the probable reason for abnormal values in laboratory report and its clinical significance	3

**STATION # 02 (UNOBSERVED STATION)**

**For Organizer:**

**TOPIC SPECIFICATION: Identification of Histopathological slide(5 nos)**

**SAMPLE MATERIAL:Histopathological slide**

**For Candidate:**

**Max. Marks: 05 Time Allowed: 03minutes for each slide**

**Task:** Carefully identify the spotter -Histopathological slide and answer the following questions:

- Identify the histopathology slide (2)
- List three features of the given histopathology slide (3)

**For Examiner:**

<b>Sr. No</b>	<b>Key</b>	<b>Max. Marks</b>
1.	Identify the histopathology slide	2
2.	•List three features of the given histopathology slide	3

**STATION # 03 (UNOBSERVED STATION)****For Organizer:****TOPIC SPECIFICATION: Identification of appliances: (2 nos)****SAMPLE MATERIAL:Appliances****For Candidate:****Max. Marks: 05 Time Allowed: 03minutes- for each spotter****Task:** Carefully identify the spotter -Appliance and answer the following questions:

- Identify the spotter (1)
- Description of the appliance (2)
- Uses of the appliance (2)

**For Examiner:**

Sr. No	Key	Max. Marks
1.	Identification	1
2.	Description	2
3.	Uses	2

**STATION # 04 (UNOBSERVED STATION)****For Organizer:****TOPIC SPECIFICATION: Gross specimens/models(2 nos)****SAMPLE MATERIAL:** Gross specimen /model**For Candidate:****Max. Marks: 05 Time Allowed: 03minutes -for each spotter****Task:** Carefully identify the specimen/model and answer the following questions:

- Identify the specimen (2)
- List three characteristic features of the specimen (3)

**For Examiner:**

<b>Sr. No</b>	<b>Key</b>	<b>Max. Marks</b>
1.	Specimen identification	2
2.	three characteristic features of the specimen	3

**STATION # 05(UNOBSERVED STATION)**

**For Organizer:**

**TOPIC SPECIFICATION:** Spotter-disinfectant

**SAMPLE MATERIAL:** disinfectant

**For Candidate:**

**Max. Marks: 05 Time Allowed: 03minutes.**

**Task:** Carefully identify the spotter –disinfectant and answer the following questions:

- Identify the disinfectant (2)
- Enumerate the uses of the disinfectant (3)

**For Examiner:**

<b>Sr. No</b>	<b>Key</b>	<b>Max. Marks</b>
1.	Identify the disinfectant	2
2.	Enumerate the uses of the disinfectant	3

**STATION # 06 (OBSERVED STATION)**

**For Organizer:**

**TOPIC SPECIFICATION:** Practical (haematology/urine/gram staining)

**SAMPLE MATERIAL:**Blood /Urine/Smearred slide

**For Candidate:**

**Max.Marks: 25 Time Allowed: 30minutes.**

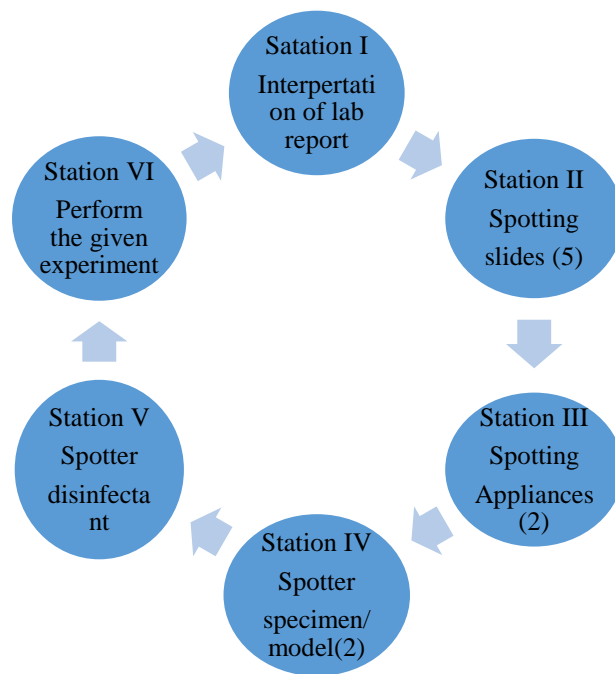
**Task:** Carefully perform the experiment given

- Write the procedure and perform the experiment (15)
- Write the result obtained and its Discussion (10)

**For Examiner:**

Sr. No	Key	Max. Marks
1.	Procedural and Practical skills	15
2.	Result and Discussion	10

### OSPE STATIONS



## 9. List of recommended text/reference books

### Theory

1. Harsh Mohan ( 2023), *Textbook of Pathology* (9<sup>th</sup> Edition). Jaypee Publisher (CBME)
2. Vinay Kumar and Abul K Abbas(2023) ,*Robbins & Kumar Basic Pathology* (11<sup>th</sup> SAE), Elsevier
3. Apurba S Sastry , Sandhya Bhat ( 2023), *Essentials of Medical Microbiology* (4<sup>th</sup> Edition), ARYA Publications. (CBME) CBS publishers.
4. Ananthanarayan.R and Jayaram Paniker CK (2022), *Ananthanarayan and Paniker's Textbook of Microbiology* (12<sup>th</sup> Edition),Universities Press (CBME)
5. Chatterjee K D, ( 2023), *Parasitology ( Protozoology and Helminthology )*, (13<sup>th</sup> Edition),CBS publishers.
6. Ghosh Sougata (2021), *Paniker's Textbook of Medical Parasitology*,(9<sup>th</sup> Edition), Jaypee Publisher (CBME)
7. Fiona Roberts , (2018),*Pathology Illustrated International* ,(8<sup>th</sup> Edition) , Elsevier
8. Nayak Ramadas(2017),*Essentials in Hematology and Clinical Pathology*, (2<sup>nd</sup> Edition), Jaypee Publishers.
9. Sunil Kumar Mohanty (2014),*Text Book of Immunology*, (2<sup>nd</sup> Edition), Jaypee Brothers Medical Publishers

### Practical

1. Harsh Mohan , (RP 2023) *Practical Pathology*, (5<sup>th</sup> Edition). Jaypee Publisher (CBME)
2. Santosh Kumar Mondal , (2024) *Pathology Practicals With OSPE*, (2<sup>nd</sup> Edition), CBS Publishers. (CBME)
3. Anamika Vyas, Sheethal. S (2023), *Concise Workbook in Practical Microbiology*, Jaypee Publishers. (CBME)
4. Dr Baveja C P(2021), *Practical Microbiology for MBBS*, (5<sup>th</sup> Edition), ARYA Publications

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Govt of NCT of Delhi

**Subject:** Practice of Medicine

**Subject code:** HomUG PM-I

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## **1. Preamble**

Practice of Medicine with Homoeopathic therapeutics is concerned with study of clinical methods, clinical presentations of systemic diseases, differential diagnosis and prognosis, general management and integration with Homoeopathic principles to evolve homoeopathic therapeutics.

Homoeopathy has a distinct approach to the concept of disease. It recognizes the ailing individual by studying him as a whole rather than in terms of sick parts and emphasizes the study of the man, his state of health, state of illness. The emphasis is on study of man in respect of health, disposition, diathesis, disease, taking all predisposing and precipitating factors, i.e. fundamental cause, maintaining cause and exciting cause. The study of the concept of individualization is essential so that the striking features which are characteristic to the individual become clear, in contrast to the common picture of the respective disease condition. Hahnemann's theory of chronic miasms provides us an evolutionary understanding of the chronic diseases: psora, sycosis, tubercular and syphilis, and acute manifestations of chronic diseases and evolution of the natural disease shall be comprehended in the light of theory of chronic miasms.

This will demand correlation of the disease conditions with basics of anatomy, physiology, biochemistry and pathology. Application of Knowledge of Organon of Medicine and Homoeopathic Philosophy, Materia Medica and Repertory in dealing with the disease conditions should be actively taught.

Life style disorders have burgeoned in modern times. Homoeopathy has a great deal to offer through its classical holistic approach. There are plenty of therapeutic possibilities which Homoeopathy needs to exploit in the years to come.

## **2. Course outcomes**

- i. Develop as a sound homoeopathic clinician who can function indifferent clinical settings by applying knowledge, clinical skills and attitudes in studying the individual as a whole.
- ii. Able to correlate the disease conditions with the basics of anatomy, physiology, biochemistry and pathology.
- iii. Able to apply the knowledge of causation, pathophysiology, pathogenesis, manifestations, and diagnosis (including differential diagnosis) to understand the disease.
- iv. Develop adequate knowledge for rational use of investigations and its interpretation to arrive at a final diagnosis of disease.
- v. Ability to make a rational assessment of prognosis and general management of different disease conditions.

- vi. Ability to understand and provide preventive, curative, palliative, rehabilitative and holistic care with compassion, following the principles of Homoeopathy.
- vii. Able to integrate the clinical state of the disease with the concepts of Organon of Medicine and Homoeopathic Philosophy, Repertory and Homoeopathic Materia Medica for the management of the patient.

### 3. Learning objectives

At the end of BHMS II course, the students should be able to-

- i. Clinico-pathological evaluation of common signs and symptoms with miasmatic integration.
  - a. Understanding Common Signs and Symptoms:** By the end of the course, students will be proficient in recognizing and evaluating common signs and symptoms presented by patients, utilizing a holistic approach that integrates clinical and pathophysiological processes involved.
  - b. Diagnostic Competence:** Through case-based learning and clinical exposure, students will develop the skills necessary to conduct comprehensive clinico-pathological evaluations, to identify underlying disease tendencies and susceptibilities.
  - c. Therapeutic Proficiency:** Students will be able to select Homoeopathic remedies based on the disease expression.
- ii. Infectious Diseases general outline and introduction and common expression and investigation; Water & Electrolyte Disturbances, Acid Base Metabolism
  - a. Comprehensive Understanding:** Students will acquire a comprehensive understanding of the principles of infectious diseases, including their aetiology, pathogenesis, epidemiology, and clinical manifestations, within the context of homeopathic philosophy.
  - b. Recognition of Common Infections:** Through case studies and practical sessions, students will learn to identify common infectious diseases encountered in clinical practice, integrating homeopathic principles with conventional approaches to diagnosis.
  - c. Diagnostic Approach:** Students will develop proficiency in employing diagnostic methods relevant to infectious diseases, including physical examination findings, laboratory tests, and imaging studies, while considering holistic aspects of the patient's health.

**d. Introduction to Prevention and Control Measures:** Students will be able to define preventive strategies and public health measures aimed at controlling the spread of infectious diseases, incorporating principles of homeopathy into discussions of hygiene, immunity, and environmental factors.

iii. General Considerations of Immunity & Susceptibility

**a. Understanding Immune Function:** Students will acquire a comprehensive understanding of the immune system, including its cellular and humoral components, mechanisms of recognition, and response to pathogens and foreign antigens.

**b. Exploration of Susceptibility:** Through theoretical study and clinical case discussions, students will explore the concept of susceptibility in homeopathy, examining factors that influence an individual's predisposition to disease and their response to homeopathic treatment.

**c. Integration of Immune Concepts:** Students will learn to integrate concepts of immunity and susceptibility into the homeopathic framework, considering the role of constitutional factors, miasmatic influences, and environmental exposures in shaping an individual's health status.

iv. Introduction to Medical Genetics

**a. Foundational Principles:** Students will gain introductory understanding of medical genetics, including principles of inheritance, genetic variation, and gene-environment interactions relevant to human health and disease.

**b. Genetic Disorders:** Through theoretical study, students will familiarize themselves with common genetic disorders, including single gene disorders, chromosomal abnormalities, and their clinical manifestations.

These course outcomes aim to equip second-year homeopathy degree students with the knowledge, skills, and perspectives necessary to approach the evaluation and management of common clinical presentations, infectious diseases and establishing the relationship between knowledge of genetics and immunology with Homeopathic concept of qualitative aspects of Susceptibility.

#### 4. Course content and its term-wise distribution

Theory	Non-lectures (Clinical/Demonstrative)
<b>Term I</b>	
1. Clinico - pathological evaluation of common signs and symptoms with miasmatic integration* 2. Introduction to Medical genetics*	Clinical: 10 Demonstrative: 2
<b>Term II</b>	
1. Immunity & Susceptibility - General considerations* 2. Infectious Diseases and Tropical Diseases*	Clinical: 10 Demonstrative: 2

*\*Refer clause 5.4 and tables 5.4.1 – 5.4.5 for detailed content (topics breakup)*

#### 5. Teaching hours

##### 5.1. Gross division of teaching hours

<b>Practice of Medicine</b>			
<b>Year</b>	<b>Teaching hours- Lectures</b>	<b>Teaching hours- Non-lectures</b>	<b>Total</b>
II BHMS	80	24	104

### 5.2. Teaching hours theory

Sr. No.	Topic	Hours
1	Clinico - pathological evaluation of common signs and symptoms with miasmatic integration	35
2	Immunity & Susceptibility - General considerations	5
3	Introduction to Medical genetics	5
4	Infectious Diseases and Tropical Diseases	35
<b>Total</b>		<b>80</b>

### 5.3. Teaching hours Non-lecture

Sr. No.	Non-lectures	Hours
	<b>Clinical</b>	
1	Approach to Patient: a) Doctor & Patient: General Principles of History Taking b) Physical Examination General Principles c) Differential Diagnosis: The beginning of management plan	3
2	General Assessment: a) Psychological Assessment b) Nutritional Assessment	3
3	General Physical Examination Skill	14
	<b>Demonstrative</b>	
4	Case Based / Problem Based Discussion on any of the topic of II BHMS Syllabus topic to be conducted <i>[as per availability of the case material or patient]</i>	4
<b>Total</b>		<b>24</b>

#### 5.4. Distribution of teaching hours with breakup of each topic

##### 5.4.1. Clinico - pathological evaluation of Common signs and symptoms with miasmatic integration

##### *Cardinal Manifestations and Presentation of Diseases with relevant investigations*

(Ref: Harison's Principles of Internal Medicine 21<sup>st</sup>Ed)

Sr. No.	Topic	Topic breakup	Hours
1	Pain	1) <b>Pain:</b> Pathophysiology, types of pain	4
		2) Chest Discomfort	
		3) Abdominal Pain	
		4) Headache	
		5) Back and Neck Pain	
2	Alterations in Body Temperature	6) <b>Fever:</b> Definition, types of fever, aetiology, pathophysiology, physical examination, investigations and management	3
		7) <b>Fever and Rash:</b> Definition of rash, Approach - causes and its presentation, examinations, investigations and management	
		8) <b>Fever of Unknown Origin:</b> Definition, types, aetiology and epidemiology, diagnostic tests, differential diagnosis and management	
3	Neurological Symptoms	9) <b>Syncope:</b> Definition, classification and its aetiology and its pathophysiology, clinical features as per the types, investigations, management	6
		10) <b>Dizziness and Vertigo:</b> Definition, clinical approach with its pathophysiology and management	
		11) <b>Fatigue:</b> Definition, differential diagnosis, clinical approach and management	

Sr. No.	Topic	Topic breakup	Hours
		12) <b>Neurologic Causes of Weakness and Paralysis:</b> Definition [Weakness, Paralysis, Tone, Spasticity, Rigidity, Paratonia, flaccidity, Fasciculations], Pathogenesis [Upper Motor Neuron Weakness, Lower Motor Neuron Weakness, Neuromuscular Junction Weakness, Myopathic Weakness, & Psychogenic Weakness], Distribution and its approach.	
		13) <b>Numbness, Tingling, and Sensory Loss:</b> Definition, pathophysiology and differential diagnosis	
		14) <b>Gait Disorders, Imbalance, and Falls:</b> <ul style="list-style-type: none"> <li>a) Anatomy and physiology related to Gait balance.</li> <li>b) Definition, pathophysiology and clinical significance related to different types of gait disorders.</li> <li>c) Definition, pathophysiology and clinical manifestation of disorders of balance.</li> <li>d) Assessment for the patient with falls.</li> </ul>	
		15) <b>Confusion and Delirium:</b> Definition, epidemiology, risk factors, pathogenesis, clinical features, physical examinations, investigations, diagnostic criteria, differential diagnosis and general management.	
		16) <b>Coma and disorders of consciousness:</b> Definition, stages, Diagnostic approach: History, aetiology and its differential diagnosis, neurological examinations, investigations, management and prognosis	
		17) <b>Dementia:</b> Definition, functional anatomy of dementia, aetiology and its differential diagnosis, Diagnostic approach: History physical & neurological examinations,	

Sr. No.	Topic	Topic breakup	Hours
4	Circulatory and Respiratory Dysfunctions	cognitive and neuropsychiatric examination, investigations and management	6
		18) <b>Aphasia, Memory Loss, and Other Cognitive Disorders:</b> Definition, applied anatomy, clinical examination	
		19) <b>Sleep Disorders:</b> Physiology of sleep and wakefulness, approach to sleep disorders and treatment; evaluation of insomnia and its treatment	
		20) <b>Dyspnoea:</b> Definition, epidemiology, mechanisms underlying dyspnoea, assessment, differential diagnosis; Clinical approach: history, physical examination, investigations and management.	
		21) <b>Cough:</b> Definition, mechanism of cough, impaired cough, aetiology, classification, assessment of chronic cough, differential diagnosis, approach: history, physical examination, investigations and management.	
4	Circulatory and Respiratory Dysfunctions	22) <b>Haemoptysis:</b> Definition, understanding anatomy & physiology of it, aetiopathogenesis, evaluation of haemoptysis: history, physical examination, diagnostic evaluation, and management.	6
		23) <b>Hypoxia and Cyanosis:</b> a) <b>Hypoxia:</b> Definition, response to hypoxia, aetiology, pathophysiology, adaptation to hypoxia. b) <b>Cyanosis:</b> Definition, types, differential diagnosis with its aetiology, approach to cyanosis.	
		24) <b>Oedema:</b> Definition, aetiopathogenesis, differential diagnosis – Generalized and Localized oedema;	



Sr. No.	Topic	Topic breakup	Hours
5	Abdominal/GIT Dysfunctions	distribution of oedema; Approach: History taking, Clinical examination and investigations.	
		25) <b>Palpitations:</b> Definition, aetiopathogenesis, differential diagnosis, Approach: History taking, Clinical examination, investigations and management.	
		26) <b>Dysphagia:</b> Definition, physiology of swallowing, pathophysiology; Approach: history taking, Clinical examination, diagnostic procedures and management.	6
		27) <b>Nausea, Vomiting and Indigestion:</b> Definition, mechanism, causes & differential diagnosis, Approach: history taking, Clinical examination, diagnostic testing and management.	
		28) <b>Diarrhoea and Constipation:</b> Definition, Normal physiology, types and causes, differential diagnosis, Approach: history taking, Clinical examination, diagnostic testing and management.	
		29) <b>Dysentery:</b> Definition, causes, differential diagnosis, Approach: history taking, Clinical examination, diagnostic testing and management.	
		30) <b>Unintentional Weight Loss:</b> Definition, physiology of weight regulation with aging, causes and differential diagnosis, assessment and testing, management.	
		31) <b>Gastrointestinal Bleeding:</b> Definition, source of the bleeding and its causes and its mechanism, Approach: history taking, differentiation of UGIB & LGIB - its assessment, evaluation and management.	

Sr. No.	Topic	Topic breakup	Hours
		32) <b>Jaundice:</b> Definition, clinical evaluation, metabolism of bilirubin, aetiopathogenesis, classification and its causes, differential diagnosis, Approach: history taking, Clinical examination, diagnostic testing and management.	
		33) <b>Abdominal Swelling &amp; Ascites:</b> Definition, causes, differential diagnosis, Approach: history taking, Clinical examination, investigations and its evaluation. Ascites: Definition, aetiopathogenesis, evaluation, management and complications.	
6	Renal and Urinary Tract Dysfunctions	34) <b>Interstitial Cystitis / Bladder Pain Syndrome:</b> Definition, aetiopathogenesis, clinical presentation, investigations, diagnostic evaluation, management, complication and prognosis.	4
		35) <b>Dysuria:</b> Definitions, aetiology, pathophysiology, assessment and diagnostic evaluation.	
		36) <b>Azotaemia and Urinary Abnormalities:</b> Definitions, aetiology, pathophysiology, assessment and diagnostic evaluation.	
		37) <b>Fluid and Electrolyte Imbalance:</b> Causes, pathophysiological evaluation, Investigations	
7	Haematological alterations	38) <b>Anaemia:</b> Definition, applied anatomy & physiology of RBC, regulation of its production; classification, clinical presentation; Approach: History taking, clinical examination, investigations and diagnostic evaluation	4
		39) <b>Leucocytosis &amp; Leukopenia:</b> Definition, Aetiology, differential diagnosis.	

Sr. No.	Topic	Topic breakup	Hours
		40) <b>Bleeding diatheses: Bleeding &amp; Thrombosis:</b> Definitions, applied anatomy & physiology of Haemostasis, aetiology of disorder of haemostasis, clinical presentation and history taking, clinical examination, laboratory evaluation.	
		41) <b>Interpretation of Peripheral Blood Smears</b>	
8	Psychological symptoms	42) Causes of asthenia, anxiety, sadness, thought disorders and delusions, perceptual disorders and hallucinations and relevant investigations	2
<b>Total</b>			<b>35</b>

#### 5.4.2 Medical genetics:

Sr. No.	Topic lecture	Hours
1	Cytogenetics - definition, classification of chromosomal abnormality	1
2	Down's Syndrome	1
3	Turner's & Klinefelter's Syndrome	
4	Cystic fibrosis, Huntington's disease & Marfan's syndrome	1
5	Poly cystic kidney disease	
6	Neoplasia	1
7	Rare diseases – basic concept	
8	Integrating concept of Genetics with Homoeopathy	1
<b>Total</b>		<b>5</b>

#### 5.4.3 Immunological factors in disease with concept of susceptibility:

Sr. No.	Topic lecture	Hours
1	Introduction and Primary & Secondary Immunodeficiency States	1
2	Hypersensitivity reactions: I, II, III, IV	1
3	Autoimmune diseases	1
4	Transplants, Graft rejection	
5	HIV	1
6	Integrating concept of Immunity with Homoeopathy: Susceptibility	1
<b>TOTAL</b>		<b>5</b>

#### 5.4.4 For study of infectious and tropical diseases: Emphasis shall be on the following headings:

- i. Definition
- ii. Causative agents
- iii. Epidemiology
- iv. Pathogenesis
- v. Clinical features
- vi. Investigations
- vii. Diagnostic features
- viii. Differential Diagnosis
- ix. Complications
- x. Management
- xi. Prevention
- xii. Prognosis
- xiii. Homoeopathic classification of disease with its reasons
- xiv. Repertorial coverage / reference related to the disease
- xv. Homoeopathic therapeutics to the disease

Sr. No.	Topic Lecture	Hours
1	Herpes simplex viruses [HSV] infections	1
2	Varicella-zoster virus (VZV) infection	1
3	Epstein-Barr virus [EBV] Infections	1
4	Poliovirus Infections	1
5	Measles	1
6	Mumps	1
7	Rabies	1
8	Dengue	1
9	Japanese B Encephalitis	1
10	BIRD FLU	2
11	Influenza A H1N1 virus	
12	Chikungunya	
13	COVID 19 Virus Infection	1
14	Yellow fever	1
15	Smallpox (variola) - poxvirus infection	1
16	HIV Infection	1
17	Zika virus infection	1
18	Rickettsial infection	
19	Staphylococcal, streptococcal infections	1
20	Typhoid Fever	1
21	Gastroenteritis	1
22	Cholera	1
23	Tetanus	1
24	Anthrax, brucellosis, plague	1
25	Leprosy	1
26	Sexually Transmitted Disease, Syphilis	1

Sr. No.	Topic Lecture	Hours
27	Amoebiasis, Amoebic Liver Abscess	1
28	Filariasis / Worm infestations	1
29	Malaria & Kalazar	1
30	Leptospirosis	1
31	Tuberculosis	1
32	Extra pulmonary tuberculosis	1
33	Diphtheria	1
34	Pertussis (whooping cough)	1
35	Therapeutics of Infectious Disorders	3
<b>TOTAL</b>		<b>35</b>

#### 5.4.5 Teaching hours distribution to clinical / practical / demonstrative activities (Non-lectures):

Sr. No.	Non-lectures	Hours
1	<b>Approach to Patient:</b> d) Doctor & Patient: General Principal of History Taking e) Physical Examination General Principal f) Differential Diagnosis: The beginning of management plan	3
2	<b>General Assessment:</b> c) Psychiatric Assessment d) Nutritional Assessment	3
3	<b>General Examination Skill:</b>	14
	i.) Temp recording and its documentation and interpretation	1
	ii.) Pulse examination at different site and its documentation and interpretation	
	iii.) RR examination and its documentation and interpretation	1
	iv.) BP Recoding and its documentation and its interpretation	
	v.) Height measurement and its documentation and interpretation	1

Sr. No.	Non-lectures	Hours
	vi.) Weight measurement and its documentation and interpretation	1
	vii.) BMI and Nutrition Assessment and its documentation and interpretation	
	viii.) Observation of Appearance, Built, and assessing Body proportion: Documentation and interpretation	
	ix.) Observation of Gait and its Assessment& documentation	
	x.) Observation of Decubitus and its assessment& documentation	
	xi.) Ear examination and its documentation and interpretation	3
	xii.) Nose examination and its documentation and interpretation	
	xiii.) Throat examination and its documentation and interpretation	
	xiv.) Eye examination and its documentation and interpretation	2
	xv.) Face examination and its documentation and interpretation	2
	xvi.) Mouth examination and its documentation and interpretation	
	xvii.) Lymph Nodes examination at different sites and documentation and interpretation	3
	xviii.) Nails examination and its documentation and interpretation	
	xix.) Skin examination and its documentation and interpretation	
4	<b>Case Based / Problem Based Discussion on any of the following topic to be conducted <i>[as per availability of the case material or patient]</i></b>	4
	a) Approach to Case of Fever with any system presenting symptoms [GIT / RS / Skin / Renal / MSS etc.]	
	b) Approach to Case presenting with Neurological Symptoms	
	c) Approach to Case presenting with Circulatory and / or Respiratory Symptoms	
	d) Approach to Case presenting with Abdominal/GIT Symptoms	
	e) Approach to Case presenting with Renal and Urinary Tract symptoms	
	f) Approach to Case presenting with Haematological symptoms	
	g) Approach to Case presenting with psychological symptoms	

## 6. Content mapping (competencies tables)

### 6.1. Competency tables for clinico-pathological evaluation of common signs and symptoms with miasmatic integration:

#### 6.1.1. Pain-

Sl. No	Domain of Competency	Millers Level:	Content	SLO	Blooms Domain/ Guilbert 's Level	Priority -	T-L Methods	Assessment		Integration
								Formative	Summative	
HomU G-PM I.1.1	K&S	K	Define pain and its types	1. Define pain and 2. Differentiate between acute and chronic pain	C1	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.2		KH	Differentiate between types of pain	Differentiate between nociceptive, neuropathic, and inflammatory pain	C2	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.3			Role of inflammation in pain	Describe how inflammation contributes to pain sensation and hypersensitivity	C2	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.4		K	Define chest discomfort and its significance	1. define chest discomfort and 2. explain its importance in diagnosing	C1	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology



				various conditions						
HomU G-PM I.1.5		KH	Describe the common causes of chest discomfort	Describe the common etiologies of chest discomfort, such as angina, heartburn, and musculoskeletal pain	C2	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.6		K	Define abdominal discomfort and its significance	1. Define abdominal discomfort and 2. Explain its importance in diagnosing various conditions	C1	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.7		KH	Describe the common causes of abdominal discomfort	Describe the common etiologies of abdominal discomfort, such as gastritis, appendicitis, and constipation	C2	Must Know	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology

HomU G-PM I.1.8		K	Define headache and its types	1. define headache and 2. differentiate between primary and secondary headaches	C1	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.9		KH	Describe the common causes of headache	Describe the common etiologies of headache, such as tension-type headache, migraine, and cluster headache	C2	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.10		K	Define back and neck pain and their types	1. define back and neck pain and 2. differentiate between mechanical and non-mechanical causes	C1	MK	Lecture, Group discussion	Quiz, Written test	SAQ, MCQ	Anatomy, Physiology
HomU G-PM I.1.11		KH	Describe the common causes of back and neck pain	Describe the common etiologies of back and neck pain, such as muscle strain, disc herniation, and osteoarthritis	C2	MK	Lecture, Group discussion	Quiz, Written test	SAQ, MCQ	Anatomy, Physiology

HomU G-PM I.1.12	HO	K	Define the principles of homoeopathic management of pain	define homoeopathic principles for pain management, emphasizing 1. individualization and 2. similars	C1	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Organon and Homoeopathic Philosophy
HomU G-PM I.1.13		KH	Describe the concept of the simillimum in homoeopathy	Describe how remedies are selected based on symptom similarity in pain management	C2	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Organon and Homoeopathic Philosophy
HomU G-PM I.1.14			Explain the role of repertories in homoeopathic prescribing	Discuss repertory usage to find the most suitable remedy for pain	C2	MK	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Repertory
HomU G-PM I.1.15		SH	Demonstrate the process of selecting a homoeopathic remedy	Demonstrate remedy selection based on totality symptoms in case of pain	P2	MK	Case studies	OSCE, Practical exam	Bedside examination, Viva voce	Materia Medica
HomU G-PM I.1.16		KH	Explain the principles of case management in homoeopathy	Discuss posology in pain treatment	C2	Must Know	Lecture, Group discussion	Quiz, Written test, MCQ	SAQ, MCQ	Organon, Homoeopathic Pharmacy

### 6.1.2. Fever-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority -	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.2.1	K&S	K	Define fever and its significance	Define fever and explain its role in the body's immune response	C1	MK	Lecture, Group discussion	Quiz, Written test		Physiology, Pathology
HomU G-PM I.2.2		KH	Describe the types of fever and their characteristics	Describe different types of fever, such as intermittent and continuous	C2	MK	Lecture, Group discussion	Quiz, Written test		Physiology, Pathology
HomU G-PM I.2.3			Explain the causes of fever	Explain the causes of fever, including infection and inflammation	C2	MK	Lecture, Group discussion	Quiz, Written test		Microbiology, Immunology
HomU G-PM I.2.4		K	Define the different types of fever (e.g., intermittent, remittent, continuous, relapsing).	Explain the characteristics and patterns of different types of fever.	C1	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases

HomU G-PM I.2.5		KH	Describe the etiology of each type of fever.	Explain the underlying causes of intermittent, remittent, continuous, and relapsing fevers.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases
HomU G-PM I.2.6			Discuss the clinical manifestations and symptoms associated with each type of fever.	Identify the clinical features and presentations of intermittent, remittent, continuous, and relapsing fevers.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases
HomU G-PM I.2.7		K	Define fever with rash.	Explain the clinical presentation of fever accompanied by a rash.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases, Dermatology
HomU G-PM I.2.8		K	Identify the common causes of fever with rash (e.g., viral infections, bacterial infections, allergic reactions).	Describe the etiological factors contributing to the development of fever with rash.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases, Dermatology

HomU G-PM I.2.9		KH	Discuss the differential diagnosis of fever with rash.	Explain the process of differentiating between various infectious and non-infectious causes of fever with rash.	C2	Must Know	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases, Dermatology
HomU G-PM I.2.10		K	Define Fever of Unknown Origin (FUO).	Explain the criteria/definition of FUO.	C1	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases
HomU G-PM I.2.11		KH	Discuss the etiology and pathophysiology of FUO.	Describe the possible causes and underlying mechanisms of FUO.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases
HomU G-PM I.2.12			Identify the diagnostic approach to FUO.	Explain the stepwise approach to diagnosing and investigating FUO.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases
HomU G-PM I.2.13			Discuss the differential diagnosis of FUO.	Explain how to differentiate between various causes of FUO.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases

HomU G-PM I.2.14			Describe the management strategies for FUO.	Explain the treatment options and approaches for patients with FUO.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory and Viva voce	Internal Medicine, Infectious Diseases
HomU G-PM I.2.15		K	Describe the fever totality.	Define how to erect a fever totality	C1	MK	Lecture, Small group discussion	Tutorials, Assignments		Organon, Repertory
HomU G-PM I.2.16		KH	Discuss the characteristic indications of various indicated drugs	List the PQRS symptoms of a drug in Fever	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	Theory & Viva voce	Materia Medica

### 6.1.3. Neurological Symptoms-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert 's Level	Priority -	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.3.1	K&S	K	Define the pathophysiology of neurological symptoms (e.g., weakness, numbness, tingling).	Explain the underlying mechanisms that lead to neurological symptoms.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	MCQs	Anatomy, Physiology, Neurology
HomU G-PM I.3.2		KH	Describe the neuroanatomical basis of common neurological symptoms.	Explain how specific neurological structures are involved in producing symptoms such as weakness or sensory changes.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	SAQ, MCQs	Anatomy, Physiology, Neurology
HomU G-PM I.3.3			Discuss the pathophysiological processes underlying various neurological conditions.	Explain how different diseases and disorders affect the nervous system to produce specific symptoms.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	SAQ, MCQs	Physiology, Pathology



HomU G-PM I.3.4			Identify the role of neurotransmitters and receptors in neurological symptoms.	Explain how alterations in neurotransmission can lead to neurological symptoms.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	SAQ, MCQs	Physiology, Pathology
HomU G-PM I.3.5	K&S	KH	Define the principles of management for neurological symptoms.	Explain the basic approaches to managing common neurological symptoms.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	SAQ, MCQs	Physiology
HomU G-PM I.3.6		K	Describe the complete symptom	Define the symptom under LSMC	C1	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	LAQ, SAQ, Viva voce	Organon
HomU G-PM I.3.7		S	Demonstrate the process of selecting a homoeopathic remedy for neurological symptoms based on totality of symptoms	Student should be able to demonstrate how to select a homoeopathic remedy based on the totality of symptoms in a case of neurological symptoms	P2	MK	Lecture, Small group discussion	Assignments, Tutorials	SAQ, MCQs	Materia medica

HomU G-PM I.3.8		KH	Discuss the characteristic indications of various indicated drugs	List the PQRS symptoms of a drug in different Neurological symptoms	C1	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	SAQ, Viva voce	Materia medica
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#### 6.1.4. Circulatory and Respiratory Dysfunctions

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority -	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.4.1	K&S	K	Define dyspnea.	Define dyspnea as the sensation of difficult or uncomfortable breathing, often described as shortness of breath.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Physiology
HomU G-PM I.4.2		KK	Describe the physiology of dyspnea.	Explain the physiological mechanisms that contribute to the sensation of dyspnea, including neural and mechanical factors.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	SAQ, MCQs	Physiology

HomU G-PM I.4.3			Discuss the etiology of dyspnea.	Explain the various conditions and diseases that can cause dyspnea, such as respiratory disorders, cardiovascular diseases, or metabolic conditions.	C2	MK	Lecture, Small group discussion	Structured Oral Examination, Tutorials, Assignments, MCQs	SAQ, MCQs	Physiology, Pathology
HomU G-PM I.4.4			Identify the clinical evaluation and diagnostic approach for patients presenting with dyspnea.	Explain the steps involved in assessing and diagnosing patients with dyspnea, including history taking, physical examination, and diagnostic tests.	C2	MK	Lecture, Small group discussion	Observations, Simulations	OSCE, Bedside examination	Clinical Medicine
HomU G-PM I.4.5		K	Define cough.	Define cough as a protective reflex that helps clear the airways of mucus, irritants, or foreign particles.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	Written examination, Objective Structured Clinical Examination (OSCE)	Clinical Medicine
HomU G-PM I.4.6		KH	Describe the physiology of cough.	Explain the neural and mechanical processes involved in the	C2	MK	Lecture, Small group	Case studies, Role-playing	OSCE, Practical examination	Clinical Medicine

				generation of a cough reflex.			discussion			
HomU G-PM I.4.7			Discuss the different types of cough.	Explain the characteristics and classification of cough, such as acute, subacute, or chronic.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Pathology
HomU G-PM I.4.8			Identify the common causes of cough.	Describe the etiology and pathophysiology of cough, including respiratory infections, asthma, and GERD.	C2	MK	Lecture, Small group discussion	Presentations, Group projects	Written examination, Case-based discussion	Physiology, Pathology
HomU G-PM I.4.9	K&S		Describe the characteristics of different types of cough.	Explain the differences between dry, wet, productive, and non-productive coughs, and their potential underlying causes.	C2	MK	Lecture, Small group discussion	Quizzes, Peer assessment	Written examination, OSCE	
HomU G-PM I.4.10		K	Define hemoptysis.	Define hemoptysis as the expectoration of blood that originates from the respiratory tract.	C2	MK	Lecture, Small group discussion	Quizzes, Peer assessment	Written examination, OSCE	Pathology

HomU G-PM I.4.11		KH	Describe the etiology of hemoptysis.	Explain the various causes of hemoptysis, including respiratory infections, pulmonary embolism, and lung cancer.	C2	MK	Lecture, Small group discussion	Case studies, Role-playing	OSCE, Practical examination	Pathology
HomU G-PM I.4.12			Discuss the clinical evaluation and diagnostic approach for patients presenting with hemoptysis.	Explain the steps involved in evaluating patients with hemoptysis, including history taking, physical examination, and diagnostic tests.	C2	MK	Lecture, Small group discussion	Observations, Simulations	OSCE, Practical examination	Pathology
HomU G-PM I.4.13	K&S		Discuss the complications associated with hemoptysis.	Explain the potential complications of hemoptysis, such as respiratory compromise or hemorrhagic shock, and their management.	C2	MK	Lecture, Small group discussion	Problem-based learning, Assignments	MCQs, Short-answer questions	Pathology

HomU G-PM I.4.14		K	Define hypoxia and cyanosis.	Define hypoxia as a condition characterized by insufficient oxygen supply to tissues and cyanosis as a bluish discoloration of the skin and mucous membranes due to deoxygenated hemoglobin.	C1	MK	Lecture, Small group discussion	Quizzes	Written examination, Objective Structured Clinical Examination (OSCE)	Pulmonology, Cardiology, Critical Care Medicine
HomU G-PM I.4.15		KH	Describe the pathophysiology of hypoxia and cyanosis.	Explain the mechanisms that lead to hypoxia and cyanosis, including impaired oxygen delivery or utilization.	C2	MK	Lecture, Small group discussion	Case studies	OSCE, Practical examination	Pulmonology, Cardiology, Critical Care Medicine
HomU G-PM I.4.16			Discuss the common causes of hypoxia and cyanosis.	Explain the various conditions and diseases that can manifest with hypoxia and cyanosis, such as respiratory disorders, cardiac conditions, or anemia.	C2	MK	Lecture, Small group discussion	Case studies	MCQs, Short-answer questions	Pulmonology, Cardiology, Critical Care Medicine

HomU G-PM I.4.17	PC		Discuss the clinical evaluation and diagnostic approach for patients presenting with hypoxia and cyanosis.	Explain the steps involved in evaluating patients with hypoxia and cyanosis, including history taking, physical examination, and diagnostic tests.	C2	MK	Lecture, Small group discussion	Tutorials, Group projects	OSCE, Practical examination	Pulmonology, Cardiology, Critical Care Medicine
HomU G-PM I.4.18		K	Define edema.	Define edema as the accumulation of excessive fluid in the interstitial spaces, leading to swelling and tissue enlargement.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Cardiology, Nephrology, Internal Medicine
HomU G-PM I.4.19		KH	Describe the pathophysiology of edema.	Explain the mechanisms involved in the development of edema, including changes in hydrostatic pressure, oncotic pressure, and capillary permeability.	C2	MK	Lecture, Small group discussion	Case studies, MCQs	LAQ, SAQ	Cardiology, Nephrology, Internal Medicine

HomU G-PM I.4.20			Discuss the causes and classification of edema.	Explain the various factors that can lead to edema, such as heart failure, kidney disease, liver cirrhosis, and venous insufficiency. Classify edema based on its location and underlying cause.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, SAQ, LAQ	Cardiology, Nephrology, Internal Medicine
HomU G-PM I.4.21			Describe the pathophysiology of edema.	Explain the mechanisms that lead to the accumulation of fluid in tissues, including increased capillary permeability and impaired lymphatic drainage.	C2	MK	Lecture, Small group discussion	Tutorials, Assignments	SAQ, LAQ	Cardiology, Nephrology, Internal Medicine
HomU G-PM I.4.22			Identify the clinical features of edema.	Describe the signs and symptoms associated with edema, including swelling, pitting, and changes in skin texture.	C2	MK	Lecture, Small group discussion	Presentations, Group projects, Assignments	SAQ, LAQ	Cardiology, Nephrology, Internal Medicine



HomU G-PM I.4.23		K	Define palpitations.	Define palpitations as the sensation of a rapid, irregular, or forceful heartbeat that may be felt in the chest, throat, or neck.	C1	MK	Lecture, Small group discussion	Quizzes	SAQ	Cardiology, Internal Medicine
HomU G-PM I.4.24		KH	Describe the pathophysiology of palpitations.	Explain the mechanisms that can lead to palpitations, including cardiac arrhythmias, structural heart disease, and stimulant use.	C2	MK	Lecture, Small group discussion	Assignments	SAQ, MCQs	Cardiology, Internal Medicine
HomU G-PM I.4.25			Discuss the common causes of palpitations.	Explain the various conditions and factors that can cause palpitations, such as atrial fibrillation, ventricular tachycardia, anxiety, and caffeine intake.	C2	MK	Lecture, Small group discussion	Tutorials, Assignments, MCQs	MCQs, Short-answer questions	Cardiology, Internal Medicine

HomU G-PM I.4.26			Identify the clinical features of palpitations.	Describe the signs and symptoms associated with palpitations, including palpitations at rest, palpitations with exertion, and associated dizziness or syncope.	C2	MK	Lecture, Small group discussion	Tutorials, Assignments, MCQs	MCQs, Short-answer questions	Cardiology, Internal Medicine
HomU G-PM I.4.27		K	Define the principles of homoeopathic management	Students should be able to define the basic principles of homoeopathic treatment	C1	MK	Lecture, Group discussion	Quiz, Assignments	SAQ	Homoeopathic Materia Medica
HomU G-PM I.4.28		KH	Describe the concept of the simillimum in homoeopathy	Students should be able to describe how the selection of the simillimum is based on the totality of symptoms in homoeopathic treatment	C2	MK	Lecture, Group discussion	Quiz, Assignments	SAQ	Homoeopathic Materia Medica
HomU G-PM I.4.29		SH	Demonstrate the process of selecting a homoeopathic remedy based	Students should be able to demonstrate how to select a homoeopathic remedy based on	C4	MK	Case studies	Quiz, Assignments	SAQ	Homoeopathic Materia Medica, Repertory

			on totality of symptoms	the totality of symptoms						
HomU G-PM I.4.30		KH	Explain the principles of case management in homoeopathy	Students should be able to discuss the principles of case management, including the importance of follow-up and potency selection	C5	MK	Lecture, Group discussion	Quiz, Assignments	LAQ	Homoeopathic Materia Medica

#### 6.1.5. Abdominal/GIT Dysfunctions

Sl.No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority -	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.5.1	K&S	KH	Describe the common causes of GIT dysfunctions.	Explain how factors such as diet, lifestyle, stress, and genetics can contribute to the development of GIT dysfunctions.	C2	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Pathology, Microbiology, PSM
HomU G-PM I.5.2			Discuss the pathophysiological mechanisms underlying GIT dysfunctions.	Explain how disturbances in gastrointestinal motility, secretion, and	C2	MK	Lecture, Small group discussion	Case studies, MCQ	LAQ, SAQ	Physiology, Pathology

				absorption can lead to symptoms of GIT dysfunctions.						
HomU G-PM I.5.3			Identify the risk factors associated with GIT dysfunctions.	Describe how factors such as age, gender, diet, and medication use can increase the risk of developing GIT dysfunctions.	C2	DK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Physiology, Pathology
HomU G-PM I.5.4			Explain the role of inflammation in GIT dysfunctions.	Describe how inflammatory processes can contribute to conditions such as gastritis, enteritis, and colitis.	C2	MK	Lecture, Small group discussion	MCQ, Assignments	SAQ	Pathology, Microbiology
HomU G-PM I.5.5			Discuss the role of the microbiome in GIT health.	Explain how alterations in the gut microbiome can impact GIT function and contribute to the development of GIT dysfunctions.	C2	DK	Lecture, Small group discussion	Tutorials, Group projects	LAQ, SAQ	Physiology, Pathology

HomU G-PM I.5.6			Describe the pathophysiology of dysphagia.	Explain how dysphagia can result from structural abnormalities, neurological disorders, or muscular dysfunction.	C2	MK	Lecture, Small group discussion	Quizzes, Peer assessment	LAQ, SAQ	Physiology, Pathology
HomU G-PM I.5.7			Discuss the common causes of dysphagia.	Explain how conditions such as esophageal strictures, achalasia, and neurological diseases can lead to dysphagia.	C2	MK	Lecture, Small group discussion	Case studies	SSQ	Pathology
HomU G-PM I.5.8			Identify the key symptoms and clinical features of dysphagia.	Describe how symptoms such as difficulty swallowing, pain with swallowing, and regurgitation can help diagnose dysphagia.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Clinical medicine

HomU G-PM I.5.9	HO		Discuss the role of homoeopathic remedies in the management of dysphagia.	Explain how remedies such as Lachesis, Phosphorus, and Belladonna can be used to treat symptoms of dysphagia.	C2	MK	Lecture, Small group discussion	Assignments	MCQs, Short-answer questions	Homoeopathic Materia Medica
HomU G-PM I.5.11			Describe the pathophysiology of nausea and vomiting.	Explain how various triggers, such as chemical stimulation, sensory input, and central nervous system disorders, can lead to nausea and vomiting.	C2	MK	Lecture, Small group discussion	Quizzes, Peer assessment	MCQs, Short-answer questions	Physiology, Pathology
HomU G-PM I.5.12			Discuss the common causes of nausea and vomiting.	Explain how conditions such as gastroenteritis, motion sickness, and pregnancy can cause nausea and vomiting.	C2	MK	Lecture, Small group discussion	Case studies	MCQs, Short-answer questions	Physiology, Pathology

HomU G-PM I.5.13			Identify the key symptoms and clinical features of nausea and vomiting.	Describe how symptoms such as retching, hypersalivation, and pallor can help diagnose nausea and vomiting.	C2	MK	Lecture, Small group discussion	Case studies	MCQs, Short-answer questions	Clinical medicine
HomU G-PM I.5.14	HO		Discuss the role of homoeopathic remedies in the management of nausea and vomiting.	Explain how remedies such as Ipecacuanha, Nux vomica, and Cocculus indicus can be used to treat symptoms of nausea and vomiting.	C2	MK	Lecture, Small group discussion	Observations, Assignments	MCQs, Short-answer questions	Homoeopathic Materia Medica
HomU G-PM I.5.15	K&S		Describe the importance of hydration and dietary modifications in the management of nausea and vomiting.	Explain how maintaining hydration and following a bland diet can help alleviate symptoms of nausea and vomiting.	C2	DK	Lecture, Small group discussion	Tutorials, Group projects	MCQs, Short-answer questions	Physiology

HomU G-PM I.5.16			Define diarrhea and its characteristics.	Define diarrhea as the passage of loose or watery stools three or more times a day, often accompanied by abdominal cramping, bloating, and urgency.	C1	MK	Lecture, Small group discussion	MCQ	SAQ	Physiology
HomU G-PM I.5.17			Describe the pathophysiology of diarrhea.	Explain how disturbances in gastrointestinal motility, secretion, and absorption can lead to diarrhea.	C2	MK	Lecture, Small group discussion	MCQ, Assignments	LAQ, SAQ	Physiology. Pathology
HomU G-PM I.5.18			Discuss the common causes of diarrhea.	Explain how infections, dietary factors, medications, and stress can contribute to the development of diarrhea.	C2	MK	Lecture, Small group discussion	Case studies	SAQ	Pathology, Microbiology
HomU G-PM I.5.19			Identify the key symptoms and clinical features of diarrhea.	Describe how symptoms such as loose stools, abdominal cramping, and	C2	MK	Lecture, Small group	SAQ, LAQ	LAQ, SAQ	Clinical medicine



				dehydration can help diagnose diarrhea.			discussion			
HomU G-PM I.5.20	HO		Discuss the role of homoeopathic remedies in the management of diarrhea.	Explain how remedies such as Podophyllum, Arsenicum album, and Chamomilla can be used to treat symptoms of diarrhea.	C2	MK	Lecture, Small group discussion	Assignments, MCQ	MCQs, Short-answer questions	Homoeopathic Materia Medica
HomU G-PM I.5.21	K&S		Describe the importance of fluid and electrolyte management in the management of diarrhea.	Explain how maintaining hydration and electrolyte balance is crucial in the treatment of diarrhea.	C2	MK	Lecture, Small group discussion	Tutorials, Group projects	LAQ, SAQ	Physiology
HomU G-PM I.5.22			Define constipation and its characteristics.	Define constipation as infrequent bowel movements or difficulty passing stools, often associated with hard, dry stools and straining.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Physiology

HomU G-PM I.5.23			Describe the pathophysiology of constipation.	Explain how factors such as slow colonic transit, pelvic floor dysfunction, and lifestyle factors can contribute to constipation.	C2	MK	Lecture, Small group discussion	Tutorials, Group projects	LAQ, SAQ	Physiology
HomU G-PM I.5.24			Discuss the common causes of constipation.	Explain how factors such as inadequate dietary fiber, dehydration, sedentary lifestyle, and certain medications can cause constipation.	C2	MK	Lecture, Small group discussion	Tutorials, Assignments	MCQs, Short-answer questions	Physiology
HomU G-PM I.5.25			Identify the key symptoms and clinical features of constipation.	Describe how symptoms such as straining, lumpy or hard stools, and a feeling of incomplete evacuation can help diagnose constipation.	C2	MK	Lecture, Small group discussion	MCQ, Assignments	MCQs, Short-answer questions	Clinical medicine

HomU G-PM I.5.26	HO		Discuss the role of homoeopathic remedies in the management of constipation.	Explain how remedies such as Bryonia, Nuxvomica, and Lycopodium can be used to treat symptoms of constipation.	C2	MK	Lecture, Small group discussion	Observations	MCQs, Short-answer questions	Homoeopathic Materia Medica
HomU G-PM I.5.27	K&S		Describe the importance of lifestyle modifications in the management of constipation.	Explain how dietary changes, increased physical activity, and regular bowel habits can help alleviate constipation.	C2	DK	Lecture, Small group discussion	Tutorials, Assignments	LAQ, SAQ	Physiology
HomU G-PM I.5.28			Define dysentery and its characteristics.	Define dysentery as a type of diarrhea that contains blood or mucus, often accompanied by abdominal pain and fever.	C2	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Physiology
HomU G-PM I.5.29			Describe the pathophysiology of dysentery.	Explain how infections, particularly bacterial and parasitic, can lead to	C2	MK	Lecture, Small group discussion	Tutorials, Assignments	LAQ, SAQ	Pathology

				inflammation of the intestines and the characteristic symptoms of dysentery.						
HomU G-PM I.5.30			Discuss the common causes of dysentery.	Explain how pathogens such as Shigella, Salmonella, and Entamoeba histolytica can cause dysentery.	C2	MK	Lecture, Small group discussion	Case studies	SAQ	Pathology
HomU G-PM I.5.31			Identify the key symptoms and clinical features of dysentery.	Describe how symptoms such as bloody diarrhea, abdominal cramps, and tenesmus can help diagnose dysentery.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Clinical medicine
HomU G-PM I.5.32	HO		Discuss the role of homoeopathic remedies in the management of dysentery.	Explain how remedies such as Merc sol, Aloe socotrina, and Podophyllum can be used to treat symptoms of dysentery.	C2	MK	Lecture, Small group discussion	Observations	MCQs, Short-answer questions	Homoeopathic Materia Medica

HomU G-PM I.5.33	K&S		Describe the importance of hydration and electrolyte management in the management of dysentery.	Explain how maintaining hydration and electrolyte balance is crucial in the treatment of dysentery.	C2	MK	Lecture, Small group discussion	Tutorials, Assignments	LAQ, SAQ	Physiology
HomU G-PM I.5.34			Define unintentional weight loss and its significance.	Define unintentional weight loss as a decrease in body weight that occurs without purposeful dieting or exercise, often indicating an underlying health issue.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Physiology
HomU G-PM I.5.35			Describe the pathophysiology of unintentional weight loss.	Explain how various factors, such as increased metabolism, reduced nutrient absorption, and chronic inflammation, can lead to unintentional weight loss.	C2	MK	Lecture, Small group discussion	Tutorials, Assignments	LAQ, SAQ, MCQ	Physiology

HomU G-PM I.5.36			Discuss the common causes of unintentional weight loss.	Explain how conditions such as cancer, gastrointestinal disorders, hyperthyroidism, and depression can cause unintentional weight loss.	C2	MK	Lecture, Small group discussion	Case studies	SAQ	Physiology, Pathology
HomU G-PM I.5.37			Identify the key symptoms and clinical features associated with unintentional weight loss.	Describe how symptoms such as fatigue, weakness, and changes in appetite can help diagnose unintentional weight loss.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Clinical medicine
HomU G-PM I.5.38	HO		Discuss the role of homoeopathic remedies in the management of unintentional weight loss.	Explain how remedies such as Calcarea carbonica, Natrum muriaticum, and Phosphorus can be used to address underlying causes of unintentional weight loss.	C2	MK	Lecture, Small group discussion	Assignments	MCQs, Short-answer questions	Homoeopathic Materia Medica

HomU G-PM I.5.39	K&S		Describe the importance of a comprehensive evaluation in the management of unintentional weight loss.	Explain how assessing medical history, conducting physical examinations, and performing diagnostic tests are essential in identifying the cause of unintentional weight loss.	C2	DK	Lecture, Small group discussion	Tutorials, Assignments	LAQ, SAQ	Clinical medicine
HomU G-PM I.5.40			Describe the pathophysiology of gastrointestinal bleeding	Explain the mechanisms by which various conditions, such as peptic ulcers, esophageal varices, and inflammatory bowel disease, can lead to GI bleeding.	C2	MK	Lecture, Small group discussion	Tutorials, Assignments	LAQ, SAQ	Pathology
HomU G-PM I.5.41			Discuss the risk factors associated with GI bleeding	Identify and explain the risk factors, such as NSAID use, alcohol consumption, and coagulopathy,	C2	MK	Lecture, Small group discussion	Case studies	MCQs, Short-answer questions	Physiology, Pathology

				that can predispose individuals to GI bleeding.						
HomU G-PM I.5.42			Explain the clinical presentation of GI bleeding	Describe the signs and symptoms, such as hematemesis, melena, and hematochezia, that are indicative of GI bleeding.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Clinical medicine
HomU G-PM I.5.43	HO		Describe the common homoeopathic remedies used in the management of GI bleeding	Explain the indications for remedies such as Phosphorus, Hamamelis, and Ferrummetallicum in treating various causes of GI bleeding.	C2	MK	Lecture, Small group discussion	Case studies	MCQs, Short-answer questions	Homoeopathic Tertia Medica
HomU G-PM I.5.44			Explain the concept of miasmatic prescribing in homeopathy	Describe how miasmatic factors are considered in chronic cases of GI bleeding for long-term management.	C2	DK	Lecture, Small group discussion	Observations, Simulations	SAQ	Organon



HomU G-PM I.5.45			Define jaundice and its clinical significance	Define jaundice as the yellow discoloration of the skin and mucous membranes due to elevated bilirubin levels and explain its importance in clinical diagnosis.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Physiology, Pathology
HomU G-PM I.5.46			Describe the pathophysiology of jaundice	Explain the mechanisms of hyperbilirubinaemia, including hemolysis, hepatocellular dysfunction, and biliary obstruction, leading to jaundice.	C2	MK	Lecture, Small group discussion	Case studies, Role-playing	LAQ, SAQ	Physiology, Surgery
HomU G-PM I.5.47			Discuss the causes of jaundice	Identify and explain the various etiologies of jaundice, including viral hepatitis, alcoholic liver disease, and biliary tract obstruction.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Physiology, Surgery

HomU G-PM I.5.48			Explain the clinical features of jaundice	Describe the signs and symptoms of jaundice, such as yellowing of the skin, dark urine, and pale stools, and their significance in diagnosis.	C2	MK	Lecture, Small group discussion	Observations, Simulations	MCQs, Short-answer questions	Clinical medicine
HomU G-PM I.5.49	HO		Describe the common homoeopathic remedies used in the management of jaundice	Explain the indications for remedies such as Chelidonium, Lycopodium, and Natrum sulphuricum in treating jaundice.	C2	MK	Lecture, Small group discussion	Case studies, Role-playing	MCQs, Short-answer questions	Homoeopathic Tertia Medica
HomU G-PM I.5.50	K&S		Define ascites and its clinical significance	Define ascites as the abnormal accumulation of fluid in the peritoneal cavity and its importance in clinical diagnosis.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Anatomy, Physiology

HomU G-PM I.5.51			Describe the pathophysiology of ascites	Explain the mechanisms of fluid accumulation in ascites, including portal hypertension, hypoalbuminemia, and lymphatic obstruction.	C2	MK	Lecture, Small group discussion	Case studies, Role-playing	LAQ, SAQ	Physiology, Pathology
HomU G-PM I.5.52			Discuss the causes of ascites	Identify the various etiologies of ascites, including liver cirrhosis, heart failure, and malignancy.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Pathology
HomU G-PM I.5.53			Explain the clinical features of ascites	Describe the signs and symptoms of ascites, such as abdominal distension and shifting dullness, and their significance in diagnosis.	C2	MK	Lecture, Small group discussion	Observations, Simulations	LAQ, SAQ	Surgery, Clinical Medicine

HomU G-PM I.5.54			Differentiate between transudative and exudative ascites	Define transudative and exudative ascites and the pathophysiological differences between them.	C1	MK	Lecture, Small group discussion	Quizzes, Peer assessment	SAQ	Pathology
HomU G-PM I.5.55			Discuss the classification of ascites based on the underlying cause	Explain the categorization of ascites as cirrhotic, cardiac, malignant, and tuberculous based on the underlying disease process.	C2	MK	Lecture, Small group discussion	#NAME?	MCQs, Short-answer questions	Pathology
HomU G-PM I.5.56			Describe the grading of ascites based on severity	Explain the use of imaging modalities, such as ultrasound, in grading ascites from mild to severe based on fluid accumulation.	C2	MK	Lecture, Small group discussion	Problem-based learning	MCQs, Short-answer questions	Pathology, Surgery
HomU G-PM I.5.57			Explain the role of ascitic fluid analysis in diagnosis	Describe the use of ascitic fluid analysis, including cell count, albumin gradient, and	C2	MK	Lecture, Small group discussion	Presentations, Group projects	SAQ	Physiology, Laboratory Medicine

				culture, in diagnosing the cause of ascites.						
HomU G-PM I.5.58	HO		Describe the common homoeopathic remedies used in the management of ascites	Explain the indications for remedies such as Apis mellifica, Lycopodium, and Carduus marianus in treating ascites.	C2	MK	Lecture, Small group discussi on	Case studies,	MCQs, Short- answer questions	Homoeopathic Materia Medica

#### 6.1.6. Renal and Urinary Tract Dysfunctions

Sl. No.	Domain of Compet ency	Millers Level	Content	SLO	Blooms Domai n/ Guilbe rt's Level	Priori ty	T-L Metho ds	Assessment		Integration
								F	S	
HomU G-PM I.6.1	K&S	K	Define the terms "renal dysfunction" and "urinary tract dysfunction"	Students should be able to define these terms and differentiate between dysfunction of the kidneys and the urinary tract	C1	MK	Lecture , Group discuss ion	MCQ, Written test	SAQ	Anatomy, Pathology

HomU G-PM I.6.2			Identify the various causes of renal dysfunction	Students should be able to list the factors that can lead to dysfunction of the kidneys	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ	Medicine, Pathology
HomU G-PM I.6.3			Identify the various causes of urinary tract dysfunction	Students should be able to list the factors that can lead to dysfunction of the urinary tract	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ	Medicine, Pathology
HomU G-PM I.6.4		KH	Describe the underlying pathophysiology of renal dysfunction	Students should be able to describe the pathophysiological processes involved in renal dysfunction	C2	NK	Lecture , Group discussion	MCQ, Written test	SAQ	Physiology, Pathology
HomU G-PM I.6.5		K	Define the terms "cystitis" and "bladder pain syndrome"	Students should be able to define these terms and differentiate between them	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Pathology, Surgery
HomU G-PM I.6.6			Describe the symptoms and clinical presentation of cystitis/bladder pain syndrome	Students should be able to list the common symptoms associated with cystitis and bladder pain syndrome	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Surgery, Urology

HomU G-PM I.6.7	HO	KH	Discuss the causes and risk factors associated with cystitis/bladder pain syndrome	Students should be able to discuss the various factors that can lead to the development of cystitis and bladder pain syndrome	C2	NK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Pathology, Urology
HomU G-PM I.6.8			Describe the principles of homoeopathic management for cystitis/bladder pain syndrome	Students should be able to describe the basic principles of homoeopathic treatment for cystitis and bladder pain syndrome	C2	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica
HomU G-PM I.6.9		SH	Demonstrate the process of selecting a homoeopathic remedy for cystitis/bladder pain syndrome based on the totality of symptoms	Students should be able to demonstrate how to select a homoeopathic remedy for a case of cystitis/bladder pain syndrome	P2	MK	Role-playing , Simulation	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica

HomU G-PM I.6.10	K&S	K	Define the term "dysuria" and differentiate it from other urinary symptoms	Students should be able to define dysuria with its characteristic features	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology, Urology
HomU G-PM I.6.11			Describe the various causes of dysuria	Students should be able to list the factors that can lead to the development of dysuria	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Pathology, Urology
HomU G-PM I.6.12		KH	Explain the underlying pathophysiology of dysuria	Students should be able to explain the pathological processes that cause dysuria	C2	NK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology, Pathology
HomU G-PM I.6.13			Discuss the clinical features and presentation of dysuria	Students should be able to describe the common symptoms and signs associated with dysuria	C2	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Surgery, Pathology
HomU G-PM I.6.14	HO		Explain the principles of homoeopathic management for dysuria	Students should be able to describe the basic principles of homoeopathic treatment for dysuria	C2	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica



HomU G-PM I.6.15			Demonstrate the process of selecting a homoeopathic remedy for dysuria based on the totality of symptoms	Students should be able to demonstrate how to select a homoeopathic remedy for a case of dysuria	P2	MK	Role-playing , Simulation	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica
HomU G-PM I.6.16	K&S	K	Define the term "azotemia" and explain its significance	Students should be able to 1.defineazotemia and 2. understand its clinical implications	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology, Pathology, Nephrology
HomU G-PM I.6.17			Describe the various causes and mechanisms leading to the development of azotemia	Students should be able to list the factors that can lead to the development of azotemia	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Pathology, Nephrology
HomU G-PM I.6.18		KH	Explain the underlying pathophysiologic al processes involved in the development of azotemia	Students should be able to explain the pathological processes that lead to elevated blood urea nitrogen (BUN) and creatinine levels in azotemia	C2	NK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology, Pathology, Nephrology

HomU G-PM I.6.19			Discuss the clinical presentation and signs associated with azotemia	Students should be able to describe the common clinical manifestations of azotemia	C2	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Nephrology
HomU G-PM I.6.20			Discuss the diagnostic tests and procedures used to evaluate and diagnose azotemia	Students should be able to discuss the clinical investigations used to evaluate azotemia	C2	NK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Laboratory Medicine, Nephrology
HomU G-PM I.6.21	HO		Explain the principles of homoeopathic management for azotemia	Students should be able to describe the basic principles of homoeopathic treatment for azotemia	C2	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica
HomU G-PM I.6.22			Demonstrate the process of selecting a homoeopathic remedy for azotemia based on the totality of symptoms	Students should be able to demonstrate how to select a homoeopathic remedy for a case of azotemia	P2	MK	Role-playing , Simulation	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica
KHom UG-PM I.6.23		K	Define the terms "fluid imbalance" and "electrolyte imbalance"	Students should be able to define these terms	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology

HomU G-PM I.6.24			Describe the various causes and factors contributing to fluid and electrolyte imbalances	Students should be able to list the factors that lead to the development of fluid and electrolyte imbalances	C1	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Medicine, Physiology
HomU G-PM I.6.25		KH	Explain the underlying pathophysiological processes involved in the development of fluid and electrolyte imbalances	Students should be able to explain the pathological mechanisms that lead to fluid and electrolyte imbalance	C2	NK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology, Pathology
HomU G-PM I.6.26			Discuss the clinical signs and symptoms associated with fluid and electrolyte imbalances	Students should be able to describe the common clinical manifestations seen in patients with fluid and electrolyte imbalances	C2	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology
HomU G-PM I.6.27			Identify the various risk factors that predispose individuals to the development of	Students should be able to discuss the factors that influence the fluid and	C2	NK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Physiology, Pathology

			fluid and electrolyte imbalances	electrolyte imbalances						
HomU G-PM I.6.28	HO		Explain the principles of homoeopathic management for fluid and electrolyte imbalances	Students should be able to describe the basic principles of homoeopathic treatment for fluid and electrolyte imbalances	C2	MK	Lecture , Group discussion	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica
HomU G-PM I.6.29			Demonstrate the process of selecting a homoeopathic remedy for fluid and electrolyte imbalance based on symptoms	Students should be able to demonstrate how to select a homoeopathic remedy in case of fluid and electrolyte imbalance	P2	MK	Role-playing , Simulation	MCQ, Written test	SAQ, MCQ	Homoeopathic Materia Medica
HomU G-PM I.6.30	K&S		Discuss the impact of lifestyle factors such as diet and fluid intake on fluid and electrolyte balance	Students should be able to discuss how lifestyle changes can help manage fluid and electrolyte imbalances	C2	NK	Lecture , Group discussion	MCQ, Written test	LAQ, SAQ, MCQ	Nutrition, Lifestyle Medicine

### 6.1.7. Hematological alterations-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.7.1	K&S	K	Define the terminologies used.	Students should be able to define following hematological alterations with their characteristics	C1	MK	Lecture, Group discussion	Quiz, Written test	MCQ, SAQ	Physiology, Pathology
7.1a				1. Anemia,						
7.1a				2. Leukocytosis,						
7.1a				3. Leucopenia,						
7.1a				4. Bleeding diatheses						
HomU G-PM I.7.2		KH	Identify the various risk factors that predispose individuals to the development of hematological alterations	Students should be able to discuss the factors that increase the likelihood of developing the above hematological alterations	C2	MK	Lecture, Group discussion	Quiz, Written test	MCQ, SAQ	Physiology, Pathology

HomU G-PM I.7.3			Explain the underlying pathophysiological processes involved in the development of hematological alterations	Students should be able to explain the pathological mechanisms that lead to the following hematological disorders	C2	MK	Lecture, Group discussion	Quiz, Assignments, Written test	MCQ, SAQ	Physiology, Pathology
7.3a				1. Anemia,						
7.3a				2. Leukocytosis,						
7.3a				3. Leucopenia,						
7.3a				4. Bleeding diatheses						
HomU G-PM I.7.4			Discuss the common signs and symptoms associated with hematological alterations	Students should be able to describe the typical clinical manifestations observed in patients with following hematological disorders	C2	MK	Lecture, Group discussion	Quiz, Assignments, Written test	MCQ, LAQ, SAQ	Pathology, Hematology
7.4a				1. Anemia,						
7.4a				2. Leukocytosis,						
7.4a				3. Leucopenia,						
7.4a				4. Bleeding diatheses						

HomU G-PM I.7.5			Discuss the diagnostic tests and procedures used to evaluate and diagnose hematological alterations	Students should be able to discuss the various tests and procedures used to evaluate hematological disorders	C2	MK	Lecture, Group discussion	Quiz, Assignments, Written test	MCQ, SAQ	Pathology, Laboratory Medicine, Hematology
HomU G-PM I.7.6			Explain the principles of homoeopathic management for hematological alterations	Students should be able to describe the basic principles of homoeopathic treatment for hematological disorders	C2	MK	Lecture, Group discussion	Quiz, Assignments, Written test	SAQ	Organon of Medicine
HomU G-PM I.7.7			Explain how homoeopathic remedies are selected for hematological alterations	Students should be able to explain the process of selection homoeopathic remedies for hematological alterations	C2	MK	Lecture, Group discussion	Quiz, Assignments, Written test	SAQ	Organon, Materia medica
HomU G-PM I.7.8		SH	Demonstrate the process of selecting a homoeopathic remedy for hematological alterations based on symptoms	Students should be able to demonstrate how to select a homoeopathic remedy for a case of hematological dysfunction	P2	MK	Group Discussion, Case study	Assignments	SAQ	Organon, Materia medica

### 6.1.8. Psychological symptoms-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain / Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.8.1	K&S	K	Define the terms "psychological symptoms" and explain their relevance	1. Psychological disorders are patterns of behavioral or psychological symptoms that impact multiple areas of life. 2. These disorders create distress for the person experiencing the symptoms. 3. They can be temporary or lifelong, and affect how you think, feel, and behave	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.2			Define the term "fatigue" and explain its relevance	Define fatigue and its significance	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Medicine
HomU G-PM I.8.3			Describe the various factors and conditions that can lead to fatigue	List the factors that can contribute to the onset of fatigue	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Medicine



HomU G-PM I.8.4		KH	Explain the underlying physiological processes involved in the development of fatigue	Explain the physiological mechanisms that underlie the manifestation of fatigue	C2	NK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Medicine
HomU G-PM I.8.5		K	Define the term "asthenia"	Define asthenia and its significance	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Medicine
HomU G-PM I.8.6			Describe the various factors and conditions that can lead to asthenia	List the factors that can contribute to the onset of asthenia	C2	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Medicine
HomU G-PM I.8.7		KH	Explain the underlying physiological processes involved in the development of asthenia	Explain the physiological mechanisms that underlie the manifestation of asthenia	C2	NK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Medicine
HomU G-PM I.8.8		K	Define the term "anxiety"	Define anxiety and its significance	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.9			Describe the various factors and conditions that can lead to anxiety	List the factors that can contribute to the onset of anxiety	C2	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology

HomU G-PM I.8.10		KH	Explain the underlying physiological processes involved in the development of anxiety	Explain the physiological mechanisms that underlie the manifestation of anxiety	C2	NK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Psyc
HomU G-PM I.8.11		K	Define the term "sadness"	Define sadness and its significance	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.12		KH	Describe the various factors and conditions that can lead to sadness	List the factors that can contribute to the onset of sadness	C2	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.13		K	Define the term "disorders of thought" and explain its relevance	Define disorders of thought and understand their significance	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.14		KH	Describe the various factors and conditions that can lead to disorders of thought	List the factors that can contribute to the onset of disorders of thought	C2	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.15		K	Define the term "disorders of perception" and explain its relevance	Define disorders of perception and their significance	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology

HomU G-PM I.8.16		KH	Describe the various factors and conditions that can lead to disorders of perception	List the factors that can contribute to the onset of disorders of perception	C2	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.17		K	Define the term "sleep disorders" and explain its relevance	Define sleep disorders.	C1	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.18		KH	Describe the various factors and conditions that can lead to sleep disorders	List the factors that can contribute to the onset of sleep disorders	C2	MK	Lecture , Group discussion	Quiz, Written test	SAQ	Psychiatry, Psychology
HomU G-PM I.8.19			Explain the underlying physiological processes involved in the development of sleep disorders	Explain the physiological mechanisms that underlie the manifestation of sleep disorders	C2	NK	Lecture , Group discussion	Quiz, Written test	SAQ	Physiology, Psychiatry

## 6.2. Competency tables for immunity and susceptibility – general considerations

### 6.2.1. Introduction and primary & secondary immunodeficiency states-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.9.1	K&S	K	Explanation of primary and secondary immunodeficiency states	Understanding the difference between primary and secondary immunodeficiency	C1	MK	Lecture, Discussion	Quizzes, Written test	SAQ	Physiology, Pathology, Microbiology
HomU G-PM I.9.2			Overview of common genetic and acquired causes	Recognition of common primary immunodeficiency disorders	C2	MK	Cases, Group work	Quizzes, Written test	MCQ, SAQ	Pathology, Microbiology
HomU G-PM I.9.3		KH	Description of clinical signs and symptoms	Identification of clinical features suggestive of immunodeficiency	C2	MK	Group Discussion, Assignments	Quizzes, Written test, Tutorials	MCQ, SAQ	Pathology, Microbiology
HomU G-PM I.9.4			Description of therapeutic interventions and preventive measures	Demonstration of appropriate management plans for immunodeficiency disorders	C3	DK	Debates	Tutorials	SAQ	Pathology, Microbiology

**6.2.2. Hypersensitivity reactions: I,II,III,IV-**

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.10.1	K&S	K	Explanation of hypersensitivity reaction types	Understanding the classification and mechanisms of hypersensitivity reactions	C1	MK	Lecture, Discussion	MCQ	SAQ	Pathology, Microbiology
01a				Type I hypersensitivity reactions						
01b				Type II hypersensitivity reactions						
01c				Type III hypersensitivity reactions						
01d				Type IV hypersensitivity reactions						
HomU G-PM I.10.2			Overview of common allergens and mediators such as IgE, histamine, and cytokines	Recognition of allergens and mediators associated with type I hypersensitivity	C2	MK	Group discussion	Assignments, MCQ	SAQ	Pathology, Microbiology

HomU G-PM I.10.3		KH	Explanation of IgE-mediated mast cell degranulation	Understanding the sequence of events leading to type I hypersensitivity reactions	C2	NK	Lecture, Group Discussion	Assignments, MCQ	SAQ	Physiology, Pathology
HomU G-PM I.10.4			Description of allergic rhinitis, asthma, anaphylaxis, and atopic dermatitis	Identification of clinical features suggestive of type I hypersensitivity	C2	MK	Lectures, Group discussion	MCQ	SAQ, Bedside examination	Physiology, Pathology, Clinical medicine
HomU G-PM I.10.5			Explanation of skin prick tests and serum IgE assays	Application of diagnostic strategies for type I hypersensitivity assessment	C2	DK	Debates	Tutorials	SAQ	Physiology, Pathology, Clinical medicine
HomU G-PM I.10.6		K	Overview of common antigens and antibodies such as blood group antigens and autoantibodies	Identify common antigens and antibodies involved in type II hypersensitivity reactions	C1	MK	Lecture	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology
HomU G-PM I.10.7		KH	Explanation of antibody-mediated cell destruction and complement activation	Understanding the sequence of events leading to type II hypersensitivity reactions	C2	MK	Lecture	Assignments, MCQ	SAQ	Physiology, Pathology

HomU G-PM I.10.8			Description of autoimmune hemolytic anemia, Goodpasture syndrome, and hemolytic disease of the newborn	Identification of clinical features suggestive of type II hypersensitivity	C2	MK	Lecture, case based learning	Assignments, MCQ	SAQ, Viva voce	Pathology, clinical medicine
HomU G-PM I.10.9			Explanation of direct and indirect Coombs tests	Application of diagnostic strategies for type II hypersensitivity assessment	C2	DK	Debates	Tutorials	SAQ, Viva voce	Physiology, pathology
HomU G-PM I.10.10		K	Overview of common antigens and antibodies such as immune complexes and autoantibodies	Identify common antigens and antibodies involved in type III hypersensitivity reactions	C1	MK	Lecture	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology
HomU G-PM I.10.11		KH	Explanation of immune complex deposition and complement activation	Understanding the sequence of events leading to type III hypersensitivity reactions	C2	MK	Lecture	Assignments, MCQ	SAQ	Physiology, Pathology

HomU G-PM I.10.12			Description of serum sickness, Arthus reaction, and systemic lupus erythematosus	Identification of clinical features suggestive of type III hypersensitivity	C2	MK	Lecture, case based learning	Assignments, MCQ	SAQ, Viva voce	Pathology, clinical medicine
HomU G-PM I.10.13			Explanation of laboratory tests such as complement levels and immunofluorescence	Application of diagnostic strategies for type III hypersensitivity assessment	C2	DK	Debates	Tutorials	SAQ, Viva voce	Physiology, pathology
HomU G-PM I.10.14		K	Overview of common antigens and cells such as haptens and T cells	Identify common antigens and cells involved in type IV hypersensitivity reactions	C1	MK	Lecture	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology
HomU G-PM I.10.15		KH	Explanation of T cell-mediated inflammation and cytokine release	Understanding the sequence of events leading to type IV hypersensitivity reactions	C2	MK	Lecture	Assignments, MCQ	SAQ	Physiology, Pathology
HomU G-PM I.10.16			Description of contact dermatitis, tuberculin reaction, and	Identification of clinical features suggestive of type IV	C2	MK	Lecture, case based	Assignments, MCQ	SAQ, Viva voce	Pathology, clinical medicine



			autoimmune diseases	hypersensitivity			learning			
HomU G-PM I.10.17			Explanation of patch testing and lymphocyte proliferation assays	Application of diagnostic strategies for type IV hypersensitivity assessment	C2	DK	Debates	Tutorials	SAQ, Viva voce	Physiology, pathology

### 6.2.3. Autoimmune Diseases-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.11.1	K&S	K	Explanation of autoimmune disease etiology and pathogenesis	Understanding the basics of autoimmune diseases and their mechanisms	C1	MK	Lecture, Discussion	MCQ	SAQ	Pathology, Microbiology
HomU G-PM I.11.2			Overview of common autoimmune disorders such as rheumatoid arthritis, systemic lupus erythematosus, and multiple sclerosis	Recognition of autoimmune diseases and their clinical presentations	C1	MK	Lecture, Discussion	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology, Clinical medicine

HomU G-PM I.11.3		KH	Explanation of immune dysregulation in autoimmune disorders	Understanding the involvement of autoantibodies and T cells in autoimmune pathophysiology	C2	MK	Problem-based learning	Tutorials, MCQ	SAQ, Viva voce	Physiology, pathology
HomU G-PM I.11.4			Description of systemic symptoms and organ involvement in autoimmune disorders	Identification of systemic and organ-specific manifestations of autoimmune diseases	C2	MK	Lecture, Discussion	Tutorials, MCQ	SAQ, Viva voce	Pathology, Clinical medicine

#### 6.2.4. HIV Disease-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.12.1	K&S	K	Explanation of HIV virus and its transmission	Understanding the basics of HIV/AIDS and its causative agent	C1	MK	Lecture, Group Discussion	MCQ	SAQ	Pathology, Microbiology

HomU G-PM I.12.2			Overview of HIV transmission routes such as sexual contact, blood exposure, and vertical transmission	Identify common risk factors and modes of transmission for HIV infection	C1	MK	Lecture, Group Discussion	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology, PSM
HomU G-PM I.12.3		KH	Explanation of HIV progression from acute infection to AIDS	Understanding the stages and clinical course of HIV disease	C2	MK	Lectures, case based learning	Tutorials, Assignments, MCQ	SAQ, Viva voce	Clinical medicine
HomU G-PM I.12.4			Description of HIV-related symptoms and AIDS-defining illnesses	Identification of clinical features suggestive of HIV infection and AIDS	C2	MK	Workshops, Case-based learning	Assignments, MCQ	SAQ, Viva voce	Clinical medicine
HomU G-PM I.12.5			Explanation of HIV replication and immune depletion	Understand the pathophysiology of HIV infection and its effects on the immune system	C2	DK	Lectures, Group Discussion	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology
HomU G-PM I.12.6		SH	Description of HIV prevention methods and harm reduction approaches	Demonstration of appropriate prevention strategies for HIV infection	P2	DK	Seminars	Tutorials, Assignments, MCQ	SAQ, Viva voce	Community outreach programs on HIV prevention

### 6.2.5. Transplants and graft rejection-

Sl. No	Domain of Competency	Millers Level	Content	SLO	Blooms Domain / Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.13.1	K&S	K	Explanation of transplantation and immune response against grafts	Understanding the basics of transplantation and graft rejection	C1	MK	Lecture, Group Discussion	MCQ	SAQ	Pathology, Microbiology
HomU G-PM I.13.2			Overview of different types of transplants and their sources	Recognition of various transplantation methods and their differences	C1	MK	Lecture, Group Discussion	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology
HomU G-PM I.13.3		KH	Explanation of the alloimmune response and mechanisms of graft rejection	Understanding the immune-mediated rejection process	C2	MK	Lectures, case based learning	Tutorials, Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology
HomU G-PM I.13.4			Description of acute and chronic rejection symptoms	Identification of clinical features suggestive of graft rejection	C2	MK	Workshops, Case-based learning	Assignments, MCQ	SAQ, Viva voce	Pathology, Microbiology

### 6.2.6. Homoeopathic relation of immunity and susceptibility-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert 's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.14.1	K&S	K	Overview of factors such as genetic predisposition, miasmatic influence, and constitutional characteristics	Recognition of factors influencing individual's susceptibility according to homeopathic principles	C2	MK	Lecture, Group Discussion	Case presentations, MCQ	SAQ, Viva voce	Organon and Hom. Philosophy
HomU G-PM I.14.3		KH	Description of the individualized approach in homeopathy	Identification of the importance of individualization in homeopathic treatment based on susceptibility	C2	MK	Lectures, Case-based learning	Quiz competitions, Tutorials	SAQ, Bedside examination	Organon and Hom. Philosophy
HomU G-PM I.14.4			Explanation of homeopathic remedies and constitutional treatment for improving vitality	Explain the role of homeopathic treatment strategies in enhancing immunity	C2	DK	Problem-solving scenarios, Group discussions	Case presentation, Guided discussions	Viva voce	Organon and Hom. Philosophy

HomU G-PM I.14.5			Description of the principle of similars and its role in strengthening immunity	Discuss the concept of the similimum in homeopathy and its relation to immunity and susceptibility	C2	DK	Group Discussions	Tutorials, Assignments		Organon and Hom. Philosophy
HomU G-PM I.14.6		SH	Analysis of patient outcomes and changes in susceptibility following homeopathic treatment	Evaluation of the effectiveness of homeopathic interventions on immunity	P1	DK	Patient encounters - OPD		Objective Structured Clinical Examination (OSCE)	Organon and Hom. Philosophy

### 6.3.Competency tables for medical genetics – an introduction

#### 6.3.1. Introduction-

Sl. No.	Domain of Competency	Miller's Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomUG -PM I.15.1	K&S	K	Explanation of medical genetics and its scope	Understanding the definition and scope of medical genetics	C1	MK	Lecture, Discussion	MCQ	SAQ	Physiology, Biochemistry ,
HomUG -PM I.15.2			Overview of Mendelian principles, non-Mendelian inheritance, and genetic variation	Identify the basic principles of inheritance	C2	MK	Lecture, Discussion	MCQ, Assignemnts	Viva voce	Physiology, Pathology
HomUG -PM I.15.3		KH	Explanation of DNA structure, gene expression, and regulation	Describe the structure and function of DNA and genes	C2	MK	Problem-based learning	Assignments , MCQ	SAQ ,	Physiology, Biochemistry

HomUG -PM I.15.4			Description of inheritance patterns (autosomal dominant, autosomal recessive, X-linked, etc.) and common genetic disorders	Describe the patterns of inheritance and genetic disorders	C2	MK	Interactive workshops , Case-based learning	MCQ, Assignments	SAQ	Pathology, Clinical medicine
HomUG -PM I.15.5			Explanation of genetic testing methods, indications, and implications	Application of genetic counseling principles	C3	DK	Problem-solving scenarios, Group Discussion	Tutorials, MCQ	SAQ , Viva voce	Biochemistry , Clinical Medicine
HomUG -PM I.15.6		Shows how	Description of ELSI (ethical, legal, and social implications ) issues in clinical practice	Demonstration of understanding ELSI principles	P1	DK	Seminars	Tutorials, Assignments		Clinical Medicine, PSM



### 6.3.2. Cytogenetics-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert 's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.16.1	K&S	K	Explanation of cytogenetics and its role in studying chromosomes and their abnormalities	Understanding the definition and scope of cytogenetics	C1	MK	Lecture, Discussion	MCQ	SAQ	Pathology
HomU G-PM I.16.2			Overview of chromosome structure, function, and organization	Identify the basic structure and function of chromosomes	C1	MK	Lecture, Discussion	MCQ, Assignemnts	Viva voce	Biochemistry, pathology
HomU G-PM I.16.3		KH	Explanation of cytogenetic techniques such as karyotyping, FISH, and chromosomal microarray	Understanding the principles and applications of cytogenetic methods	C2	MK	Lecture, Assgnments	Assignments, MCQ	SAQ,	Pathology

HomU G-PM I.16.4			Description of different types of chromosomal abnormalities (numerical and structural) and their subtypes (e.g., trisomy, translocation, deletion)	Identification and categorization of chromosomal abnormalities	C2	MK	Workshops, Case-based learning	MCQ, Assignments	SAQ	Pathology
HomU G-PM I.16.5			Explanation of inheritance patterns for chromosomal abnormalities (e.g., autosomal dominant, autosomal recessive, X-linked)	Recognize patterns of inheritance for chromosomal abnormalities	C2	MK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Physiology, Biochemistry, pathology

### 6.3.3. Down's Syndrome-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert 's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.17.1	K&S	K	Explanation of Down's Syndrome, its causes, and characteristics	Understanding the definition and basic features of Down's Syndrome	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology
HomU G-PM I.17.2		KH	Overview of trisomy 21 and the genetic mechanisms leading to Down's Syndrome	Describe the genetic basis of Down's Syndrome	C2	MK	Lecture, Discussion	MCQ, Assignemnts	SAQ, Viva voce	Pathology
HomU G-PM I.17.3		Knows how	Description of physical characteristics , developmental delays, and medical issues associated with Down's Syndrome	Identification of clinical features suggestive of Down's Syndrome	C3	MK	Lecture, Assgnments	Assignments, MCQ	SAQ, MCQ	Pathology, Paediatrics

HomU G-PM I.17.4		Knows how	Explanation of prevalence, risk factors, and screening methods for Down's Syndrome	Application of knowledge regarding Down's Syndrome epidemiology and risk assessment	C4	DK	Workshops	MCQ, Assignments	SAQ	Pathology, ObG, PSM, Paediatrics
HomU G-PM I.17.5		Shows how	Description of medical interventions, therapies, and support services for individuals with Down's Syndrome	Discuss the medical and developmental management of individuals with Down's Syndrome	C5	DK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Paediatrics

#### 6.3.4. Turner's Syndrome-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.18.1	K&S	K	Explanation of Turner's Syndrome, its causes, and characteristics	Understanding the definition and basic features of Turner's Syndrome	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology

HomU G-PM I.18.2		KH	Overview of monosomy X and the genetic mechanisms leading to Turner's Syndrome	Describe the genetic basis of Turner's Syndrome	C2	MK	Lecture, Discussion	MCQ, Assignemnts	SAQ, Viva voce	Pathology
HomU G-PM I.18.3			Description of physical characteristics, developmental issues, and medical conditions associated with Turner's Syndrome	Identification of clinical features suggestive of Turner's Syndrome	C3	MK	Lecture, Assignments	Assignments, MCQ	SAQ, MCQ	Pathology, Paediatrics
HomU G-PM I.18.4			Explanation of prevalence, risk factors, and screening methods for Turner's Syndrome	Understand the epidemiology and risk factors for Turner's Syndrome	C4	DK	Workshops	MCQ, Assignments	SAQ	Pathology, ObG, PSM, Paediatrics
HomU G-PM I.18.5			Description of medical interventions, hormone therapy, and support	Discuss the medical and developmental management of	C5	DK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Paediatrics

			services for individuals with Turner's Syndrome	individuals with Turner's Syndrome						
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### 6.3.5. Klinefelter's Syndrome-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert 's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.19.1	K&S	K	Explanation of Klinefelter's Syndrome, its causes, and characteristics	Understanding the definition and basic features of Klinefelter's Syndrome	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology
HomU G-PM I.19.2		KH	Overview of aneuploidy (47, XXY) and the genetic mechanisms leading to Klinefelter's Syndrome	Describe the genetic basis of Klinefelter's Syndrome	C2	MK	Lecture, Discussion	MCQ, Assignments	SAQ, Viva voce	Pathology

HomU G-PM I.19.3			Description of physical characteristics, developmental issues, and medical conditions associated with Klinefelter's Syndrome	Identification of clinical features suggestive of Klinefelter's Syndrome	C3	MK	Lecture, Assignments	Assignments, MCQ	SAQ, MCQ	Pathology , Paediatrics
HomU G-PM I.19.4			Explanation of prevalence, risk factors, and screening methods for Klinefelter's Syndrome	Understand the epidemiology and risk factors for Klinefelter's Syndrome	C4	DK	Workshops	MCQ, Assignments	SAQ	Pathology , ObG, PSM, Paediatrics
HomU G-PM I.19.5			Description of medical interventions, hormone therapy, and support services for individuals with Klinefelter's Syndrome	Discuss the medical and developmental management of individuals with Klinefelter's Syndrome	C5	DK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Paediatrics

### 6.3.6. Cystic Fibrosis-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.20.1	K&S	K	Explanation of CF, its causes, and characteristics	Understanding the definition and basic features of CF	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology
HomU G-PM I.20.2			Overview of mutations in the CFTR gene and their effects on chloride transport	Describe the genetic basis of CF	C1	MK	Lecture, Discussion	MCQ, Assignments	SAQ, Viva voce	Pathology
HomU G-PM I.20.3		KH	Description of respiratory, digestive, and other symptoms associated with CF	Identification of clinical features suggestive of CF	C2	MK	Lecture, Assignments	Assignments, MCQ	SAQ, MCQ	Pathology, Paediatrics
HomU G-PM I.20.4			Explanation of the mechanisms leading to mucus buildup and organ damage in CF	Understanding the pathophysiological processes underlying CF	C2	MK	Workshops	MCQ, Assignments	SAQ	Pathology, ObG, PSM, Paediatrics



HomU G-PM I.20.5			Description of treatment modalities including airway clearance techniques, medications, and nutritional support	Discuss the medical management of CF	C2	DK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Paediatrics
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### 6.3.7. Huntington's disease-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.21.1	K&S	K	Explanation of HD, its causes, and characteristics	Understanding the definition and basic features of HD	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology
HomU G-PM I.21.2			Overview of the mutation in the HTT gene and its inheritance pattern	Describe the genetic basis of HD	C1	MK	Lecture, Discussion	MCQ, Assignments	SAQ, Viva voce	Pathology

HomU G-PM I.21.3		KH	Description of motor, cognitive, and psychiatric symptoms associated with HD	Identification of clinical features suggestive of HD	C2	MK	Lecture, Assignments	Assignments, MCQ	SAQ, MCQ	Pathology, Paediatrics
HomU G-PM I.21.4			Explanation of the mechanisms leading to neuronal dysfunction and degeneration in HD	Understanding the physiological processes underlying HD	C2	MK	Workshops	MCQ, Assignments	SAQ	Pathology, ObG, PSM, Paediatrics
HomU G-PM I.21.5			Explanation of genetic counseling services, predictive testing, and family planning options for HD	Explain the importance of genetic counseling and testing in HD	C2	DK	Workshop, Seminar	Tutorials, assignment		Psychology, PSM

### 6.3.8. Marfan's syndrome-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert 's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.22.1	K&S	K	Explanation of Marfan Syndrome, its causes, and characteristics	Understanding the definition and basic features of Marfan Syndrome	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology
HomU G-PM I.22.2			Overview of mutations in the FBN1 gene and their effects on connective tissue	Describe the genetic basis of Marfan Syndrome	C1	MK	Lecture, Discussion	MCQ, Assignments	SAQ, Viva voce	Pathology
HomU G-PM I.22.3		KH	Description of skeletal, cardiovascular, and ocular manifestations associated with Marfan Syndrome	Identification of clinical features suggestive of Marfan Syndrome	C2	MK	Lecture, Assignments	Assignments, MCQ	SAQ, MCQ	Pathology, Paediatrics
HomU G-PM I.22.4			Explanation of the mechanisms leading to connective tissue abnormalities and organ dysfunction in Marfan Syndrome	Understanding the pathophysiological processes underlying Marfan Syndrome	C2	MK	Workshops	MCQ, Assignments	SAQ	Pathology, ObG, PSM, Paediatrics

HomU G-PM I.22.5			Description of treatments including medications, surgery, and lifestyle modifications for managing Marfan Syndrome symptoms	Discuss the medical management of Marfan Syndrome	C2	DK	Interactive workshops , Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Paediatrics
HomU G-PM I.22.6			Explanation of genetic counseling services, family screening, and prenatal testing for Marfan Syndrome	Explain the importance of genetic counseling and screening in Marfan Syndrome	C2	DK	Workshop , Seminar	Tutorials, assignments		Psychology, PSM

### 6.3.9. Polycystic kidney disease-

Sl. No.	Competency	Millers Level:	Content	SLO	Blooms Domain / Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.23.1	K&S	K	Explanation of PKD, its causes, and characteristics	Understanding the definition and basic features of PKD	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology

HomU G-PM I.23.2			Overview of mutations in the PKD1 and PKD2 genes and their effects on kidney development	Describe the genetic basis of PKD	C1	MK	Lecture, Discussion	MCQ, Assignments	SAQ, Viva voce	Pathology
HomU G-PM I.23.3		KH	Description of renal and extrarenal manifestations associated with PKD	Identification of clinical features suggestive of PKD	C2	MK	Lecture, Assignments	Assignments, MCQ	SAQ, MCQ	Pathology, Paediatrics
HomU G-PM I.23.4			Explanation of the mechanisms leading to cyst formation, kidney enlargement, and renal dysfunction in PKD	Understanding the physiological processes underlying PKD	C2	MK	Workshops	MCQ, Assignments	SAQ	Pathology, ObG, PSM, Paediatrics
HomU G-PM I.23.5			Description of treatments including blood pressure control, pain management, and dialysis/transplantation for managing PKD complications	Discuss the medical management of PKD	C2	DK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Paediatrics

HomU G-PM I.23.6			Explanation of genetic counseling services, family screening, and prenatal testing for PKD	Explain the importance of genetic counseling and screening in PKD	C2	DK	Workshop , Seminar	Tutorials, assignments		Psychology, PSM
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### 6.3.10. Neoplasia-

Sl. No.	Domain of Competency	Millers Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomU G-PM I.24.1	K&S	K	Explanation of neoplasia, its definition, and characteristics	Understanding the definition and basic features of neoplasia	C1	MK	Lecture, Discussion	Quizzes, Class participation	SAQ	Pathology
HomU G-PM I.24.2			Overview of benign and malignant neoplasms, including carcinomas, sarcomas, and hematologic malignancies	Recognition of different types of neoplasms based on histological and molecular characteristics	C1	MK	Lecture, Discussion	MCQ, Assignments	SAQ, Viva voce	Pathology

HomU G-PM I.24.3		KH	Description of the multistep process of carcinogenesis, including initiation, promotion, and progression	Understanding the molecular and cellular events leading to the development of cancer	C2	MK	Lecture, Assignments	Assignments, MCQ	SAQ, MCQ	Pathology
HomU G-PM I.24.4			Identification of environmental, genetic, and lifestyle factors contributing to cancer risk	Recognition of modifiable and non-modifiable risk factors for cancer	C2	MK	Workshops	MCQ, Assignments	SAQ	PSM, Clinical medicine
HomU G-PM I.24.5			Description of screening tests and preventive measures for various types of cancer	Discuss the principles of cancer screening and prevention	C2	DK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	PSM, Clinical medicine
HomU G-PM I.24.6			Description of common signs and symptoms associated with cancer, including pain, weight loss, and fatigue	Identification of clinical features suggestive of cancer	C2	MK	Interactive workshops, Case-based learning	Tutorials, MCQ	SAQ, Viva voce	Clinical medicine

HomUG-PM I.24.7			Explanation of diagnostic tests such as imaging, biopsy, and tumor markers used in cancer diagnosis	Discuss the diagnostic workup for cancer	C2	DK	Assignments	Tutorials, MCQ	SAQ, Viva voce	Clinical Medicine, Radiology, Laboratory medicine, Pathology
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#### 6.4. Competency Tables for Infectious Diseases and Tropical Diseases

Sl. No.	Domain of Competency	Miller's Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomUG-PM I.25.1	K&S	K	<b>Herpes simplex viruses [HSV] infections</b>	Define Herpes simplex viruses [HSV] infections	C1	MK	Lecture, Multimedia presentation, Case Based	MCQ, Quiz, Case Based, Morphology Chart, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Community Medicine, Paediatrics, Dermatology
				Discuss etiopathogenesis for HSV Infections	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of HSV Infections	C2	MK	Lecture, field visit			Community Medicine
				Explain how HSV Infections	C2	MK	Lecture, field visit			Community Medicine



			spreads from person to person						
			Describe the different clinical spectrum of HSV Infections	C2	MK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from different clinical spectrum of HSV Infections	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for HSV Infections	C1	MK	Lecture, Case Based			
			Describe the differential diagnosis of HSV Infections	C2	MK	Lecture, Case Based			
		K	Describe the potential complications of HSV Infections	C2	MK	Lecture, Case Based			
		KH	Discuss the prognosis of HSV Infections	C2	MK	Lecture, Case Based			

				Summarize the treatment and management options for HSV Infections	C2	MK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for the HSV Infections	C1	MK	Lecture, Case Based			Materia Medica
		KH		Describe the strategies to prevent HSV Infections transmission	C2	MK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.2	K&S	K	<b>Varicella-zoster virus (VZV) infection</b>	Define Varicella-zoster virus infection (VZV)	C1	MK	Lecture, Multimedia presentation, Case Based	MCQ, Quiz, Case Based, Morphology Chart, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Community Medicine, Pediatrics, Dermatology
				Discuss etiopathogenesis for Varicella-zoster virus (VZV) infection	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of Varicella-zoster virus (VZV) infection	C2	MK	Lecture, field visit			Community Medicine

			Explain how Varicella-zoster virus (VZV) infection spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
			Describe the different clinical spectrum of Varicella-zoster virus (VZV) infection	C2	MK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from Varicella-zoster virus (VZV) infection	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for Varicella-zoster virus (VZV) infection	C1	MK	Lecture, Case Based			
			Describe the differential diagnosis of Varicella-zoster virus (VZV) infection	C2	MK	Lecture, Case Based			

			Describe the potential complications arising from Varicella-zoster virus (VZV) infection as per the different clinical spectrum	C2	MK	Lecture, Case Based			
			Discuss the prognosis of different clinical spectrum of Varicella-zoster virus (VZV) infection	C2	MK	Lecture, Case Based			
			Summarize the treatment and management options for different clinical spectrum of Varicella-zoster virus (VZV) infection	C2	MK	Lecture, Case Based			Organon
		K	Enumerate the indications of homoeopathic medicines for different clinical spectrum of Varicella-zoster	C1	MK	Lecture, Case Based			Materia Medica

				virus (VZV) infection						
		KH		Describe the strategies to prevent Varicella-zoster virus (VZV) infection	C2	MK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.3	K&S	K	<b>Epstein-Barr virus [EBV] Infections</b>	Define EBV Infections	C1	MK	Lecture, Multimedia presentation, Assignment - Literature Review	MCQ, Quiz, Viva	LQ, SQ, MCQ, Viva	Pathology, Community Medicine, Pediatrics, Dermatology
				Discuss etiopathogenesis for EBV Infections	C2	MK	Lecture			
				Identify the epidemiology dimension of EBV Infections	C2	MK	Lecture, field visit			Community Medicine
				Explain how EBV Infections spreads from person to person	C2	MK	Lecture, field visit			Community Medicine

				Describe the clinical presentations of EBV Infections - infectious mononucleosis	C2	MK	Lecture			
				State the investigations to be done for the patient suffering from EBV Infections	C1	MK	Lecture			Pathology
		KH		Enumerate the diagnostic features for EBV Infections	C1	MK	Lecture			
				Describe the differential diagnosis of EBV Infections	C2	MK	Lecture			
		K		Describe the potential complications of EBV Infections	C2	MK	Lecture			
		KH		Discuss the prognosis of EBV Infections	C2	MK	Lecture			
				Summarize the treatment and management options for EBV Infections	C2	MK	Lecture			Organon

		K		Enumerate the indications of homoeopathic medicines for the EBV Infections	C1	MK	Lecture			Materia Medica
		KH		Describe the strategies to prevent EBV Infections transmission	C2	MK	Lecture			Community Medicine
HomUG -PM I.25.4	K&S	K	<b>Poliovirus Infections</b>	Define Poliovirus Infections	C1	DK	Lecture, Multimedia presentation, Assignment - Literature Review	MCQ, Quiz, Viva	LQ, SQ, MCQ, Viva	Pathology, Community Medicine, Pediatrics, Dermatology
				Discuss etiopathogenesis for Poliovirus Infections	C2	DK	Lecture, Case Based			
				Identify the epidemiology dimension of Poliovirus Infections	C2	DK	Lecture, field visit			Community Medicine
				Describe the clinical presentations of Poliovirus Infections	C2	DK	Lecture, Case Based			

				State the investigations to be done for the patient suffering from Poliovirus Infections	C1	DK	Lecture, Case Based			Pathology
		KH		Enumerate the diagnostic features for Poliovirus Infections	C1	DK	Lecture, Case Based			
				Describe the differential diagnosis of Poliovirus Infections	C2	DK	Lecture, Case Based			
		K		Describe the potential complications of Poliovirus Infections	C2	DK	Lecture, Case Based			
		KH		Discuss the prognosis of Poliovirus Infections	C2	DK	Lecture, Case Based			
				Summarize the treatment and management options for Poliovirus Infections	C2	DK	Lecture, Case Based			Organon, Immunology



		K		Enumerate the indications of homoeopathic medicines for the Poliovirus Infections	C1	DK	Lecture, Case Based			Materia Medica
		KH		Describe the strategies to prevent Poliovirus Infections transmission	C2	MK	Lecture, Case Based			Community Medicine, Immunology
HomUG -PM I.25.5	K&S	K	Measles	Define Measles	C1	MK	Lecture, Multimedia presentation, Case Based	MCQ, Quiz, Case Based, Morphology Chart, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Virology Community Medicine
				Discuss etiopathogenesis for measles	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of measles	C2	MK	Lecture, field visit			Community Medicine
				Explain how measles Infections spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
				Describe the clinical features of measles	C2	MK	Lecture, Case Based			

			State the investigations to be done for the patient suffering from Measles	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for Measles	C1	MK	Lecture, Case Based			
		K	Describe the potential complications of measles	C2	MK	Lecture, Case Based			
		KH	Describe the differential diagnosis of measles	C2	MK	Lecture, Case Based			
			Discuss the prognosis of Measles	C2	MK	Lecture, Case Based			
			Summarize the treatment and management options for Measles	C2	MK	Lecture, Case Based			Organon, Immunology
		K	Enumerate the indications of homoeopathic medicines for the Measles	C1	MK	Lecture, Case Based			Materia Medica

		KH		Describe the strategies to prevent Measles	C1	MK	Lecture, Case Based			Community Medicine, Immunology
HomUG-PM I.25.6	K&S	K	<b>Mumps</b>	Define Mumps	C1	MK	Lecture, Multimedia presentation, Case Based	MCQ, Quiz, Case Based, Morphology Chart, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Virology Community Medicine
				Discuss etiopathogenesis for Mumps	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of mumps	C2	MK	Lecture, field visit			Community Medicine
				Explain how mumps infections spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
				Describe the clinical manifestations of Mumps	C2	MK	Lecture, Case Based			
				State the investigations to be done for the patient suffering from Mumps	C1	MK	Lecture, Case Based			Pathology

		KH		Enumerate the diagnostic features for Mumps	C1	MK	Lecture, Case Based			
		K		Describe the potential complications of Mumps	C2	MK	Lecture, Case Based			
		KH		Describe the differential diagnosis of Mumps	C2	MK	Lecture, Case Based			
				Discuss the prognosis of Mumps	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for Measles	C2	MK	Lecture, Case Based			Organon, Immunology
		K		Enumerate the indications of homoeopathic medicines for the Mumps	C1	MK	Lecture, Case Based			Materia Medica
		K		Describe the strategies to prevent Mumps	C1	MK	Lecture, Case Based			Community Medicine, Immunology

HomUG -PM I.25.7	K&S	K	Rabies	Define Rabies	C1	DK	Lecture, Multimedia presentation, Assignment - Literature Review	MCQ, Quiz, Viva	SQ, MCQ, Viva	Pathology, Virology Community Medicine
		Discuss etiopathogeneis for Rabies		C2	DK	Lecture				
		Identify the epidemiology dimension of mumps		C2	DK	Lecture	Community Medicine			
		Explain how rabies infections spreads from person to person		C2	DK	Lecture	Community Medicine			
		Describe the different clinical sprectrum of Rabies		C2	DK	Lecture				
		State the investigations to be done for the patient suffering from Rabies		C1	DK	Lecture	Pathology			
		KH		Enumerate the diagnostic features for different	C1	DK	Lecture			

				spectrum of Rabies						
		K		Describe the potential complications of Rabies	C2	DK	Lecture			
		KH		Describe the differential diagnosis of Rabies	C2	DK	Lecture			
				Discuss the prognosis of Rabies	C2	DK	Lecture			
				Summarize the treatment and management options for Rabies	C2	DK	Lecture			Organon, Immunology
		K		Enumerate the indications of homoeopathic medicines for the Rabies	C1	DK	Lecture			Materia Medica
		K		Describe the strategies to prevent Rabies	C1	DK	Lecture			Community Medicine, Immunology
HomUG -PM I.25.8	K&S	K	<b>Dengue Virus Infection</b>	Define Dengue	C1	MK	Lecture, Multimedia presentatio	MCQ, Quiz, Case	LQ, SQ, MCQ	Pathology, Virology,

							n, Case Based	based, Viva	Case Based Viva	Community Medicine
				Discuss etiopathogenesis for dengue infection	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of dengue infection	C2	MK	Lecture, field visit			Community Medicine
				State the risk factors and high risk patients for dengue infection	C1	MK	Lecture, Case Based			
				Describe the different clinical spectrum of dengue infection	C2	MK	Lecture, Case Based			
				State the investigations to be done for the patient suffering from Dengue infection	C1	MK	Lecture, Case Based			Pathology
		KH		Enumerate the diagnostic features for dengue infection	C1	MK	Lecture, Case Based			

		K		Describe the complications of dengue infections as per the different clinical spectrum	C2	MK	Lecture, Case Based			
		KH		Describe the differential diagnosis of dengue infection	C2	MK	Lecture, Case Based			
				Discuss the prognosis of dengue infection as per the different clinical spectrum	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for dengue infection	C2	MK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for the dengue infections as per the different clinical spectrum	C1	MK	Lecture, Case Based			Materia Medica
		K		Describe the preventive strategies for the dengue infection	C1	MK	Lecture, Case Based			Community Medicine



HomUG -PM I.25.9	K&S	K	<b>Japanese encephalitis virus [JEV] Infection</b>	Define JEV Infection	C1	NK	Lecture, Multimedia presentation, Assignment - Literature Review	MCQ, Quiz, Viva	SQ, MCQ , Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for JEV infection	C2	NK	Lecture			
				Identify the epidemiology dimension of JEV infection	C2	NK	Lecture			Community Medicine
				Explain how JEV infections spreads from person to person	C2	NK	Lecture			Community Medicine
				Describe the different clinical spectrum of JEV infection	C2	NK	Lecture			
				State the investigations to be done for the patient suffering from JEV infection	C1	NK	Lecture			Pathology

		KH		Enumerate the diagnostic features for different spectrum of JEV infection	C1	NK	Lecture			
		K		Describe the potential complications of JEV infection	C2	NK	Lecture			
		KH		Describe the differential diagnosis of JEV infection	C2	NK	Lecture			
				Discuss the prognosis of JEV infection	C2	NK	Lecture			
				Summarize the treatment and management options for JEV infection	C2	NK	Lecture			Organon
		K		Enumerate the indications of homoeopathic medicines for the JEV infection	C1	NK	Lecture			Materia Medica
				Describe the strategies to prevent JEV infection	C1	NK	Lecture			Community Medicine

HomUG -PM I.25.10	K&S	K	<b>BIRD FLU</b>	Define BIRD FLU Infection	C1	NK	Lecture, Multimedia presentatio n, Assignmen t - Literature Review	MCQ, Quiz, Viva	SQ, MCQ , Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogeneis for BIRD FLU infection	C2	NK	Lecture			
				Identify the epidemiology dimension of BIRD FLU infection	C2	NK	Lecture, field visit			Community Medicine
				Explain how BIRD FLU Infections spreads from person to person	C2	NK	Lecture, field visit			Community Medicine
				Describe the clinical sprectrum of BIRD FLU infection	C2	NK	Lecture			
				State the investigations to be done for the patient suffering	C1	NK	Lecture			Pathology

				from BIRD FLU infection						
		KH		Enumerate the diagnostic features for different spectrum of BIRD FLU infection	C1	NK	Lecture			
		K		Describe the potential complications of BIRD FLU infection	C2	NK	Lecture			
		KH		Describe the differential diagnosis of BIRD FLU infection	C2	NK	Lecture			
				Discuss the prognosis of BIRD FLU infection	C2	NK	Lecture			
				Summarize the treatment and management options for BIRD FLU infection	C2	NK	Lecture			Organon

		K		Enumerate the indications of homoeopathic medicines for the BIRD FLU infection	C1	NK	Lecture			Materia Medica
				Describe the strategies to prevent JEV infection	C1	NK	Lecture			Community Medicine
HomUG -PM I.25.11	K&S	K	<b>Influenza A H1N1 virus</b>	Define Influenza A H1N1 virus Infection - Swine Flu	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case based, Viva	SQ, MCQ, Case Based, Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for Influenza A H1N1 virus Infection	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of Influenza A H1N1 virus Infection	C2	MK	Lecture, field visit			Community Medicine

			Explain how iH1N1 Infections spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
			Describe the clinical spectrum of Influenza A H1N1 virus Infection	C2	MK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from Influenza A H1N1 virus Infection	C1	MK	Lecture, Case Based			Pathology
		K	Enumerate the diagnostic features for different spectrum of Influenza A H1N1 virus Infection	C1	MK	Lecture, Case Based			
		K	Describe the potential complications of Influenza A H1N1 virus Infection	C2	MK	Lecture, Case Based			

		KH		Describe the differential diagnosis of Influenza A H1N1 virus Infection	C2	MK	Lecture, Case Based			
				Discuss the prognosis of Influenza A H1N1 virus Infection	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for Influenza A H1N1 virus Infection	C2	MK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for the Influenza A H1N1 virus Infection	C1	MK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent Influenza A H1N1 virus Infection	C1	MK	Lecture, Case Based			Community Medicine

HomUG -PM I.25.12	K&S	K	<b>Chikungunya virus Infection</b>	Define Chikungunya virus Infection - Chikungunya virus Disease	C1	MK	Lecture, Multimedia presentatio n, Case based, Assignmen t - Literature Review	MCQ, Quiz, Case based, Viva	SQ, MCQ , Case Based , Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogeneis for Chikungunya virus Infection	C2	MK	Lecture, Case Based			
				Identify the epidemiological dimensions of Chikungunya virus Infection, and Explain how it spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
				Describe the clinical features of Chikungunya virus Infection	C2	MK	Lecture, Case Based			
				State the investigations to be done for the patient suffering from Chikungunya virus Infection	C1	MK	Lecture, Case Based			Pathology



		KH		Enumerate the diagnostic features for Chikungunya virus Infection	C1	MK	Lecture, Case Based			
		K		Describe the potential complications of Influenza A H1N1 virus Infection	C2	MK	Lecture, Case Based			
		KH		Describe the differential diagnosis of Chikungunya virus Infection	C2	MK	Lecture, Case Based			
				Discuss the prognosis of Chikungunya virus Infection	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for Chikungunya virus Infection	C2	MK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for the Chikungunya virus Infection	C1	MK	Lecture, Case Based			Materia Medica

				Describe the strategies to prevent Chikungunya virus Infection	C1	MK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.13	K&S	K	<b>COVID 19 Virus Infection</b>	Define COVID 19 Virus Infection	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case based, Viva	SQ, MCQ, Case Based, Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for COVID 19 Virus Infection	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of COVID 19 Virus Infection	C2	MK	Lecture, field visit			Community Medicine
				Explain how COVID 19 Virus Infections spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
				Describe the different clinical spectrum of	C2	MK	Lecture, Case Based			

				COVID 19 Virus Infection						
				State the investigations to be done for the patient suffering from different clinical spectrum of COVID 19 Virus Infection	C1	MK	Lecture, Case Based			Pathology
		KH		Enumerate the diagnostic features for different spectrum of COVID 19 Virus Infection	C1	MK	Lecture, Case Based			
		K		Describe the potential complications of COVID 19 Virus Infection	C2	MK	Lecture, Case Based			
		KH		Describe the differential diagnosis of COVID 19 Virus Infection	C2	MK	Lecture, Case Based			
				Discuss the prognosis of	C2	MK	Lecture, Case Based			

				COVID 19 Virus Infection						
				Summarize the treatment and management options for COVID 19 Virus Infection	C2	MK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for the COVID 19 Virus Infection	C1	MK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent COVID 19 Virus Infection	C1	MK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.14	K&S	K	<b>Yellow Fever virus [YFV] Infection</b>	Define Yellow Fever virus [YFV] Infection	C1	NK	Lecture, Multimedia presentation	MCQ, Quiz, Viva	SQ, MCQ, Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for Yellow Fever virus [YFV] Infection	C2	NK	Lecture, Case Based			

			Identify the epidemiology dimension of Yellow Fever virus [YFV] Infection	C2	NK	Lecture, field visit			Community Medicine
			Explain how Yellow Fever virus [YFV] Infection spreads from person to person	C2	NK	Lecture, field visit			Community Medicine
			Describe the clinical spectrum of Yellow Fever virus [YFV] Infection	C2	NK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from Yellow Fever virus [YFV] Infection	C1	NK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for Yellow Fever virus [YFV] Infection	C1	NK	Lecture, Case Based			

		K		Describe the potential complications of Yellow Fever virus [YFV] Infection	C2	NK	Lecture, Case Based			
		K		Describe the differential diagnosis of Yellow Fever virus [YFV] Infection	C2	NK	Lecture, Case Based			
				Discuss the prognosis of Yellow Fever virus [YFV] Infection	C2	NK	Lecture, Case Based			
				Summarize the treatment and management options for Yellow Fever virus [YFV] Infection	C2	NK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for the Yellow Fever virus [YFV] Infection	C1	NK	Lecture, Case Based			Materia Medica

				Describe the strategies to prevent Yellow Fever virus [YFV] Infection	C1	NK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.15	K&S	K	<b>Smallpox (variola) - poxvirus infection</b>	Define Smallpox (variola) - poxvirus infection	C1	NK	Lecture, Multimedia presentation, Assignment - Literature Review	MCQ, Quiz, Viva	SQ, MCQ, Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for Smallpox (variola) - poxvirus infection	C2	NK	Lecture			
				Identify the epidemiology dimension of Smallpox (variola) - poxvirus infection	C2	NK	Lecture			Community Medicine
				Explain how Smallpox (variola) - poxvirus infection spreads	C2	NK	Lecture			Community Medicine

				from person to person						
				Describe the clinical spectrum of Smallpox (variola) - poxvirus infection	C2	NK	Lecture			
				State the investigations to be done for the patient suffering from clinical spectrum of Smallpox (variola) - poxvirus infection	C1	NK	Lecture			Pathology
		KH		Enumerate the diagnostic features of Smallpox (variola) - poxvirus infection	C1	NK	Lecture			
		K		Describe the potential complications of Smallpox (variola) - poxvirus infection	C2	NK	Lecture			



		KH		Describe the differential diagnosis of Smallpox (variola) - poxvirus infection	C2	NK	Lecture			
				Discuss the prognosis of Smallpox (variola) - poxvirus infection	C2	NK	Lecture			
				Summarize the treatment and management options for Smallpox (variola) - poxvirus infection	C2	NK	Lecture			Organon
		K		Enumerate the indications of homoeopathic medicines for the different stages related to Smallpox (variola) - poxvirus infection	C1	NK	Lecture			Materia Medica

				Describe the strategies to prevent Smallpox (variola) - poxvirus infection	C1	NK	Lecture			Community Medicine
HomUG -PM I.25.16	K&S	K	<b>HIV Infection</b>	Define the terms "HIV Infection" and "AIDS Syndrome"	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case based, Chart, Model, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for HIV Infection	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of HIV Infection	C2	MK	Lecture, field visit			Community Medicine
				Explain how HIV Infections spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
				Describe the different clinical spectrum of HIV Infection	C2	MK	Lecture, Case Based			

			State the investigations to be done for the patient suffering from different clinical spectrum of HIV Infection	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for different spectrum of HIV Infection	C1	MK	Lecture, Case Based			
		K	Describe the potential complications of HIV Infection	C2	MK	Lecture, Case Based			
		KH	Describe the differential diagnosis of HIV Infection	C2	MK	Lecture, Case Based			
			Discuss the prognosis of HIV Infection	C2	MK	Lecture, Case Based			
			Summarize the treatment and management options for HIV Infection	C2	MK	Lecture, Case Based			Organon, Immunology

		K		Enumerate the indications of homoeopathic medicines for the HIV Infection	C1	MK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent HIV Infection	C1	MK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.17	K&S	K	<b>Zika virus infection</b>	Define Zika virus infection	C1	NK	Lecture, Multimedia presentation	MCQ, Quiz, Viva	SQ, MCQ, Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for Zika virus infection	C2	NK	Lecture			
				Identify the epidemiology dimension of Zika virus infection	C2	NK	Lecture			Community Medicine
				Explain how Zika virus infection spreads from person to person	C2	NK	Lecture			Community Medicine
				Describe the different clinical spectrum of Zika virus infection	C2	NK	Lecture			

				State the investigations to be done for the patient suffering from clinical spectrum of Zika virus infection	C1	NK	Lecture			Pathology
		KH		Enumerate the diagnostic features for Zika virus infection	C1	NK	Lecture			
		K		Describe the potential complications of Zika virus infection	C2	NK	Lecture			
		KH		Describe the differential diagnosis of Zika virus infection	C2	NK	Lecture			
				Discuss the prognosis of Zika virus infection	C2	NK	Lecture			
				Summarize the treatment and management options for Zika virus infection	C2	NK	Lecture			Organon

		K		Enumerate the indications of homoeopathic medicines for the Zika virus infection	C1	NK	Lecture			Materia Medica
				Describe the strategies to prevent HIV Infection	C1	NK	Lecture			Community Medicine
HomUG -PM I.25.18	K&S	K	<b>Rickettsial infection</b>	Define Rickettsial infection	C1	NK	Lecture, Multimedia presentation	MCQ, Quiz, Viva	SQ, MCQ, Viva	Pathology, Virology, Community Medicine
				Discuss etiopathogenesis for Rickettsial infection	C2	NK	Lecture			
				Identify the epidemiology dimension of Rickettsial infection	C2	NK	Lecture			Community Medicine
				Explain how Rickettsial infection spreads from person to person	C2	NK	Lecture			Community Medicine
				Describe the common clinical spectrum of Rickettsial infection	C2	NK	Lecture			

				State the investigations to be done for the patient suffering from different clinical spectrum of Rickettsial infection	C1	NK	Lecture			Pathology
		KH		Enumerate the diagnostic features for different spectrum of Rickettsial infection	C1	NK	Lecture			
		K		Describe the potential complications of Rickettsial infection	C2	NK	Lecture			
		KH		Describe the differential diagnosis of Rickettsial infection	C2	NK	Lecture			
				Discuss the prognosis of Rickettsial infection	C2	NK	Lecture			

				Summarize the treatment and management options for Rickettsial infection	C2	NK	Lecture			Organon
		K		Enumerate the indications of homoeopathic medicines for the Rickettsial infection	C1	NK	Lecture			Materia Medica
				Describe the strategies to prevent Rickettsial infection	C1	NK	Lecture			Community Medicine
HomUG -PM I.25.19	K&S	K	<b>Staphylococcus aureus infection</b>	Define Staphylococcus aureus infection	C1	DK	Lecture, Multimedia presentation, Case Based	MCQ, Quiz, Case Based, Morphology Chart, Viva	SQ, MCQ, Case Based, Viva	Pathology, Bacteriology, Community Medicine
				State the factors predisposing to S. aureus colonisation and its infections / disease	C1	DK	Lecture, Case Based			
				Discuss etiopathogenesis for S. aureus infection	C2	DK	Lecture, Case Based			



				Identify the epidemiology dimension of S. aureus infection	C2	DK	Lecture, field visit			Community Medicine
				Explain how S. aureus infection spreads from person to person	C2	DK	Lecture, field visit			Community Medicine
				Enumerate the common clinical illness caused by S. aureus infection	C1	DK	Lecture, Case Based			
				Describe the clinical manifestation of common clinical illness which are caused by S. aureus infection	C2	DK	Lecture, Case Based			
				State the investigations to be done for the patient suffering from common clinical illness caused by S. aureus infection	C1	DK	Lecture, Case Based			Pathology

		KH		Enumerate the diagnostic features for common clinical illness caused by S. aureus infection	C1	DK	Lecture, Case Based				
		K		Describe the potential complications of common clinical illness caused by S. aureus infection	C2	DK	Lecture, Case Based				
		KH		Describe the differential diagnosis of common clinical illness caused by S. aureus infection	C2	DK	Lecture, Case Based				
				Discuss the prognosis of common clinical illness caused by S. aureus infection	C2	DK	Lecture, Case Based				
				Summarize the treatment and management options for common clinical	C2	DK	Lecture, Case Based			Organon	

				illness caused by S. aureus infection						
		K		Enumerate the indications of homoeopathic medicines for the common clinical illness caused by S. aureus infection	C1	DK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent common clinical illness caused by S. aureus infection	C1	DK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.20	K&S	K	<b>Streptococcal infections</b>	Define Streptococcal infections	C1	DK	Lecture, Multimedia presentation, Case Based	MCQ, Quiz, Case Based, Morphology Chart, Viva	SQ, MCQ, Case Based, Viva	Pathology, Bacteriology, Community Medicine
				Discuss etiopathogenesis for Streptococcal infections	C2	DK	Lecture, Case Based			
				Identify the epidemiology dimension of Streptococcal infections	C2	DK	Lecture, field visit			Community Medicine

			Explain how Streptococcal infections spreads from person to person	C2	DK	Lecture, field visit			Community Medicine
			Enumerate the common clinical illness caused by Streptococcal infections	C1	DK	Lecture, Case Based			
			Describe the clinical manifestation of comon clinical illness which are caused by Streptococcal infections	C2	DK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from common clinical illness caused by Streptococcal infections	C1	DK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for common clinical illness caused by S. aureus infection	C1	DK	Lecture, Case Based			

		K		Describe the potential complications of common clinical illness caused by S. aureus infection	C2	DK	Lecture, Case Based			
		KH		Describe the differential diagnosis of common clinical illness caused by Streptococcal infections	C2	DK	Lecture, Case Based			
				Discuss the prognosis of common clinical illness caused by S. aureus infection	C2	DK	Lecture, Case Based			
				Summarize the treatment and management options for common clinical illness caused by Streptococcal infection	C2	DK	Lecture, Case Based			Organon

		K		Enumerate the indications of homoeopathic medicines for the common clinical illness caused by Streptococcal infection	C1	DK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent common clinical illness caused by Streptococcal infection	C1	DK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.21	K&S	K	<b>Typhoid Fever</b>	Define Typhoid Fever	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case based, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Bacteriology, Community Medicine
				Discuss etiopathogenesis for Typhoid Fever	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of Typhoid Fever	C2	MK	Lecture, field visit			Community Medicine

			Explain how Typhoid Fever spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
			Describe the clinical course of clinical manifestation of Typhoid Fever	C2	MK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from Typhoid Fever	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for Typhoid Fever	C1	MK	Lecture, Case Based			
		K	Describe the potential complications of Typhoid Fever	C2	MK	Lecture, Case Based			
		KH	Describe the differential diagnosis of Typhoid Fever	C2	MK	Lecture, Case Based			
			Discuss the prognosis of Typhoid Fever	C2	MK	Lecture, Case Based			

		K		Summarize the treatment and management options for Typhoid Fever	C2	MK	Lecture, Case Based			Organon
				Enumerate the indications of homoeopathic medicines for Typhoid Fever	C1	MK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent Typhoid Fever	C1	MK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.22	K&S	K	<b>Acute Viral Gastroenteritis</b>	Define Acute Viral Gastroenteritis	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case based, Viva	SQ, MCQ, Case Based, Viva	Pathology, Bacteriology, Community Medicine
				Discuss etiopathogenesis for Acute Viral Gastroenteritis	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of Acute Viral Gastroenteritis	C2	MK	Lecture, field visit			Community Medicine



				Explain how infection of Acute Viral Gastroenteritis spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
				Describe the clinical manifestation of Acute Viral Gastroenteritis	C2	MK	Lecture, Case Based			
				State the investigations to be done for the patient suffering from Acute Viral Gastroenteritis	C1	MK	Lecture, Case Based			Pathology
		KH		Enumerate the diagnostic features for Acute Viral Gastroenteritis	C1	MK	Lecture, Case Based			
		K		Describe the potential complications of Acute Viral Gastroenteritis	C2	MK	Lecture, Case Based			
		KH		Describe the differential diagnosis of Acute Viral Gastroenteritis	C2	MK	Lecture, Case Based			

		K		Discuss the prognosis of Acute Viral Gastroenteritis	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for Acute Viral Gastroenteritis	C2	MK	Lecture, Case Based			
				Enumerate the indications of homoeopathic medicines for Acute Viral Gastroenteritis	C1	MK	Lecture, Case Based			
				Describe the strategies to prevent Acute Viral Gastroenteritis	C1	MK	Lecture, Case Based			
HomUG -PM I.25.23	K&S	K	<b>Cholera</b>	Define Cholera	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case based, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Bacteriology, Community Medicine

			Discuss etiopathogenesis for Cholera	C2	MK	Lecture, Case Based			
			Identify the epidemiology dimension of Cholera	C2	MK	Lecture, field visit			Community Medicine
			Explain how infection of Cholera spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
			Describe the clinical manifestation of Cholera	C2	MK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from Cholera	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features for Cholera	C1	MK	Lecture, Case Based			
		K	Describe the potential complications of Cholera	C2	MK	Lecture, Case Based			
		KH	Describe the differential	C2	MK	Lecture, Case Based			

				diagnosis of Cholera						
				Discuss the prognosis of Cholera	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for Cholera	C2	MK	Lecture, Case Based			
				Enumerate the indications of homoeopathic medicines for Cholera	C1	MK	Lecture, Case Based			Organon
				Describe the strategies to prevent Cholera	C1	MK	Lecture, Case Based			Materia Medica
HomUG -PM I.25.24	K&S	K	<b>Tetanus</b>	Define Tetanus	C1	NK	Lecture, Multimedia presentation	MCQ, Quiz, Viva	SQ, MCQ, Viva	Pathology, Bacteriology, Community Medicine
				Discuss etiopathogenesis for Tetanus	C2	NK	Lecture			
				Describe the clinical manifestation of Tetanus	C2	NK	Lecture			

		KH		Enumerate the diagnostic features for Tetanus	C1	NK	Lecture			
		K		Describe the potential complications of Tetanus	C2	NK	Lecture			
		KH		Describe the differential diagnosis of Tetanus	C2	NK	Lecture			
				Discuss the prognosis of Tetanus	C2	NK	Lecture			
				Summarize the treatment and management options for Tetanus	C2	NK	Lecture			Organon
		K		Enumerate the indications of homoeopathic medicines for Tetanus	C1	NK	Lecture			Materia Medica
				Describe the strategies to prevent and / or prophylaxis in the wound management of Tetanus	C1	NK	Lecture			Community Medicine

HomUG -PM I.25.25	K&S	K	<b>Anthrax</b>	Define Anthrax	C1	NK	Lecture, Multimedia presentation	MCQ, Quiz, Viva	SQ, MCQ , Viva	Pathology, Bacteriology Community Medicine
				Discuss etiopathogeneis for Anthrax	C2	NK	Lecture			
				Identify the epidemiology dimension of Anthrax	C2	NK	Lecture			Community Medicine
				Explain how infection of Anthrax spreads from person to person	C2	NK	Lecture			Community Medicine
				Describe the clinical manisfestation of Anthrax / brucellosis / plague	C2	NK	Lecture			
				State the investigations to be done for the patient suffering from Anthrax	C1	NK	Lecture			Pathology
		KH		Enumerate the diagnostic features for Anthrax	C1	NK	Lecture			

		K		Describe the potential complications of Anthrax	C2	NK	Lecture			
		KH		Describe the differential diagnosis of Anthrax	C2	NK	Lecture			
				Discuss the prognosis of Anthrax	C2	NK	Lecture			
				Summarize the treatment and management options for Anthrax	C2	NK	Lecture			Organon
		K		Enumerate the indications of homoeopathic medicines for Anthrax	C1	NK	Lecture			Materia Medica
				Describe the strategies to prevent Anthrax	C1	NK	Lecture			Community Medicine
HomUG -PM I.25.26	K&S	K	Brucellosis	Define Brucellosis	C1	NK	Lecture, Multimedia presentation	MCQ, Quiz, Viva	SQ, MCQ , Viva	Pathology, Bacteriology Community Medicine
				Discuss etiopathogeneis for Brucellosis	C2	NK	Lecture			

			Identify the epidemiology dimension of Brucellosis	C2	NK	Lecture			Community Medicine
			Explain how infection of Brucellosis spreads from person to person	C2	NK	Lecture			Community Medicine
			Describe the clinical manifestation of Brucellosis	C2	NK	Lecture			
			State the investigations to be done for the patient suffering from Brucellosis	C1	NK	Lecture			Pathology
		KH	Enumerate the diagnostic features for Brucellosis	C1	NK	Lecture			
		K	Describe the potential complications of Brucellosis	C2	NK	Lecture			
		KH	Describe the differential diagnosis of Brucellosis	C2	NK	Lecture			



		K		Discuss the prognosis of Brucellosis	C2	NK	Lecture			
				Summarize the treatment and management options for Brucellosis	C2	NK	Lecture			
				Enumerate the indications of homoeopathic medicines for Brucellosis	C1	NK	Lecture			
				Describe the strategies to prevent Brucellosis	C1	NK	Lecture			
HomUG -PM I.25.27	K&S	K	Plague	Define Plague	C1	DK	Lecture, Multimedia presentation, Assignment - Literature Review	MCQ, Quiz, Viva	LQ, SQ, MCQ, Viva	Pathology, Bacteriology, Community Medicine
				Discuss etiopathogenesis for Plague	C2	DK	Lecture			
				Identify the epidemiology dimension of Plague	C2	DK	Lecture			Community Medicine

			Explain how infection of Plague spreads from person to person	C2	DK	Lecture			Community Medicine
			Describe the clinical manifestation of Plague	C2	DK	Lecture			
			State the investigations to be done for the patient suffering from Plague	C1	DK	Lecture			Pathology
		KH	Enumerate the diagnostic features for Plague	C1	DK	Lecture			
		K	Describe the potential complications of Plague	C2	DK	Lecture			
		KH	Describe the differential diagnosis of Plague	C2	DK	Lecture			
			Discuss the prognosis of Plague	C2	DK	Lecture			

		K		Summarize the treatment and management options for Plague	C2	DK	Lecture			Organon
				Enumerate the indications of homoeopathic medicines for Plague	C1	DK	Lecture			Materia Medica
				Describe the strategies to prevent Plague	C1	DK	Lecture			Community Medicine
HomUG -PM I.25.28	K&S	K	<b>Leprosy</b>	Define Leprosy	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case Based, Model, Chart, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Bacteriology, Community Medicine
				Discuss etiopathogenesis for Leprosy	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of Leprosy	C2	MK	Lecture, field visit			Community Medicine
				Explain how infection of Leprosy spreads from person to person	C2	MK	Lecture, field visit			Community Medicine

				Describe the different clinical manisfestation of different types of Leprosy	C2	MK	Lecture, Case Based				
				State the investigations to be done for the patient suffering from Leprosy	C1	MK	Lecture, Case Based			Pathology	
		KH		Enumerate the diagnostic features for different types of Leprosy	C1	MK	Lecture, Case Based				
		K		Describe the potential complications of different types of Leprosy	C2	MK	Lecture, Case Based				
		KH		Describe the differential diagnosis of different types of Leprosy	C2	MK	Lecture, Case Based				
				Discuss the prognosis of different types of Leprosy	C2	MK	Lecture, Case Based				

				Summarize the treatment and management options for different types of Leprosy	C2	MK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for different types of Leprosy	C1	MK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent different types of Leprosy	C1	MK	Lecture, Case Based			Community Medicine
HomUG -PM I.25.29	K&S	K	Tuberculosis	Define Tuberculosis	C1	MK	Lecture, Multimedia presentation, Case based, Assignment - Literature Review	MCQ, Quiz, Case Based, Model, Chart, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Bacteriology, Community Medicine
				Discuss etiopathogenesis for Tuberculosis	C2	MK	Lecture, Case Based			
				Identify the epidemiology dimension of Tuberculosis	C2	MK	Lecture, field visit			Community Medicine

			Explain how infection of Tuberculosis spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
			Describe the different clinical manifestation of different types of Tuberculosis	C2	MK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from different types of Tuberculosis	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features of different types of Tuberculosis	C1	MK	Lecture, Case Based			
		K	Describe the potential complications of of different types of Tuberculosis	C2	MK	Lecture, Case Based			
		KH	Describe the differential diagnosis of of different types of Tuberculosis	C2	MK	Lecture, Case Based			

		K		Discuss the prognosis of different types of Tuberculosis	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for different types of Tuberculosis	C2	MK	Lecture, Case Based			
				Enumerate the indications of homoeopathic medicines for different types of Tuberculosis	C1	MK	Lecture, Case Based			
				Describe the strategies to prevent different types of Tuberculosis	C1	MK	Lecture, Case Based			
HomUG -PM I.25.30	K&S	K	Malaria Fever	Define Malaria Fever	C1	MK	Lecture, Multimedia presentation, Case Based	MCQ, Quiz, Case Based, Model, Chart, Viva	LQ, SQ, MCQ, Case Based, Viva	Pathology, Parasitology, Community Medicine
				Discuss etiopathogenesis for different types of Malaria Fever	C2	MK	Lecture, Case Based			

			Identify the epidemiology dimension of Malaria Fever	C2	MK	Lecture, field visit			Community Medicine
			Explain how infection of Malaria spreads from person to person	C2	MK	Lecture, field visit			Community Medicine
			Describe the different clinical manifestation of different types of Malaria Fever	C2	MK	Lecture, Case Based			
			State the investigations to be done for the patient suffering from different types of Malaria Fever	C1	MK	Lecture, Case Based			Pathology
		KH	Enumerate the diagnostic features of different types of Malaria Fever	C1	MK	Lecture, Case Based			
		K	Describe the potential complications of different types of Malaria Fever	C2	MK	Lecture, Case Based			



		KH		Describe the differential diagnosis of different types of Malaria Fever	C2	MK	Lecture, Case Based			
				Discuss the prognosis of different types of Malaria Fever	C2	MK	Lecture, Case Based			
				Summarize the treatment and management options for different types of Malaria Fever	C2	MK	Lecture, Case Based			Organon
		K		Enumerate the indications of homoeopathic medicines for different types of Malaria Fever	C1	MK	Lecture, Case Based			Materia Medica
				Describe the strategies to prevent different types of Malaria Fever	C1	MK	Lecture, Case Based			Community Medicine

### 6.5. Competency Tables for Bedside Clinics

Sl. No.	Domain of Competency	Miller's Level	Content	SLO	Blooms Domain/ Guilbert's Level	Priority	T-L Methods	Assessment		Integration
								F	S	
HomUG-PM I.26.1	K&S	SH	Taking patient history including chief complaints, present illness, past medical history, family history, and personal history	Demonstration of effective communication and questioning skills	A1/2	MK	Simulated patient encounters	Observation of history-taking sessions, Peer feedback	OSCE	Case discussions with clinical preceptors
HomUG-PM I.26.2	PC		Conducting a systematic physical examination including general examination, systemic examination, and regional examination	Demonstration of proficiency in physical examination techniques	P2	MK	Simulation, Bedside demonstrations	Observation of physical examination sessions, Peer feedback	OSCE	Clinical rotations with supervision

HomU G-PM I.26.3			Analyzing patient history, physical examination findings, and relevant investigations to develop a list of possible diagnoses	Demonstration of critical thinking and clinical reasoning skills	P2/A2	MK	Case-based discussions, Problem-solving scenarios	Case analyses, Guided discussions	Viva voce, Bedside examination	Interactive case-based learning with faculty
HomU G-PM I.26.4			Developing appropriate management strategies including pharmacological, non-pharmacological, and lifestyle interventions	Demonstration of knowledge of evidence-based medicine and treatment guidelines	P2/A2	MK	Small group discussions, Clinical case presentations	Group Discussions	OSCE	Clinical rotations with treatment planning exercises
HomU G-PM I.26.5			Demonstrating empathetic communication, active listening, and professionalism in patient interactions and team communication	Demonstration of interpersonal and communication skills	A2	MK	Simulated patient encounters	Observation of communication skills, Peer feedback	OSCE	Communication exercises

HomU G-PM I.26.6			Recording patient history, examination findings, assessments, and management plans in a clear and organized manner	Demonstration of effective documentation skills	P3	MK	Charting exercises, Case note writing	Review of documentation, Peer feedback	OSCE	Clinical rotations with documentation review
HomU G-PM I.26.7			Adhering to professional standards, maintaining patient confidentiality, and respecting patient autonomy and diversity	Demonstration of ethical decision-making and professionalism	A3	MK	Group Discussions	Observations of professional conduct, Peer evaluations	OSCE	Reflection exercises and discussions

## 7. Teaching learning methods

<b>Lectures</b>	<b>Non-lectures (clinical / practical / demonstrative)</b>
Classroom lectures with oral presentation/ AV aid	Clinical Demonstration
Integrated teaching	Case Based Discussion
	PBL - Problem Based Learning
	Simulation – with mannequins
	OSCE – Objective Structure Clinical Examination
	Mini-CEX - mini clinical evaluation exercise
	Seminar: Integrated Medical Education Seminar
	Tutorials: Small Group Projects
	Chart and Model
	Assignment

### 8. Details of assessment

***Note-*** The assessment in II BHMS shall be done only as Internal Assessment (IA) in terms of Periodical Assessments ( PA) and Term Tests (TT) as detailed below. There shall not be any Final University Examination (FUE) at this level. The marks obtained in IA during II BHMS will be added to the marks of IA in the IV BHMS University Examination.

#### Overall Scheme of Internal Assessment (IA)\*\*

Professional Course/ Subject	Term I (1-6 Months)		Term II (7-12 Months)	
	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	TT II (end of 12 months)
II BHMS/ Practice of Medicine	20 Marks Viva- A	100 Marks Clinical/Practical and Viva - E  i) Viva voce -50 marks ii) Clinical/practical*- 50	20 Marks Viva- B	100 Marks Clinical/Practical and Viva - F  i) Viva voce -50 marks ii) Clinical/practical*- 50

***\*Practical Examinations:***

- i. Case taking: 20 Marks for case taking, including history, symptoms of patient in detail.
- ii. Examination skills: 10 marks for the proper demonstration of skills.
- iii. Bedside Q n A session: 15 marks for demonstrating understanding of concepts and for applying knowledge to identify the problem.
- iv. Spotters: 5 marks (Instruments: Identification and Indications; Reports: Observations, Causes, Diagnosis/Differential Diagnosis)

**\*\*Method of Calculation of Internal Assessment Marks in II BHMS for Final University Examination to be held in IV BHMS:**

Marks of PA I	Marks of PA II	Periodical Assessment Average PA I+ PA II /2	Marks of TT I	Marks of TT II	Terminal Test Average TT I + TT II / 200 x 20	Final Internal Assessment Marks
A	B	D	E	F	G	D+G/2

**9. List of recommended text/reference books**

- Alagappan, R. (2017). *Manual of Practical Medicine* (6th ed.). Jaypee Brothers Medical Publishers (P) Ltd.
- Penman I.D., Ralston S.H., Strachan M.W.J., & Hobson R. (2022). *Davidson's Principles and Practice of Medicine* (24th ed.) Elsevier Health Sciences.
- Anudeep, B. A. P. (2022). *Insider's guide to clinical medicine* (2nd ed.) Jaypee Brothers Medical (P) Ltd.
- Golwala, A. F., & Vakil, R. J. (2008). *Physical diagnosis A textbook of symptoms and signs* (16th ed.). Media Promoters & Publishers.
- Glynn, M., & Drake, W. M. (2017). *Hutchison's clinical methods: An Integrated Approach to Clinical Practice*. Saunders.
- *Harrison's principles of internal medicine (2vols)* (21st ed.). (2022). McGraw-Hill.
- Bickley. (2016). *Bates' pocket guide to physical exam & history taking* (8th ed.). Wolters Kluwer India Pvt. Ltd.
- Dover, A. R., Innes, J. A., & Fairhurst, K. (2023). *Macleod's clinical examination international edition*. (15th ed.). Elsevier.
- Allen, H. C. (1998). *Therapeutics of intermittent fever*. B. Jain Publishers
- Bell, J. B. (2016). *The homeopathic therapeutics of diarrhea, dysentery, cholera, cholera morbus, cholera infantum, and all other loose evacuations of the bowels (Classic reprint)*. Forgotten Books.

- Boericke, W. (2022). *New Manual of Homoeopathic Materia Medica and Repertory with Relationship of Remedies: Including Indian Drugs, Nosodes Uncommon, Rare Remedies, Mother Tinctures, Relationship, Sides of the Body, Drug Affinities and List of Abbreviation* (3rd ed.). B Jain Publishers Pvt Limited.
- Hahnemann, S. (2004). *Organon of Medicine*. B Jain Publishers Pvt Limited.
- Lilienthal, S. (2005). *Homoeopathic therapeutics*. B Jain Pub Pvt Limited.
- Nash, E. B. (2002). *Leaders in homoeopathic therapeutics*. B Jain Pub Pvt Limited.
- Tyler, M. L. (1993). *Pointers to the common remedies*. B. Jain Publishers

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**Subject name – Surgery**

**Subject code- HomUG -Sur -I**

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## **1. Preamble**

Surgery involves addressing acute or chronic injuries, deformities, or diseases through physical intervention such as removal, repair, or reconstruction of a specific part or organ. Specialized fields like ENT, Ophthalmology, Dentistry, and Orthopedics, as well as super specialties like cardiac, neuro, and oncosurgery, have gained prominence.

Homoeopathy has proven to play a significant role in preventing several surgical interventions, provided that the physician can diagnose the condition early and administer the appropriate treatment while also considering supplementary measures. Therefore, a homoeopathic physician should possess a solid understanding of surgery. A student of homoeopathy should be able to diagnose clinical conditions to effectively address the scope and limitations of homoeopathy in surgical cases. It is essential for students to learn the Hahnemannian concept of surgical diseases, chronic diseases, and susceptibility for the effective management of surgical conditions.

The management of surgical cases according to both modern medicine and Organon is a crucial part of the education and training of homoeopathic students. A comprehensive understanding and application of Homoeopathic principles, along with the correct knowledge of Homoeopathic medicines, can extend the use of Homoeopathy to a range of acute and chronic surgical conditions that were previously considered beyond its scope. Understanding surgical conditions enables students to provide continuity of care, particularly when patients transition between surgical interventions and homeopathic management. Equipping homeopathic students with knowledge of surgical conditions allows them to make informed decisions and recommend suitable treatment options, whether surgical or non-surgical. By studying surgical conditions, homeopathic students can offer comprehensive and integrated healthcare to their patients, leading to improved health outcomes and patient satisfaction.

## **2. Course outcomes**

At the end of BHMS course, the student shall be able to-

- i) Diagnose common surgical conditions.
- ii) Understand the role of Homoeopathic treatment in pseudo-surgical and true surgical diseases.
- iii) Record the surgical case history that is complete and relevant to disease identification, help to find the correct Homoeopathic medicine that can be used for treating the condition.

- iv) Understand the fundamentals of examination of a patient with surgical problems.
- v) Demonstrate the ability to perform the bedside clinical procedures and the physical examination that is relevant for diagnosis and management of the disease.
- vi) Demonstrate ability to advise appropriate diagnostic tests (including radio-diagnosis) and interpretation of the test in the individual surgical case.
- vii) Perform basic management procedures of general surgery like wound dressing, ABC management, suturing, transport of the injured and fluid therapy etc.
- viii) Discuss causation, manifestations, management and prognosis of surgical conditions.
- ix) Understand the miasmatic background of surgical disorders, wherever applicable.
- x) Apply Materia medica (therapeutics) and posology in common surgical conditions.
- xi) Understand the use of repertory in Homoeopathic prescriptions for surgical conditions.

### **3. Learning objectives (to be edited according to the II BHMS content)**

At the end of II BHMS course, the learner shall be able to-

- i. Understand surgical case taking.
- ii. Understand common surgical symptomatology and its differential approach.
- iii. Demonstrate the basic management procedures of general surgery. Eg. dressing, ABC management and fluid therapy
- iv. Describe the concepts required to diagnose surgical clinical conditions taught in II BHMS.
- v. Understand the role of examination and investigation in diagnosing surgical disorders.
- vi. Identify referral criteria for medical emergencies and surgical conditions.
- vii. Classify symptoms and integration with repertory.
- viii. Understand applied Materia Medica and posology in common surgical conditions ( taught in II BHMS) which can be managed with Homoeopathy.

#### 4. Course content and its term-wise distribution

Sl. No.	Topic
<b>Term I</b>	
1.	Introduction to surgery, Scope and limitations of Homoeopathy in surgical conditions, Surgical diseases explained in relation to organon of medicine
2.	Trauma/Injury; different types of injuries- head injury; road traffic accident; injury to chest and abdomen
3.	Wound and wound healing; scars and keloids
4.	Haemorrhage and blood transfusion
5.	Shock; various types of shock
6.	Fluid, electrolyte and acid- base balance
7.	Burns and Skin grafting
8.	Nutrition
9.	Common surgical infections
<b>Term II</b>	
10.	Special infections
11.	Tumours and Cysts (Swellings)
12.	Hernia
13.	Ulcers
14.	Sinus and fistula

## 5. Teaching hours

### 5.1. Gross division of teaching hours

Surgery		
Year	Teaching hours- Lectures	Teaching hours- Non-lectures
II BHMS	92	24

### 5.2. Teaching hours theory

Sl. No.	Topic	Teaching hours
1.	Introduction to surgery, Scope and limitations of Homoeopathy in surgical conditions	3
2.	Injury – types Head injury; Road traffic accident; injury to chest, abdomen	10
3.	Wound & wound healing; Scar, keloid	5
4.	Haemorrhage Blood transfusion	4
5.	Shock	6
6.	Fluid, electrolytes and acid-base balance	6
7.	Burn, skin grafting	7
8.	Nutrition – consequents of malnutrition in surgical patients, nutritional requirement in surgical patients and methods of providing nutritional support	3
9.	Common surgical infections- Boil, Carbuncle, Abscess, Cellulitis, and erysipelas, Hidradenitis suppurativa, septicaemia, pyaemia	8
10.	Special infections-	8

	Tuberculosis, syphilis, acquired immunodeficiency syndrome, actinomycosis, leprosy, tetanus, infective gangrene	
11.	Concept of swellings- Tumours: Benign-Lipoma, fibroma, adenoma, neuroma, Neurilemmoma, Neurofibroma, Haemangioma Malignant-Carcinoma, sarcoma, fibrosarcoma; naevus, melanoma Cysts – Classification	12
12.	Hernia - Aetiology, General Classification, Abdominal hernias- Basic anatomy, Types, clinical features, management	10
13.	Ulcers	8
14.	Sinus and fistula	2
<b>Total</b>		<b>92</b>

### 5.3. Teaching hours Non-lecture

Sl No	Clinical	Hours
1	Case taking of surgical case	2
2	Examination of Trauma case, Transport of the injured	2
3	Examination of head injury case	2
4	Examination of wound, suture technique	1
5	Examination of haemorrhagic case	1
6	Examination of shock	1
7	Fluid, electrolytes and acid base balance - Clinical Examination and evaluation	1
8	Burns - Clinical Examination	1
9	Common surgical infections - Clinical Examination	2
10	Special infections - Clinical examination	2
11	Examination of swelling- cysts and tumours	2
12	Examination of hernia	2

13	Examination of ulcer	2
14	Examination of sinus, fistula	1
15	ABC management, wound dressing, fluid therapy	2
	<b>Total</b>	<b>24</b>

## 6. Content mapping (competencies tables)

### 6.1. Introduction to Surgery, scope and limitations of Homoeopathy in surgical conditions and surgical case taking -

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 1.1	HO	KH	Introduction to surgery	Describe surgical disease according to Hahnemann.  Explain the importance of knowledge of surgical diseases for Homoeopathic practice	C/2	Must know	Lecture Small group discussion	Viva	MCQ SAQ	Organon
Hom UG-Sur-I 1.2	HO	KH	Scope and limitations of Homoeopathy in surgical conditions	Explain scope and limitations of Homoeopathy in surgical conditions	C/2	Must know	Lecture Small group discussion	Viva	SAQ	Organon

Hom UG- Sur-I 1.3	HO	KH	Homoeopathic perspective of surgical diseases	Classification of Disease Hahnemannian: Surgical disease	C/2	Must know	Lecture	Viva	LAQ	Organon
Hom UG- Sur-I 1.4	HO	KH	Homoeopathic perspective of surgical diseases	Explain the nature and significance of surgical disease on the basis of organon of medicine	C/2	Must know	Lecture	Viva	LAQ	Organon
Hom UG- Sur-I 1.5	KS	KH	Case taking of surgical cases	Discuss the steps of case taking in surgical conditions	C/2	Must know	Lecture, small group discussion	Viva	--	Organon Repertory and case taking
Hom UG- Sur-I 1.6	PC	SH	Case taking of surgical case	Observe surgical case taking in clinical set up	P/1	Must know	Observation Small group discussion	DOPS		--



### 6.2. Trauma/ Injury and examination of trauma case-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 2.1	KS	KH	Types of injury	Classify different types of injury/trauma according to causation and be effects	C/2	Must know	Lecture Audiovisual mode	Viva	MCQ SAQ	FMT
Hom UG-Sur-I 2.2	HO	KH	Homoeopathic therapeutics of injury	List homeopathic remedies that are commonly used for specific types of injuries	C/1	Must know	Lecture Small group discussion	Viva	SAQ	Materia Medica
Hom UG-Sur-I 2.3	KS	KH	Principles in the management of road traffic accident	Describe the components of primary survey in victims of road traffic accidents	C/2	Must know	Lecture/ small group discussion	Viva OSCE	SAQ LAQ	--

				Describe the components of Secondary survey in victims of road traffic accidents	C/2	Must know	Lecture/ small group discussion			
Hom UG-Sur-I 2.4	PBL	SH	Resuscitation in trauma cases	Demonstrate the steps of Basic life support - Initiation of resuscitation Opening of airway Defibrillation High quality CPR Ventilation-compression ratio Vascular access Termination of CPR	P/2	Must know	Skill lab training Audio visual aids DOPS	DOPS Viva	DOPS	---
Hom UG-Sur-I 2.5	KS	KH	Resuscitation of trauma case	Discuss the principles of ATLS – advance trauma care management	C/2	Must know	Skill lab training Audio visual aids Small group discussion DOPS	Viva DOPS	MCQ SAQ LAQ DOPS	--

Hom UG- Sur-I 2.6	KS	KH	Management of trauma case	Discuss the principles of pre-hospital care and causality management of a trauma victim including principles of triage	C/2	Must know	Skill lab training Audio visual aids Small group discussion Small project	Viva OSCE	MCQ SAQ LAQ	--
Hom UG- Sur-I 2.7	PBL	SH	Resuscitation in trauma cases	Demonstrate the steps of Basic life support	P/2	Must know	Skill lab training Audiovisual aid DOPS	Viva OSCE Small project	OSC E	---
Hom UG- Sur-I 2.8	PBL	SH	Management of trauma – Transport of injured	Demonstrate the transport of the injured in simulated setting	P/2	Desirable to know	Skill lab training Audiovisual aid	OSCE	OSC E	

### 6.3. Head injury; Examination of head injury case-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 3.1	KS	K	Head injury and intracranial pressure	State the Monro Kellie doctrine about intracranial pressure	C/1	Nice to know	Lecture	Viva	SAQ	--
				Enumerate the causes of raised intracranial pressure	C/2	Must know	Lecture		SAQ	
Hom UG-Sur-I 3.2	KS	KH	Head injury pathophysiology, types	Describe Pathophysiology of head injuries  Explain different types of head injuries like concussion, skull fracture, intracranial haemorrhage and diffuse axonal injuries	C/2  C/2	Must know  Must know	Lecture Audiovisual aid Small group discussion Case based discussion	Viva Clinical simulation	MCQ SAQ	
Hom UG-Sur-I 3.3	KS	KH	Assessment of head injury	Describe Glasgow coma scale	C/1	Must know	Lecture/ small group discussion	Viva OSCE Mini-CEX	MCQ SAQ LAQ	

				Discuss the neurological assessment of a patient with head injuries	C/2	Must know	Audiovisual mode Clinical simulation			
Hom UG-Sur-I 3.4	KS	KH	Investigations and management of head injury	Enumerate the appropriate investigations to be done in case of head injury	C/2	Must know	Lecture/ small group discussion Audio visual aid	Viva Audiovisual aids	LAQ	Radiology
	HO	KH	Homoeopathic therapeutics for head injury	Discuss the Homoeopathic therapeutics for head injuries	C/1	Must know			SAQ	Materia Medica

#### 6.4. Injury to chest and abdomen; Examination of chest and abdominal injury -

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 4.1	KS	KH	Clinical features, investigations and management of chest injuries	Describe the clinical features of chest injuries	C/2	Must know	Lecture Audiovisual aid Case based studies	Viva OSCE	SAQ LAQ	
				List the appropriate investigations required in a case of chest injury	C/2	Must know				
				Discuss the management of chest injury	C/2	Desirable to know				
Hom UG-Sur-I 4.2	KS	KH	Chest injuries - flail chest and stove-in chest	Define flail chest	C/1	Must know	Lecture Audiovisual aid	Viva	MCQ SAQ	
				Explain the clinical features of flail chest	C/2	Must know				
				Discuss the management of flail chest	C/2	Desirable to know				
				Explain stove-in chest	C/2	Nice to know				

Hom UG- Sur-I 4.3	KS	KH	Chest injuries -tension pneumothorax	<p>Define tension pneumothorax</p> <p>Enumerate the cause of tension pneumothorax</p> <p>Discuss the clinical features of tension pneumothorax</p> <p>Discuss the management of tension pneumothorax</p>	<p>C/1</p> <p>C/2</p> <p>C/2</p> <p>C/2</p>	<p>Must know</p> <p>Must know</p> <p>Must know</p> <p>Must know</p>	<p>Lecture</p> <p>Small group discussion</p> <p>Audiovisual aid</p> <p>Skill lab simulation</p>	Viva OSCE	SAQ LAQ MCQ	
Hom UG- Sur-I 4.4	KS	KH	Chest injury - Thoracotomy	<p>Enumerate the indications for Emergency thoracotomy</p>	C/2	Desirable to know	Lecture	Viva	SAQ	
Hom UG- Sur-I 4.5	KS	KH	Abdominal injury - Clinical features, investigations and management of abdominal injuries	<p>Explain the clinical presentations of blunt abdominal trauma</p> <p>Enumerate the relevant investigations to be advised in a case of blunt abdominal trauma</p>	<p>C/2</p> <p>C/2</p>	<p>Must know</p> <p>Must know</p>	<p>Lecture</p> <p>Audiovisual aid</p> <p>Small group discussion</p>	Viva OSCE	MCQ SAQ LAQ	

				Discuss the surgical management of blunt abdominal trauma	C/2	Desirable to know				
Hom UG-Sur-I 4.6	KS	KH	Abdominal injuries-splenic trauma	Describe the clinical presentation of splenic trauma	C/2	Must know	Lecture Audio visual aid Small group discussion	Viva OSCE	MCQ SAQ LAQ	
				Discuss the diagnosis of splenic trauma	C/2	Must know				
				Discuss the management of splenic trauma	C/2	Desirable to know				
Hom UG-Sur-I 4.7	KS	KH	Abdominal injuries-Hepatic trauma	Describe the clinical presentation of Hepatic trauma	C/2	Must know	Lecture Audiovisual aid Small group discussion	Viva	MCQ SAQ LAQ	
				Discuss the diagnosis of Hepatic trauma	C/2	Must know				
				Discuss the management of Hepatic trauma	C/2	Desirable to know				
Hom UG-Sur-I 4.8	KS	KH	Abdominal injuries-pancreaticoduodenal trauma	Describe the clinical presentation of pancreaticoduodenal trauma	C/2	Must know	Lecture Audiovisual aid	Viva	MCQ SAQ LAQ	



				Discuss the diagnosis of pancreaticoduodenal trauma	C/2	Desirable to know	Small group discussion			
				Discuss the management of pancreaticoduodenal trauma	C/2	Nice to know				
Hom UG-Sur-I 4.9	KS	KH	Abdominal injuries- Renal trauma	Explain the clinical presentations of renal trauma	C/2	Must know	Lecture Audiovisual aid Small group discussion	Viva	MCQ SAQ LAQ	
				Discuss the diagnosis of renal trauma	C/2	Desirable to know				
				Discuss the management of renal trauma	C/2	Nice to know				

### 6.5. Wounds and wound healing; Scar and keloid; Examination of wounds-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 5.1	KS	K	Types of wounds	Discuss various types of closed wounds  Discuss various types of open wounds	C/1	Must know  Must know	Lecture Small group discussion	Viva	MCQ SAQ	FMT
Hom UG-Sur-I 5.2	KS	KH	Wound healing process and its types	Discuss the various stages of wound healing  Discuss the factors affecting the wound healing  Discuss the types of wound healing	C/1  C/2  C/2	Must know  Desirable to know  Must know	Lecture Audiovisual aid Small project	Viva	SAQ MCQ	Pathology
Hom UG-Sur-I 5.3	PBL	SH	Examination of wound	Demonstrate the evaluation and assessment of wound	P/2	Must know	Audiovisual aid Case based discussion DOPS	Viva Clinical performance OSCE		

Hom UG- Sur-I 5.4	KS       PBL	KH       SH	Wound manageme nt	Describe the principles acute wound management    Demonstrate cleaning and dressing of wound	C/2       P/2	Must know	Lecture Audio-video mode Skill lab simulation Clinical Demonstration Wound dressing Audiovisual aid Small group discussion DOPS Small project	Viva       Clinical performanc e OSCE	SAQ	--
Hom UG- Sur-I 5.5	KS	K       KH       KH	Surgical site infections	Classify surgical site infections.    Enumerate the risk factors of surgical site infections   Discuss the clinical presentation of surgical site infections	C/1       C/2       C/ 2	Must know       Must know       Must know	Lecture Audiovisual aid Small group	Viva	MCQ SAQ LAQ	Pathology

	HO	KH	Homeopathic management of surgical site infections	Discuss the scope of Homoeopathy in surgical site infections.  Discuss the Homeopathic therapeutics for surgical site infections	C/1  C/1	Must know  Must know				
Hom UG-Sur-I 5.6	HO	KH	Wound management	Discuss the homoeopathic therapeutics for various types of injuries	C/2	Must know	Lecture	Viva	SAQ	Materia Medica Repertory
Hom UG-Sur-I 5.7	PBL	K   SH   KH	Wound management	Enumerate different types of Suture materials  Demonstrate different types of Suture / knotting techniques  Discuss the Principles of anastomosis	C/2  P/2  C/2	Desirable to know  Nice to know  Nice to know	Tutorial Small project  Skill lab simulation Audiovisual aid DOAP  Tutorial Audiovisual aid	Viva	SAQ	

Hom UG- Sur-I 5.8	KS	KH	Scars and keloid	Describe hypertrophic scar and keloid	C/2	Must know	Lecture	Viva	SAQ	
	HO			Discuss the management of Scars and Keloid along with Homoeopathic Therapeutics	C/2	Must know	Lecture	Viva	SAQ	Materia Medica

#### 6.6. Haemorrhage, blood transfusion; Examination of a haemorrhagic case -

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbe rt	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- Sur-I 6.1	KS	K	Types of haemorrha ge	Enumerate types of haemorrhage	C/2	Must know	Lecture	Viva	MCQ SAQ	
Hom UG- Sur-I 6.2	KS	KH	Manageme nt of haemorrha ge	Explain the basic concepts of hemostasis and mechanism of Haemostasis	C/1	Nice to know	Lecture Audiovisual aid	Viva	SAQ LAQ	Physiology
Hom UG- Sur-I 6.3	HO	KH	Management of haemorrhage with homoeopathy	Discuss homoeopathic therapeutics for haemorrhage	C/2	Must know	Lecture	Viva	SAQ	Materia Medica Repertory

Hom UG- Sur-I 6.4	KS	KH	Blood transfusion and blood products	Enumerate the Indications for blood transfusion	C/1	Must know	Lecture Small group discussion OSCE Small project	Viva	SAQ	Pathology
				Explain the complications of blood transfusion	C/2	Must know		Viva	MCQ SAQ	
				Describe various blood products and appropriate indications for their use	C/2	Desirable to know				
Hom UG- Sur-I 6.5	KS	KH	Examination of haemorrhagic case	Discuss the assessment of patient with haemorrhage	C/1	Must know	Audiovisual aid Clinical demonstration Small group discussion DOPS	Viva OSCE	SAQ	
	PBL	SH		Demonstrate examination of a haemorrhagic case	P/2					
Hom UG- Sur-I 6.6	PBL	S	Blood transfusion procedure	Observe blood transfusion procedure	P/1	Nice to know	Observing blood transfusion procedure	Logbook	--	--

### 6.7. Shock; Examination of shock -

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom / Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 7.1	KS	KH	Shock types, pathophysiology	Define shock	C/1	Must know	Lecture	Viva	MCQ SAQ LAQ	Pathology Physiology
				Enumerate the various types of shock	C/2	Must know	Lecture			
				Explain the pathophysiology of shock	C/2	Desirable to know	Lecture Audiovisual aid			
Hom UG-Sur-I 7.2	KS	KH	Clinical features, investigations and management of shock	Explain the clinical features of shock	C/2	Must know	Lecture Audiovisual aid Small group discussion	Viva OSCE	MCQ SAQ LAQ	Pathology Practice of Medicine
				Discuss the diagnosis of various types of shock	C/2	Must know				
				Explain the complications of shock.	C/2	Must know				

				Discuss the management of shock	C/2	Must know				
Hom UG-Sur-I 7.3	HO	KH	Homeopathic therapeutics for shock	Discuss the homoeopathic therapeutics for shock	C/1	Must know	Lecture Small group discussion	Viva	SAQ	Materia Medica

#### 6.8. Fluid, electrolyte and acid base balance; Clinical examination and evaluation-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 8.1	KH	K	Fluid, electrolyte and acid base balance	Describe the fluid compartments of the body	C/1	Desirable to know	Tutorial	Viva	MCQ SAQ	Pathology Physiology
Hom UG-Sur-I 8.2	KH	KH	Fluid, electrolyte and acid base balance	Identify the indications of fluid replacement	C/2	Must know	Lecture Small group discussion Small project	Viva OSCE	SAQ	Biochemistry
				Discuss the methods of estimation and replacement the Fluid and electrolyte in the surgical patient	C/2	Desirable to know				



Hom UG- Sur-I 8.3	KH	KH	Acid base balance	Enumerate the causes of metabolic acidosis	C/2	Must know	Lecture Small group discussion	Viva	MCQ SAQ	Biochemistry Pathology
				Describe the clinical features and laboratory findings of metabolic acidosis	C/2	Must know				
				Discuss the management of metabolic acidosis	C/2	Must know				
Hom UG- Sur-I 8.4	KH	KH	Acid base balance	Enumerate the causes of metabolic alkalosis	C/2	Must know	Lecture Small group discussion	Viva	MCQ SAQ	Biochemistry Pathology
				Describe the clinical features and laboratory findings of metabolic alkalosis	C/2	Must know				
				Discuss the management of metabolic alkalosis	C/2	Must know				

Hom UG- Sur-I  8.5	KS	KH	Acid base balance	Enumerate the causes of respiratory acidosis	C/2	Must know	Lecture Small group discussion	Viva	MCQ SAQ	Biochemistry Pathology
				Describe the clinical features and laboratory findings of respiratory acidosis	C/2	Must know				
				Discuss the management of respiratory acidosis	C/2	Must know				
Hom UG- Sur-I  8.6	KS	KH	Acid base balance	Enumerate the causes of respiratory alkalosis	C/2	Must know	Lecture Audiovisu al aid	Viva	MCQ SAQ	Biochemistry Pathology
				Describe the clinical features and laboratory findings of respiratory alkalosis	C/2	Must know				
				Discuss the management of respiratory alkalosis	C/2	Must know				

Hom UG- Sur-I 8.7	KS	KH	Electrolyte balance – Potassium	Enumerate causes of Hyperkalemia  Describe the clinical features and diagnosis of hyperkalemia  Discuss the management of Hyperkalemia	C/2  C/2  C/2	Must know  Must know  Must know	Lecture Small group discussion	Viva	SAQ	Biochemistry Practice of Medicine
Hom UG- Sur-I 8.8	KS	KH	Electrolyte balance – Potassium	Enumerate causes of Hypokalemia  Describe the clinical features and diagnosis of hypokalemia  Discuss the management of Hypokalemia	C/2  C/2  C/2	Must know  Must know  Must know	Lecture Small group discussion	Viva	SAQ	Biochemistry Practice of Medicine
Hom UG- Sur-I	KS	KH	Electrolyte balance – Sodium	Enumerate causes of Hypernatremia	C/2	Must know	Lecture	Viva	SAQ	Biochemistry Practice of Medicine

8.9				Describe the clinical features and diagnosis of hypernatremia	C/2	Must know	Small group discussion			
				Discuss the management of Hyponatremia	C/2	Must know				
Hom UG-Sur-I 8.10	KS	KH	Electrolyte balance – Sodium	Enumerate causes of Hyponatremia	C/2	Must know	Lecture Small group discussion	Viva	SAQ	Biochemistry Practice of Medicine
				Describe the clinical features and diagnosis of hyponatremia	C/2	Must know				
				Discuss the management of Hyponatremia	C/2	Must know				
Hom UG-Sur-I 8.11	KS	K	Electrolyte balance – Calcium	Enumerate causes of Hypercalcemia	C/2	Must know	Lecture Small group discussion	Viva	SAQ	Biochemistry Practice of Medicine
				Describe the clinical features and	C/2	Desirable to know				

				diagnosis of hypercalcemia  Discuss the management of Hypercalcemia	C/2	Nice to know				
Hom UG- Sur-I  8.12	KS	K	Electrolyte balance – Calcium	Enumerate causes of Hypocalcemia  Describe the clinical features and diagnosis of hypocalcemia  Discuss the management of Hypocalcemia	C/2  C/2  C/2	Must know  Desirable to know  Nice to know	Lecture	Viva	SAQ	Biochemistry Practice of Medicine

Hom UG- Sur-I  8.13	PBL	KH	Fluid, electrolyte and acid base balance	Describe the assessment of fluid, electrolyte and acid base balance in a surgical case	P/2	Must know	Case demonstration	Clinical performance Case based discussion Assignments	----	
		SH		Fluid replacement therapy	P/2		Skill lab, Simulation Clinical bedside training DOPS		----	

#### 6.9. Burns, skin grafting; Clinical examination-

SL No	Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- Sur-I 9.1	KS	K	Burns and skin grafting	Describe the pathophysiology of burns	C/2	Must know	Lecture Audiovisual aid Skill lab simulation	Viva OSCE	MCQ SAQ LAQ	Physiology
		KH		Discuss the assessment of burn wound. Assessing size and depth of burns	C/2	Must know				

				Explain the principles of fluid resuscitation in burns cases	C/2	Desirable to know				
				Discuss the management of burn wound	C/2	Must know				
Hom UG-Sur-I 9.2	HO	KH	Burns and skin grafting	Discuss the scope of Homoeopathy in the management of burns  Discuss the homoeopathic therapeutics for burns	C/2	Must know	Lecture small group discussion	Viva	SAQ	Materia Medica Repertory
Hom UG-Sur-I 9.3	PBL	SH	Burns and skin grafting	Examination of case of burns  Assessment of burn wound	P/2	Desirable to know	Simulation and skill lab training DOPS	Logbook OSCE	--	--

Hom UG- Sur-I 9.4	KS	K	Burns and skin grafting	Enumerate the indications for skin grafting  Describe the various types of skin grafting	C/2	Desirable to know	Lecture Audiovisual aid	Viva	SAQ	
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#### 6.10. Nutrition-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- Sur-I 10.1	KS	KH	Nutrition	Enumerate the causes of malnutrition in surgical patients	C/1	Must know	Lecture Small group discussion	Viva	SAQ	Physiology
				Discuss the consequences of malnutrition in surgical patient.	C/2	Desirable to know		Viva	SAQ	
Hom UG- Sur-I 10.2	KS	KH	Nutrition	Discuss the nutritional requirements of surgical patients	C/2	Must know	Lecture Audiovisual aid	Viva	SAQ	Physiology



				Explain the methods of providing nutritional support.			Skill lab simulation			
Hom UG-Sur-I 10.3	PBL	SH	Nutrition	Demonstrate various types artificial nutritional support in surgical patients	P/2	Desirable to know	Simulation skill lab Small project DOPS	Viva OSCE DOPS		

#### 6.11. Common surgical infections; Examination of common surgical infections-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 11.1	KS	K	Boil	Define boil	C/1	Must know	Lecture	Viva	MCQ SAQ	Pathology
		KH		Discuss clinical features complications of boil	C/2					
Hom UG-Sur-I 11.2	KS	KH	Carbuncle	Define carbuncle	C/1	Must know	Lecture Audiovisual mode	Viva	MCQ SAQ	Pathology
				Describe the pathology of carbuncle	C/2	Must know				
				Discuss the clinical features complications of carbuncle	C/2	Must know				

Hom UG- Sur-I 11.3	KS	KH	Abscess	Define abscess	C/1	Must know	Lecture Audiovisual aid	Viva	MCQ SAQ	Pathology
				Enumerate the various types of abscesses	C/2					
				Explain clinical features of abscess	C/2					
				Discuss the management of abscess	C/2					
Hom UG- Sur-I 11.4	KS	KH	Cellulitis and erysipelas	Define cellulitis	C/1	Must know	Lecture Audiovisual aid	Viva	SAQ MCQ	Pathology
				Explain clinical features of cellulitis	C/2	Must know				
				Define erysipelas	C/1	Must know				
				Explain the clinical features of erysipelas	C/2	Must know				

				Discuss the difference between cellulitis and erysipelas	C/2	Must know				
Hom UG-Sur-I 11.5	KS	KH	Hidradenitis suppurativa	Discuss the pathology of Hidradenitis suppurativa  Explain the clinical features of Hidradenitis suppurativa	C/2  C/2	Must know  Must know	Lecture	Viva	SAQ MCQ	Pathology
Hom UG-Sur-I 11.6	KS	K	Septicaemia and pyaemia	Define septicaemia.  Enumerate the causes of septicemia discuss the clinical features of septicaemia	C/1  C/2	Must know  Must know	Lecture Small group discussion	Viva	LAQ SAQ MCQ	Pathology
Hom UG-Sur-I 11.7	KS	K	Systemic inflammatory response syndrome	Define systemic inflammatory response syndrome (SIRS)	C/1	Must know	Lecture Audiovisual aid	Viva	LAQ SAQ MCQ	Pathology

		KH		Discuss the pathophysiology of SIRS	C/2	Desirable to know				
Hom UG-Sur-I 11.8	PBL	SH	Common surgical infections	Demonstrate the examination of a case of common surgical infections like boil, carbuncle, cellulitis, erysipelas, hydradenitis suppurativa etc	P/2	Must know	Small group discussion Clinical demonstration DOPS	Viva OSCE DOPS	Case based discussion Log book	
Hom UG-Sur-I 11.9	HO	K	Common surgical infections	Discuss the therapeutics with specific indications for common surgical infections like boil, carbuncle, cellulitis, erysipelas and hidradenitis suppurativa	C/2	Must know	Lecture	Viva	SAQ MCQ	Materia Medica Repertory

Hom UG- Sur-I 11.10	HO	KH	Common surgical infections Septicaemia and pyaemia	Discuss the role of Homoeopathy in septicemia and pyaemia  Discuss the homoeopathic therapeutics for septicemia and pyaemia	C/2	Must know	Lecture Small group discussion	Viva	SAQ	Materia Medica Repertory
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#### 6.12. Special infections; Clinical examination-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Gilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- Sur-I 12.1	KS	KH	Tuberculosis	Describe the pathology of tuberculosis	C/1	Desirable to know	Lecture Audiovisual aid Small group discussion	Viva	LAQ SAQ MCQ	Pathology Practice of Medicine
				Explain the clinical features of tuberculosis	C/2	Must know				
					C/2	Must know				

				Discuss the diagnosis of tuberculosis						
Hom UG-Sur-I 12.2	KS	KH	Syphilis	Describe the pathology of syphilis  Explain the types and clinical features of Syphilis	C/1  C/2	Desirable to know  Must know	Lecture Audiovisual aid	Viva	LAQ SAQ MCQ	Pathology Practice of Medicine
Hom UG-Sur-I 12.3	KS	KH	AIDS	Discuss the pathogenesis of AIDS  Explain the clinical features of AIDS	C/1  C/2	Desirable to know  Must know	Lecture	Viva	LAQ SAQ MCQ	Pathology Practice of Medicine
Hom UG-Sur-I 12.4	KS	KH	Actinomycosis	Discuss the pathogenesis of Actinomycosis  Describe the clinical features of Actinomycosis	C/2  C/2	Desirable to know  Must know	Lecture	Viva	LAQ SAQ MCQ	Pathology Practice of Medicine
Hom UG-Sur-I 12.5	KS	KH	Leprosy	Discuss the pathogenesis of leprosy	C/1	Desirable to know	Lecture	Viva	LAQ SAQ MCQ	Pathology Practice of Medicine

				Explain the types and clinical features of leprosy	C/2	Must know				
Hom UG-Sur-I 12.6	KS	KH	Tetanus	Discuss the pathogenesis of Tetanus	C/1	Desirable to know	Lecture	Viva	LAQ SAQ MCQ	Pathology Practice of Medicine
				Explain the clinical features of Tetanus	C/2	Must know				
Hom UG-Sur-I 12.7	KS	KH	Infective gangrene	Define gangrene.	C/1	Must know	Lecture Audiovisual aid Small group discussion Case based discussion	Viva	LAQ SAQ MCQ	Pathology Practice of Medicine
				Enumerate the causes of gangrene	C/2	Must know				
				Discuss the clinical types of gangrene.	C/2	Must know				
				Describe the clinical features	C/2	Must know				
				Discuss the management of gangrene	C/2	Must know				

Hom UG- Sur-I 12.8	HO	K	Special infections	Discuss the homoeopathic therapeutics for special infections like Tuberculosis, Syphilis, AIDS, Actinomycosis, Leprosy and tetanus	C/2	Must know	Lecture/ small group discussion	Viva	SAQ MCQ	Materia Medica Repertory
Hom UG- Sur-I 12.9	HO	KH	Special infections – gangrene	Discuss the Homoeopathi c therapeutics for Gangrene	C/1	Must know	Lecture/ small group discussion	Viva	SAQ MCQ	Materia Medica Repertory
Hom UG- Sur-I 12.1 0	PBL	SH	Special infections – gangrene	Demonstrate the Examination of case of gangrene	P/2	Must know	Clinical demonstration Audiovisual aid Skill lab training	Case based discussio n OCSE	OSCE	

### 6.13. Concept of swelling- Tumours and Cysts; Clinical examination of swelling-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG- Sur-I 13.1	KS	K	Swelling concept	Define Tumour	C/1	Must Know	Lecture	Viva	MCQ	Pathology



Hom UG- Sur-I 13.2	KS	KH	Tumours	Discuss the differences between benign and malignant tumours  Differentiate different tumours like sarcoma, Fibrosarcoma, Naevus, Melanoma etc	C/2	Must Know	Lecture  Audiovisual aid	Viva	SAQ  LAQ	Pathology
Hom UG- Sur-I 13.3	HO	K	Tumours	Discuss Homoeopathic Therapeutics of Tumour	C/2	Must Know	Lecture	Viva	MCQ SAQ	Pathology  Organon: Miasm  Materia Medica
Hom UG- Sur-I 13.4	KS	K	Cyst	Define Cyst	C/1	Must Know	Lecture	Viva	MCQ	Pathology
Hom UG- Sur-I 13.5	KS	KH	Cyst	Explain Types of Cyst	C/2	Must Know	Lecture  Audiovisual aid	Viva	SAQ LAQ	Pathology

Hom UG- Sur-I 13.6	HO	K	Cyst	Discuss the homoeopathic therapeutics for Cyst	C/2	Must Know	Lecture	Viva	MCQ SAQ	Pathology Organon: Miasm Materia Medica
Hom UG- Sur-I 13.7	KS	KH	Lipoma, Fibroma, Adenoma, Neuroma, Neurofibro ma, Haemangio ma	Explain Lipoma, Fibroma, Adenoma, Neuroma, Neurofibroma, Haemangioma	C/2	Must Know	Lecture  Audiovi sual aid	Viva	SAQ LAQ MCQ	Pathology
Hom UG- Sur-I 13.8	HO	KH	of Lipoma, Fibroma, Adenoma, Neuroma, Neurofibr oma, Haemangi oma	Discuss the Homoeopathic therapeutics of Lipoma, Fibroma, Adenoma, Neuroma, Neurofibroma, Haemangioma	C/2	Must Know	Lecture  Small group discussi on	Viva	MCQ SAQ LAQ	Pathology  Organon: Miasm Materia Medica
Hom UG- Sur-I 13.9	PBL	SH	Tumour & Swelling	Demonstrate examination of Tumour and swelling of different types	P/2	Must Know	Clinical demonstra tion  DOPS  Small group discussion	OSCE	Mini- cex  OSCE	

**6.14. Hernia - Abdominal hernias, Basic Anatomy, Types causes, Clinical features Complications, Management; Examination of hernia case-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 14.1	KS	K  KH	Hernia	Define Hernia	C/1	Must Know	Lecture	Viva	MCQ	Anatomy , Pathology
				Enumerate the causes of hernia	C/2		Audiovisual aids		SAQ	
				Discuss the clinical classification of hernias	C/2	Must know	Small group discussion		LAQ	
				Discuss the principles of management of hernias	C/2	Must know				
				Discuss the operative approaches to hernias	C/2	Desirable to know  Nice to know				
Hom UG-Sur-I 14.2	KS	KH	Inguinal hernia	Describe the basic anatomy of inguinal canal	C/1	Must know	Lecture  Audiovisual aid  Small group discussion	Viva	MCQ  SAQ  LAQ	Anatomy

				Discuss the types, clinical presentation and diagnosis of inguinal hernia	C/2	Must know				
				Discuss the surgical management of inguinal hernia	C/2	Nice to know				
Hom UG-Sur-I 14.3	KS	KH	Femoral hernia	Describe the basic anatomy of femoral canal  Discuss the clinical features and diagnosis of femoral hernia  Discuss the surgical management of Femoral hernia	C/1  C/2  C/2	Must know  Must know  Nice to know	Lecture  Audiovisual aids  Small group discussion	Viva	MCQ SAQ LAQ	Anatomy
Hom UG-Sur-I 14.4	KS	KH	Umbilical hernia	Describe the various types of umbilical hernia Discuss the clinical features and diagnosis of Umbilical hernia	C/2  C/2	Must know  Must know	Lecture  Audiovisual aids	Viva	MCQ SAQ LAQ	

Hom UG- Sur-I 14.5	KS	KH	Epigastric hernia	Explain the pathology of epigastric hernia  Describe the clinical features of epigastric hernia	C/2  C/2	Must know  Must know	Lecture  Audiovisual aids	Viva	MCQ SAQ LAQ	
Hom UG- Sur-I 14.6	KS	KH	Incisional hernia	Describe etiology of incisional hernia  Discuss the clinical features of incisional hernia  Discuss the management of incisional hernia	C/2  C/2  C/2	Must know  Must know  Nice to know	Lecture  Audiovisual aids	Viva	MCQ SAQ LAQ	
Hom UG- Sur-I 14.7	KS	KH	Spigelian hernia	Explain spigelian hernia	C/2	Desirable to know	Lecture Audiovisual aids	Viva	MCQ SAQ	
Hom UG- Sur-I 14.8	KS	KH	Lumbar hernia	Explain lumbar hernia	C/2	Desirable to know	Lecture Audiovisual aids	Viva	MCQ SAQ	

Hom UG- Sur-I 14.9	KS	KH	Traumatic hernia	Explain traumatic hernia	C/2	Desirable to know	Lecture Audiovisual aids	Viva	MCQ SAQ	
Hom UG- Sur-I 14.10	KS	KH	Obturator hernia	Explain obturator hernia	C/2	Desirable to know	Lecture Audiovisual aids	Viva	MCQ SAQ	
Hom UG- Sur-I 14.11	HO	KH	Hernia	Discuss the Homoeopathic Therapeutics for Hernia	C/2	Must Know	Lecture Small group discussion	Viva	MCQ/ SAQ/ LAQ	Pathology Organon: Miasm Materia Medica
Hom UG- Sur-I 14.12	PBL	SH	Hernia	Demonstrate examination of hernia	P/2	Must Know	Clinical demonstration DOPS Small group discussion	OSCE Mini-cex	Mini-cex	

### 6.15. Ulcers; Clinical examination of ulcer-

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 15.1	KS	K	Ulcer	Define Ulcer	C/1	Must Know	Lecture	Viva	MCQ	Pathology Organon: Miasm Materia Medica
Hom UG-Sur-I 15.2	KS	KH	Ulcer	Describe different classification of Ulcer	C/2	Must Know	lecture	Viva	MCQ SAQ LAQ	Pathology
Hom UG-Sur-I 15.3	HO	KH	Ulcer	Explain therapeutics of ulcer	C/1	Must Know	Lecture/ Small group discussion	Viva	MCQ/SAQ/LAQ	Pathology Organon: Miasm Materia Medica
Hom UG-Sur-I 15.4	PBL	SH	Ulcer	Demonstrate examination of ulcer	P/2	Must Know	Clinical demonstration DOPS OSCE Small group discussion	OSCE Mini-cex	OSCE Mini-cex	

**6.16. Sinus and Fistula; Clinical examination of Sinus and Fistula-**

Sl. No.	Domain of Competency	Miller	Content	SLO	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								F	S	
Hom UG-Sur-I 16.1	KS	K	Sinus and Fistula	Define sinus and fistula	C/1	Must Know	Lecture	Viva	MCQ	Pathology
Hom UG-Sur-I 16.2	KS	KH	Sinus and Fistula	Explain sinus and fistula	C/2	Must Know	Lecture	Viva	MCQ SAQ LAQ	Pathology  Organon: Miasm  Materia Medica
Hom UG-Sur-I 16.3	PBL	SH	Sinus and Fistula	Demonstrate examination of sinus and fistula	P/2	Must Know	Clinical demonstration  DOPS  Small group discussion	OSCE	OSCE	
Hom UG-Sur-I 16.4	HO	K	Sinus and Fistula	Explain therapeutics of sinus and fistula	C/1	Must Know	Lecture  Small group discussion	Viva	MCQ SAQ LAQ	Organon: Miasm  Materia Medica



## 7. Teaching learning methods

Lectures (Theory)	Non-lectures (Practical/Demonstrative)
Lectures	Clinical demonstration
Small group discussion	Problem based discussion
Integrated lectures	Case based learning
	Assignments
	Library reference
	Self-learning

## 8. Details of assessment

***Note-*** The assessment in II BHMS shall be done only as Internal Assessment (IA) in terms of Periodical Assessments ( PA) and Term Tests (TT) as detailed below. There shall not be any Final University Examination (FUE) at this level. The marks obtained in IA during II BHMS will be added to the marks of IA in the III BHMS University Examination.

### Overall Scheme of Internal Assessment (IA)\*

Professional Course/ Subject	Term I (1-6 Months)		Term II (7-12 Months)	
II BHMS/	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	TT II (end of 12 months)

Practice of Medicine	20 Marks Viva- <b>A</b>	100 Marks Clinical/Practical and Viva - <b>E</b>  i) Viva voce -50 marks ii) Clinical/practical- 50 Surgical Case taking - 25marks (Mandatory);  Examination of wound/Cleaning and dressing of wound/Demonstration of Steps of Basic life support/Transport of the injured /Demonstration of suturing technique. ( <i>Demonstration of any one of the procedures mentioned</i> ) – 25 marks	20 Marks Viva- <b>B</b>	100 Marks Clinical/Practical and Viva - <b>F</b>  i) Viva voce -50 marks ii) Clinical/practical- 50 Surgical case taking and  Examination of surgical case – 15+15=30 marks;  Surgical case file (5 cases)-20 marks
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**\*Method of Calculation of Internal Assessment Marks in II BHMS for Final University Examination to be held in III BHMS:**

Marks of PA I	Marks of PA II	Periodical Assessment Average PA I+ PA II /2	Marks of TT I	Marks of TT II	Terminal Test Average TT I + TT II / 200 x 20	Final Internal Assessment Marks
<b>A</b>	<b>B</b>	<b>D</b>	<b>E</b>	<b>F</b>	<b>G</b>	<b>D+G/2</b>

## 9. List of recommended text/reference books

- Williams, N., O'Connell, P. R., & McCaskie, A. (2018).
- *Bailey and Love's Short Practice of Surgery, 27th Edition: the Collector's Edition*. Chapman and Hall/CRC.
- Sriram Bhat. (2019). *SRB's manual of surgery*. Jaypee Brothers.
- A concise text book of surgery, 11<sup>th</sup> edition – S Das
- Das, S. (2024). *A Manual on Clinical Surgery*. Jaypee Brothers Medical Publishers Pvt Limited.
- Sriram, B. M. (2019). *SRB's clinical methods in surgery*. Jaypee Brothers Medical Publishers.
- Kulkarni, S. (2002). *Surgery Therapeutics*. B. Jain Publishers.
- Lilienthal, S. *Homoeopathic Therapeutics*.
- Willis Alonzo Dewey. (2018). *Practical Homeopathic Therapeutics*. B. Jain Publishers.

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**Subject name:** Gynaecology and Obstetrics

**Subject code:** HomUG-ObGy-I

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## **1. Preamble**

Obstetrics stands at the forefront of maternal health, emphasizing the care and well-being of expectant mothers throughout pregnancy, childbirth, and the postpartum period. From prenatal care to labour and delivery, obstetricians play a pivotal role in ensuring safe pregnancies and healthy births. Gynaecology encompasses the diagnosis and treatment of conditions affecting the female reproductive system, from adolescence through menopause, including menstrual disorders, fertility concerns, sexually transmitted infections, and gynecological cancers. Infant care extends beyond the moment of birth, encompassing the critical early stage of a newborn's life. From breastfeeding guidance to newborn screening and immunization.

The fields of Obstetrics, Infant care and Gynaecology intersect to provide holistic care to women across the reproductive lifespan. By addressing the physical, emotional and social aspects of women's health, healthcare providers empower individuals to make informed decisions about their bodies and well-being. In the realm of obstetrics and gynaecology, homoeopathy offers a holistic approach that seeks to address the physical, emotional and spiritual aspects of women's health.

Homoeopathy, a system of medicine based on the principle of "like cures like" and individualized treatment, can play a significant role in promoting well-being and managing various conditions in obstetrics and gynaecology. Homoeopathy offers safe and gentle remedies to support women throughout pregnancy. From alleviating common discomforts such as nausea, fatigue, and back pain to addressing emotional concerns like anxiety and mood swings, homoeopathic treatments can provide relief without adverse effects on the developing fetus. Additionally, homoeopathy can aid in preparing the mother's body for labor and delivery, promoting a smooth and natural

In the postpartum period, homeopathy offers support for new mothers as they navigate the physical and emotional changes following childbirth, and breastfeeding difficulties, promote lactation, and support the overall recovery of the mother. Homeopathy provides a holistic approach to managing various gynaecological conditions, including menstrual disorders, hormonal imbalances, polycystic ovarian syndrome (PCOS), endometriosis, and menopausal symptoms. Homeopathy considers the individual's unique constitution and emotional state.

In conclusion, homoeopathy offers a holistic and patient-centred approach to obstetrics and gynaecology, addressing the physical, emotional, and spiritual aspects of women's health.

## **2. Course outcomes**

At the end of BHMS II course, the students should be able to-

- i. Understand applied anatomy, endocrinology and physiology including abnormality of female reproductive system during puberty, menstruation, menopause and in different stages of womanhood.
- ii. Learn skills in case taking, physical examination, diagnostic procedures and managements of benign and malignant conditions, trauma, infections and inflammations related with female genitalia, and pre-malignancy screening procedures.
- iii. Integrate the various knowledges to get a holistic understanding of disease evolution and approach to disease diagnosis and management.
- iv. Understand developmental anomalies, uterine displacements and Sex and intersexuality
- v. Understand the causes related with male and female Infertility, their diagnosis, Artificial Reproductive Techniques and skill in Homoeopathic management along with population dynamics and control of Conception.
- vi. Know skills required in case taking, clinical examination and common diagnostic modalities in Gynecology and Obstetrics.
- vii. Understand the process of normal pregnancy and minor ailments during pregnancy
- viii. Comprehend the process of diagnosis of normal pregnancy, prenatal, antenatal, postnatal maternal and fetal surveillance, care of newborn, care of puerperium
- ix. Understanding common problems during abnormal pregnancy and labour to manage it through Homoeopathic perspective including scope, limitations and timely referral.
- x. Comprehending postnatal, puerperal care, diseases of fetus, new-born and medico legal aspects with Homoeopathic perspective.
- xi. Learning general and homoeopathic management of common Gynecological and Obstetric conditions

### **3. Learning objectives**

At the end of the II BHMS course the student shall be able to:

1. Understand the applied anatomy, endocrinology and physiology including abnormality of female reproductive system during puberty, menstruation, menopause and in different stages of womanhood.
2. Integrate the knowledge with Anatomy, Physiology, Organon of medicine, Practice of medicine and Homoeopathic materia medica to get a holistic
3. A understanding of disease evolution and approach to disease diagnosis and management.
4. Discuss the developmental anomalies, Uterine displacements and Sex and intersexuality to understand the Predisposition including fundamental miasm, personality type known to develop particular disease, causation and modifying factors like exciting and maintaining factors.
5. Acquire skill in case taking, clinical examination and common diagnostic modalities in Gynaecology and Obstetrics.
6. Describe anatomical, physiological, endocrinological changes and minor ailments during pregnancy
7. Understand prenatal, antenatal, postnatal maternal and foetal surveillance, care of new-born, care of puerperium
8. Integrate the knowledge with Organon of medicine and Homoeopathic Materia medica for eradicating genetic dyscrasias in the mother and foetus.
9. Describe the mechanism and stages of normal labour, and intra-partum management.
10. Discuss general and Homoeopathic management for the related conditions through integration with repertorisation and therapeutics.

#### 4. Course content and its term-wise distribution

##### 4.1 Unit 1: Gynaecology and Homoeopathic Therapeutics

Sl. No.	List of Topics	Term
1.a	Introduction to Gynaecology with Definition of Hahnemannian classification of disease. Importance in the review of the Homoeopathic literature, Therapeutics and Repertory source books	I
1.b	A review of the applied anatomy of female reproductive system, development and Developmental anomalies	I
1.c	A review of the applied physiology of female reproductive system - Puberty, Menstruation and its disorders including, amenorrhea, dysmenorrhea, menorrhagia, metrorrhagia, epimenorrhoea, AUB, Postmenopausal bleeding and menopause with related ailments and its scope and management in Homoeopathy and integrate wherever necessary with other disciplines	I
1.d	Gynaecological Case taking, physical examination, investigation and approach to clinical diagnosis and Differential diagnosis.	I
1.e	Epidemiology -Predisposition including fundamental miasm: personality type known to develop particular disease	I
1.f	Uterine displacements – Prolapse, Retroversion and inversion with its exciting and maintaining causes, disease manifestations, prognosis, management and scope in homoeopathic perspective.	II
1.g	Sex & Intersexuality- Knowledge and scope to eradicate genetic Dyscrasias, predisposition, miasm and personality types known to develop particular diseases through Homoeopathic outlook.	II
1.h	General and Homoeopathic Management, repertorisation, therapeutics, posology, Formulation of prognostic criteria and Prognosis of related topics in Gynecology.	II



#### 4.2 . Unit 2: Obstetrics, new born care & Homoeopathic therapeutics

Sl. No.	List of topics	Term
2.a	Introduction to Obstetrics and Newborn care related with Homoeopathic Philosophy, Therapeutics and Repertorisation.	I
2.b	Fundamentals of reproduction	I
2.c	Development of intra uterine pregnancy	I
2.d	Diagnosis of pregnancy, investigations & examinations, applied anatomy & physiology, Normal pregnancy – physiological changes	I
2.e	Antenatal care – aims, objectives, visits, advise, procedures, investigations, identifying high risk cases, scope and limitation of management in Homoeopathy	I
2.f	Common conditions such as Vomiting, backache, constipation in pregnancy and Homoeopathic management	I
2.g	Normal labour with its causes of onset, anatomy, physiology, mechanism, stages, events and clinical course in each stage, importance of Homoeopathic scope and management	II
2.h	Postnatal & puerperal cure - scope and limitation of management in Homoeopathy	II
2.i	Care of new born in homoeopathic point of view	II
2.j	General and Homoeopathic Management, repertorisation, therapeutics, posology, Formulation of prognostic criteria and Prognosis of related topics in Obstetrics and new-born care.	II
2.k	Important Investigations for diagnosis in Obstetrics	II

## 5. Teaching hours

### 5.1. Gross division of teaching hours

Gynaecology and Obstetrics		
Year	Teaching hours- Lectures	Teaching hours- Non-lectures
II BHMS	100	24

### 5.2. Teaching hours theory

#### 5.2.1 Unit 1: Gynaecology and Homoeopathic Therapeutics

Sl. No.	List of topics	Lecture hours
1.a	Introduction to Gynecology with definition of Hahnemannian classification of disease. Importance in the review of the Homoeopathic literature, Therapeutics and Repertory source books	02 hrs.
1.b	A review of the applied anatomy of the female reproductive system.	03 hrs.
	Developmental anomalies	03 hrs.
1.c	A review of the applied physiology of the female reproductive system HPO axis & Menstruation	02 hrs.
	Puberty	03 hrs.
	Disorders of Menstruation including – Amenorrhoea, Dysmenorrhoea, Menorrhagia, Metrorrhagia, Epimenorrhoea, AUB.	09 hrs.
	Post-Menopausal Bleeding & Menopause with related ailments	05 hrs.

1.d	Gynaecological case taking, Physical examination, investigation and approach to clinical diagnosis and differential diagnosis.	04 hrs.
1.e	Epidemiology – Predisposition including fundamental miasm; personality type known to develop particular disease.	04 hrs.
1.f	Uterine displacements- Prolapse, retroversion and inversion with its exciting and maintaining causes, disease manifestations, prognosis, management and scope in homoeopathic perspective	08 hrs.
1.g	Sex & Intersexuality – Knowledge and scope to eradicate genetic dyscrasians, predisposition, miasm and personality types known to develop particular diseases through Homoeopathic outlook	05 hrs.
1.h	Correlate homoeopathic remedies, Therapeutics, posology. Formulation of prognostic criteria and prognosis related to Gynaecological conditions.	02 hrs
<b>Total</b>		<b>50 hrs.</b>

#### 5.2.2. Unit 2: Obstetrics, new born care & Homoeopathic therapeutics

Sl. No.	List of topics	Teaching hours
2.a	Introduction to Obstetrics and Newborn Care Related with Homoeopathic Philosophy. Therapeutics and Repertorisation.	02 hr.
2.b	Fundamentals of reproduction	04 hrs.
2.c	Development of intrauterine pregnancy- Placenta and foetus.	04 hrs.
2.d.	Diagnosis of pregnancy: Investigations & examinations, applied anatomy & physiology, Normal pregnancy – Physiological changes.	07 hrs.
2.e	Antenatal care – aims, objectives, visits, advice, procedures, investigations, identifying high-risk cases, scope and limitation of management in Homeopathy	06 hrs.

2.f	Vomiting in pregnancy	04 hrs.
2.g	Normal labour with its causes of onset, anatomy, physiology, mechanism, stages, events and clinical course in each stage and management	08 hrs.
2.h	Postnatal & puerperal cure – scope and limitation of management in Homoeopathy	06 hrs.
2.i	Care of New-born in a homoeopathic point of view	04 hrs.
2.j	Correlate homoeopathic remedies, Therapeutics, posology. formulation of prognostic criteria and prognosis related to Obstetrical conditions	02 hrs.
2.k	Important investigations for diagnosis in Obstetrics	03 hrs.
<b>Total</b>		<b>50 hrs.</b>

### 5.2.3. Teaching hours Non-lecture

S. No.	Non lecture activity	Hours
1.	<b>Clinical</b>	
a.	Gynaecological Case taking	04
b.	Obstetrical Case taking	04
c.	Gynaecological Examination	04
d.	Obstetrical Examination	04
e.	Investigations, Diagnosis , D/D	04
2.	<b>Demonstrative</b>	
a.	Problem based / Case based learning- Foetal skull & maternal pelvis Demonstration of labour in Mannequin - skill lab	04
	<b>Total</b>	<b>24</b>

## 6. Content mapping (competencies tables)

### Unit 1: Gynaecology & Homoeopathic therapeutics

#### 6.1. Introduction to Gynecology with definition of Hahnemannian classification of disease. Importance in the review of the Homoeopathic literature, Therapeutics and Repertory source books

Sl. No.	Domain of Competency	Miller' s level	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 1.1	K & S	K	Introduction to Gynecology	Define Gynaecology	C1	MK	Lecture Small group discussion	MCQ		
HomUG-ObGy-1 1.2	K & S	K	History of Gynaecology	Discuss the history of Gynaecology	C1	NK	Lecture Small group discussion	MCQ		
HomUG-ObGy-1 1.3	H O	KH	Hahnemannian classification of disease.	Classify diseases according to Hahnemann	C1	MK	Lecture Small group discussion	MCQ		Organon of Medicine
HomUG-ObGy-1 1.4	H O	KH	Homoeopathic literature	Discuss the Homoeopathic case taking in female complaints as per Organon of Medicine	C I	MK	Lecture/ Integrated Small Group discussion CBL	MCQ/		Organon of Medicine

HomUG-ObGy-1 1.5	H O	KH		Discuss Hahnemann's concept of case taking in females according to different Homoeopathic authors	C1	MK	Lecture/ Small group discussion CBL PBL	MCQ/		Organon of Medicine
HomUG-ObGy-1 1.6	H O	KH	Materia Medica& Therapeutics Materia	Discuss the list of indicated medicines for the gynaecological conditions	C2	MK	Lecture / small group discussion PBL CBL	MCQ	SAQ	Materia Medica,
HomUG-ObGy-1 1.7	H O	KH		Discuss the characteristic indication of medicines mention in the list	C2	MK	Lecture / small group discussion PBL CBL	MCQ	SAQ	Materia Medica,
HomUG-ObGy-1 1.8	H O	KH		Discuss the differentiation of the remedies	C2	MK	Lecture / small group discussion PBL CBL	MCQ	SAQ	Materia Medica, Pathology
HomUG-ObGy-1 1.9	H O	KH		Discuss the remedy relationship wherever applicable	C2	MK	Lecture / small group discussion PBL CBL	MCQ		Materia Medica, Pathology
HomUG-ObGy-1 1.10	H O	KH	Repertory	Describe the selection of repertories in different gynaecological conditions	C2	MK	Lecture / small group discussion PBL CBL	MCQ		Repertory

HomUG-ObGy-1 1.11	H O	KH		Explain how to convert symptoms into rubrics from different repertories in gynaecological conditions	C2	MK	Lecture / small group discussion PBL CBL	MCQ		Repertory
HomUG-ObGy-1 1.12	H O	KH		Explain the selection of rubrics from different gynaecological conditions.	C2	MK	Lecture / small group discussion PBL CBL	MCQ		Repertory

**6.2.1. Review of the applied anatomy of the female reproductive system.: Development of genital tract, malformations and their clinical significance**

Sl. No.	Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-I-2.1	K & S	K	External genitalia organs	Name the external genitalia organs	C I	MK	Small group discussion Models	MCQ		
HomUG-ObGy-I-2.2	K & S	K	Internal genitalia organs	Name the internal genitalia organs.	C I	MK	Small group discussion Charts	MCQ		
HomUG-ObGy-I-2.3	K & S	KH	Internal genitalia organs	Draw and label the anatomy of the uterus	P2	MK	Small group discussion Charts	MCQ		

<b>HomUG-ObGy-I-2.4</b>	K & S	K	Internal genitalia organs	Name the blood supply of the uterus	C I	MK	Small group discussion Charts	MCQ		
<b>Hom-UG ObGy-I-2.5</b>	K & S	KH	Internal genitalia organs	Draw & Label the normal anatomy of the fallopian tubes.	P2	MK	Small group discussion Chars	MCQ	SAQ	
<b>HomUG-ObGy-I-2.6</b>	K & S	KH	Gonads	Draw & Label the normal anatomy of the ovarian structures	P2	MK	Small group discussion Charts	MCQ	SAQ	
<b>HomUG-ObGy-I-2.7</b>	K & S	K	Pelvic fascia, cellular tissues & ligaments	Name the pelvic floor muscles, ligaments and fascia.	C I	MK	Small group discussion Charts	MCQ	SAQ	
<b>HomUG-ObGy-I-2.8</b>	K & S	K	Malformation of the vagina	Discuss the vaginal abnormalities	CI	MK	Small group discussion Charts	MCQ		
<b>HomUG-ObGy-I-2.9</b>	K & S	K		Describe the clinical features of vaginal abnormalities	CI	MK	Small group discussion CBL CBL	MCQ		
<b>HomUG-ObGy-I-2.10</b>	K & S	K	Malformation of the vagina	List the vaginal mal-developments	CI	MK	Small group discussion	MCQ		
<b>Hom-UG-ObGy-I-2.11</b>	K & S	K		Discuss the aetiological factors for vaginal mal-development	CI	MK	Lecture Small group discussion Tutorials	MCQ		



<b>HomUG-ObGy-I-2.12</b>	K & S	KH	Malformation of the uterus	Describe the various malformations of the uterus.	CI	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-I-2.13</b>	K & S	K		Discuss the clinical features of uterine anomalies	CI	MK	Small group discussion CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-2.14</b>	K & S	K	Malformation of the ovaries	List the anomalies of the ovaries	C2	MK	Lecture Small group discussion	MCQ		
<b>HomUG-ObGy-I-2.15</b>	K & S	K	Malformation of the fallopian tubes	List the anomalies of the fallopian tubes	C2	MK	Lecture Small group discussion	MCQ		

**6.3. A review of the applied physiology of female reproductive system - Puberty, Menstruation and its disorders including, amenorrhea, dysmenorrhea, menorrhagia, metrorrhagia, epimenorrhoea, AUB, Postmenopausal bleeding and menopause with related ailments and its scope and management in Homoeopathy and integrate wherever necessary with other disciplines.**

Sl. No.	Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-I-3.1	K & S	K	Endocrinology in puberty	List the hormones of Hypothalamus.	C1	MK	Lecture Small group discussion	MCQ		Physiology
HomUG-ObGy-I-3.2	K & S	K		List the functions of hormones of Hypothalamus	C1	MK	Lecture Small group discussion Tutorials	MCQ		Physiology
HomUG-ObGy-I-3.3	K & S	K	Endocrinology in puberty	Name the hormones of Anterior Pituitary.	C1	MK	Lecture Small group discussion Tutorials	MCQ		Physiology
HomUG-ObGy-I-3.4	K & S	K		List the functions of Anterior Pituitary hormones	C1	MK	Lecture Small group discussion Tutorials	MCQ		Physiology
HomUG-ObGy-I-3.5	K & S	K		Name the hormones of Posterior Pituitary	C1	MK	Lecture Small group discussion Tutorials	MCQ		Physiology

<b>HomUG</b> -ObGy-I- 3.6	K & S	K		List the functions of Posterior Pituitary hormones	C1	MK	Lecture Small group discussion Tutorials	MCQ		Physiology
<b>HomUG</b> -ObGy-I- 3.7	K & S	K	Endocrinology in puberty	Name the hormones of Ovary	C1	MK	Lecture Small group discussion.	MCQ		Physiology
<b>HomUG</b> -ObGy-I- 3.8	K & S	K	Endocrinology in puberty	List the functions of ovarian hormones.	C1	MK	Lecture Small group discussion	MCQ	SAQ	Physiology
<b>HomUG</b> -ObGy-I- 3.9	K & S	K		Discuss the Importance of HPO axis during Foetal life, Puberty & at Menopause	C1	MK	Lecture Small group discussion	MCQ	SAQ	Physiology
<b>HomUG</b> -ObGy-I- 3.10	K & S	K	Physiology of Menstruation	Define Menstruation	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	Physiology
<b>HomUG -</b> ObGy-I- 3.11	K & S	K		What are the Phases of Menstruation	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	Physiology
<b>HomUG-</b> ObGy- 13.12	K & S	K	Hormonal changes during each phase of menstruation	Discuss the Hormonal Changes during each Phase of Menstruation	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	Physiology
<b>HomUG-</b> ObGy-I 3.13	K & S	K	Uterine changes during each phase of menstruation	Describe the Ovarian Changes during each phase of Menstruation	C1	MK	Lecture Small group discussion		SAQ	Physiology

<b>HomUG-ObGy-I-3.14</b>	K & S	K		Describe the Uterine Changes occurs during each phase of Menstruation	C1	MK	Lecture Small group discussion Tutorials		SAQ	Physiology
<b>HomUG-ObGy-I-3.15</b>	K & S	K	Puberty	Define puberty	C1	MK	Lecture Small group discussion	MCQ		
<b>HomUG-ObGy-I-3.16</b>	K & S	K	Precocious puberty	Describe the Pubertal changes as per Tanner's Classification	C1	MK	Lecture Small group discussion Tutorials		SAQ	
<b>HomUG-ObGy-I-3.17</b>	K & S	K		Define Precocious puberty	C1	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-I-3.18</b>	K & S	K		Discuss the causes of Precocious puberty	C1	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-I-3.19</b>	K & S	K		Find the diagnostic features of Precocious puberty	C1	MK	Lecture Small group discussion CBL CBL	MCQ		
<b>Hom-UG ObGy-I-3.20</b>	K & S	K	Delayed puberty	Define Delayed puberty	C1	MK	Lecture Small group discussion	MCQ		

<b>HomUG-ObGy-I-3.21</b>	K & S	K		Discuss the causes for Delayed puberty	C1	MK	Lecture Small group discussion		SAQ	
<b>HomUG-ObGy-I-3.22</b>	K & S	K		Discuss the characteristic features of delayed puberty	C1	MK	Lecture Small group discussion Tutorials		SAQ	
<b>HomUG-ObGy-I-3.23</b>	K & S	K	Menorrhagia	Define puberty menorrhagia	C1	MK	Lecture Small group discussion	MCQ		
<b>Hom-UG-ObGy-I-3.24</b>	K & S	K		Discuss the causes of Puberty menorrhagia	C1	MK	Lecture Small group discussion		SAQ	
<b>HomUG-ObGy-I-3.25</b>	K & S	K		Discuss the Diagnostic features of Puberty menorrhagia	C1	MK	Lecture Small group discussion CBL PBL	MCQ		
<b>HomUG-ObGy-I-3.26</b>	H O	K	Materia medica Therapeutics	Discuss the Homoeopathic remedies for delayed puberty	C1	MK	Lecture Small group discussion CBL PBL		SAQ	<b>Materia medica</b>
<b>HomUG-ObGy-I-3.27</b>	H O	K		Discuss the Homoeopathic remedies for puberty menorrhagia	C1	MK	Lecture Small group discussion CBL PBL		SAQ	<b>Materia medica</b>

<b>HomUG</b> -ObGy-I- 3.28	H O	K		Discuss the characteristic features of the indicated remedies	C1	MK	Lecture Small group discussion CBL PBL		SAQ	<b>Materia medica</b>
<b>HomUG</b> -ObGy-I- 3.29	H O	K	Management	Explain the management for Anomalies of Gonadal Function	C1	MK	Lecture Small group discussion CBL CBL	MCQ		<b>Organon of medicine</b>
<b>HomUG</b> -ObGy-I- 3.26	K & S	K	Amenorrhoea	Define Amenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ	SAQ	
<b>HomUG</b> -ObGy-I- 3.30	K & S	KH		Classify Amenorrhoea	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG</b> -ObGy-I- 3.31	K & S	K		Define Primary Amenorrhoea	C1	MK	Lecture Small group discussion CBL PBL	MCQ	SAQ	
<b>HomUG</b> -ObGy-I- 3.32	K & S	K	Primary amenorrhoea	Describe the causes of Primary amenorrhoea	C2	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	
<b>HomUG</b> -ObGy-I- 3.33	K & S	K	Secondary amenorrhoea	Define Secondary amenorrhoea	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	

<b>HomUG-ObGy-I-3.34</b>	K & S	K		Describe the causes of Secondary amenorrhoea	CI	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-I-3.35</b>	K & S	K	Cryptomenorrhoea	Define Cryptomenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.36</b>	K & S	K		Discuss the causes of Cryptomenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.37</b>	K & S	Shows	Examinations	Demonstrate the general physical, systemic and per vaginal examination in Primary amenorrhoea	P3	MK	Clinical examinations CBL PBL			
<b>HomUG-ObGy-I-3.38</b>	K & S	KH	Investigations	Explain the clinical, laboratory and radiological investigations done in Primary amenorrhoea	C2	MK	Lecture Small group discussion CBL			
<b>HomUG-ObGy-I-3.39</b>	K & S	KH		Discuss clinical, laboratory and radiological investigations done in secondary amenorrhoea	C2	MK	Lecture Small group discussion CBL CBL	MCQ		

<b>HomUG-ObGy-I-3.40</b>	H O	KH	Management	Discuss the general management for Primary amenorrhoea	C2	MK	Lecture Small group discussion CBL	MCQ/		
<b>HomUG-ObGy-I-3.41</b>	H O	KH	Homoeopathic Materia medica & therapeutics	Discuss the Homoeopathic remedies for Primary amenorrhoea	C2	MK	Small group discussion PBL CBL	MCQ		<b>Materia medica</b>
<b>HomUG-ObGy-I-3.42</b>	H O	KH		Discuss the Homeopathic remedies for Secondary Amenorrhoea	C2	MK	Lecture Small group discussion CBL Tutorials	MCQ		<b>Materia Medica</b>
<b>HomUG-ObGy-I-3.43</b>	H O	K		Discuss the characteristic features of the indicated remedies	C2	MK	Lecture Small group discussion PBL CBL	MCQ		<b>Materia Medica</b>
<b>HomUG-ObGy-I-3.44</b>	K & S	K	Hypomenorrhoea	Define Hypomenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ		
<b>HomUG-ObGy-I-3.45</b>	K & S	K		Discuss the Causes of Hypomenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.46</b>	K & S	K	Oligomenorrhoea	Define Oligomenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ	SAQ	



<b>HomUG-ObGy-I-3.47</b>	K & S	K	Polymenorrhoea	Discuss the causes of Oligomenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.48</b>	K & S	K		Define Polymenorrhoea	C1	MK	Lecture Small group discussion CBL	MCQ		
<b>HomUG-ObGy-I-3.49</b>	K & S	K		Discuss the causes of Polymenorrhoea	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.50</b>	K & S	K	Metrorrhagia	Define Metrorrhagia	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ		
<b>HomUG-ObGy-I-3.51</b>	K & S	KH		Discuss the causes of Metrorrhagia	C1	MK	Lecture Small group discussion Tutorials CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.52</b>	K & S	K	Menorrhagia	Define menorrhagia	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ		
<b>HomUG-ObGy-I-3.53</b>	K & S	K		Discuss the causes of menorrhagia	C1	MK	Lecture Small group discussion Tutorials CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.54</b>	K & S	K	AUB	Define Abnormal Uterine Bleeding	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ		

<b>HomUG-ObGy-I-3.55</b>	K & S	KH		Classify Abnormal Uterine Bleeding	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.56</b>	K & S	KH		Discuss the causes of AUB	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.57</b>	K & S	KH	Investigations for AUB	Discuss the important investigation to be done in AUB	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.58</b>	K & S	KH	Management of AUB	Explain the general Management of AUB	C2	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.59</b>	K & S	K	Metropathia haemorrhagica	Define Metropathia haemorrhagica	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ		
<b>HomUG-ObGy-I-3.60</b>	K & S	KH		Discuss the causes of metropathia hemorrhagica	C1	MK	Lecture Small group discussion CBL Tutorials		SAQ	
<b>HomUG-ObGy-I-3.61</b>	H O	KH	Homoeopathic materia medica & therapeutics	Discuss the homoeopathic remedies for AUB	C1	MK	Lecture Small group discussion CBL Tutorials		SAQ	Materia Medica

<b>HomUG-ObGy-I-3.62</b>	H O	KH		Discuss the characteristic features of the indicated remedies	C1	MK	Lecture Small group discussion Tutorials CBL PBL		SAQ	Materia Medica
<b>HomUG-ObGy-I-3.63</b>	K & S	K	Dysmenorrhoea	Define dysmenorrhoea	C1	MK	Lecture Small group discussion Tutorials CBL PBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.64</b>	K & S	KH		Classify dysmenorrhoea	C1	MK	Lecture Small group discussion Tutorials	SAQ/MCQ	SAQ	
<b>HomUG-ObGy-I-3.65</b>	K & S	KH		Discuss the causes of Primary Dysmenorrhoea	C1	MK	Lecture Small group discussion Tutorials	SAQ/MCQ	SAQ	
<b>HomUG-ObGy-I-3.66</b>	K & S	KH		Discuss the causes of Secondary dysmenorrhoea	C I		Lecture Small group discussion CBL Tutorials		SAQ	
<b>HomUG-ObGy-I-3.67</b>	K & S	KH		Discuss the clinical features Primary Dysmenorrhoea	C1	MK	Lecture Small group discussion Tutorials CBL PBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.68</b>	K & S	KH	Dysmenorrhoea	Discuss the clinical features Secondary Dysmenorrhoea	C1	MK	Lecture Small group discussion Tutorials CBL PBL	MCQ	SAQ	

<b>HomUG-ObGy-I-3.69</b>	K & S	KH		Differentiate Primary and Secondary Dysmenorrhoea	C1	MK	Small group discussion Tutorials CBL PBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.70</b>	K & S	K		Define Mittelschmerz's syndrome	C1	MK	Lecture Small group discussion CBL PBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.71</b>	K & S	KH		Discuss the causes for Mittelschmerz's syndrome	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.72</b>	K & S	KH		Discuss the general Management of Dysmenorrhoea	C2	MK	Small group discussion Tutorials CBL PBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.73</b>	H O	KH	Homoeopathic materia medica & therapeutics	Discuss the homoeopathic remedies in Spasmodic dysmenorrhoea	C2	MK	Small group discussion Tutorials CBL PBL	MCQ	SAQ	Materia Medica
<b>HomUG-ObGy-I-3.74</b>	H O	KH		Discuss the homoeopathic remedies in Congestive dysmenorrhoea	C2	MK	Small group discussion Tutorials PBL CBL	MCQ	SAQ	Materia Medica

<b>HomUG-ObGy-I-3.75</b>	H O	KH		Discuss the homoeopathic remedies in Membranous dysmenorrhoea	C2	MK	Small group discussion Tutorials CBL CBL	MCQ	SAQ	Materia Medica
<b>HomU-G ObGy-I-3.76</b>	H O	KH		Discuss the characteristic features of indicated remedies in dysmenorrhoea	C2	MK	Lecture Small group discussion Tutorials CBL PBL	MCQ	SAQ	Materia Medica
<b>HomUG-ObGy-I-3.77</b>	K & S	K	PMS	Define Premenstrual Syndrome	C1	MK	Lecture Small group discussion Tutorials CBL PBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.78</b>	K & S	KH		Discuss the causes for premenstrual syndrome	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.79</b>	K & S	K		Discuss the clinical features of premenstrual syndrome	C1	MK	Lecture Small group discussion CBL PBL Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.80</b>	K & S	KH		Discuss the general management of premenstrual Syndrome	C1	MK	Lecture Small group discussion Tutorials CBL	MCQ	SAQ	

<b>HomUG-ObGy-I-3.81</b>	H O	KH	Homoeopathic materia medica & therapeutics	Explain the Homoeopathic remedies in Premenstrual complaints	C1	MK	Small group discussion Tutorials CBL PBL	MCQ	SAQ	Materia Medica
<b>HomUG-ObGy-I-3.82</b>	H O	KH		Discuss the characteristic features of indicated remedies in Premenstrual complaints	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	Materia Medica
<b>HomUG-ObGy-I-3.83</b>	K & S	K	Menopause	Define Menopause	C1	MK	Lecture Small group discussion Tutorials	MCQ		
<b>HomUG-ObGy-I-3.84</b>	K & S	K		Discuss the Pathophysiology of Menopause	C1	MK	Lecture Small group discussion CBL Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-I-3.85</b>	K & S	K		Discuss the Anatomical Changes taking place during menopause	C1	MK	Lecture Small 0	MCQ	SAQ	
<b>HomUG-ObGy-I-3.86</b>	K & S	K		Discuss the clinical features of menopause	C1	MK	Lecture Small group discussion PBL CBL	SAQ/MCQ		
<b>HomUG-ObGy-I-3.87</b>	K & S	K		Define Menopausal syndrome	C1	MK	Lecture small group discussion PBL CBL	MCQ	SAQ	

<b>HomUG-ObGy-I-3.88</b>	K & S	K		Discuss the anatomical and metabolic changes taking place during menopause	C1	MK	Lecture small group discussion PBL CBL	MCQ	SAQ	C1
<b>HomUG-ObGy-I-3.89</b>	K & S	K	Perimenopause	Define Perimenopause	C1	MK	Lecture small group discussion PBL CBL	MCQ	SAQ	C1
<b>HomUG-ObGy-I-3.90</b>	K & S	K	Artificial menopause	Define Artificial menopause	C1	MK	Lecture small group discussion PBL CBL	MCQ	SAQ	C1
<b>HomUG-ObGy-I-3.91</b>	K & S	K	Premature menopause	Define Premature Menopause	C1	MK	Lecture/ Small group discussion	MCQ		
<b>HomUG-ObGy-I-3.92</b>	K & S	K		Discuss aetiology of Premature Menopause	C1	MK	Lecture/ Small group discussion		SAQ	
<b>HomUG-ObGy-I-3.93</b>	K & S	K	Delayed menopause	Define delayed menopause	C1	MK	Lecture Small group discussion	MCQ		
<b>HomUG-ObGy-I-3.94</b>	K & S	K		Discuss causes of delayed menopause	C1	MK	Lecture Small group discussion		SAQ	
<b>HomUG-ObGy-I-3.95</b>	K & S	KH	Management	Discuss the general management of Menopause	C1	MK	Lecture small group discussion PBL CBL		SAQ	

<b>HomUG-ObGy-I-3.96</b>	K & S	KH	Homoeopathic Materia medica & therapeutics	List the Homoeopathic remedies for Menopause.	C2	MK	Ssmall group discussion PBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.97</b>	K & S	KH		Discuss the characteristic features of the indicated remedies.	C2	MK	Lecture small group discussion PBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.98</b>	K & S	K	Postmenopausal bleeding Investigations	Define Postmenopausal bleeding	C1	MK	Lecture/ small group discussion PBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.99</b>	K & S	KH		Discuss the causes for Postmenopausal bleeding	C1	MK	Lecture small group discussion PBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.100</b>	K & S	KH		Discuss the important investigations required for postmenopausal bleeding	C2	MK	Lecture/ small group discussion PBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.101</b>	K & S	KH	Investigations	Discuss what are the investigation required in case of post-menopausal bleeding	C2	MK	Lecture/ small group discussion PBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.102</b>	K & S	KH	Differential diagnosis	Discuss the differential diagnosis for postmenopausal bleeding	C1	MK	Lecture / small group discussion PBL CBL	MCQ	SAQ	



<b>HomUG-ObGy-I-3.103</b>	K & S	KH	Materia Medica & therapeutics	Discuss the homoeopathic remedies for postmenopausal bleeding	C2	MK	Lecture / small group discussion PBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-I-3.104</b>	K & S	KH		Discuss the characteristic features of the indicated remedies.	C2	MK	Lecture/ small group discussion PBL CBL	MCQ	SAQ	

#### 6.4 Gynaecological case taking, Physical examination, investigation and approach to clinical diagnosis and differential diagnosis

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 4.1	H O	K	Case taking	Discuss the format of history taking in gynaecological conditions.	C 2	MK	Small group discussion CBL			
HomUG-ObGy-1 4.2	H O	Shows		Explain the importance of communication skills while case taking.	P2	MK	Small group discussion CBL			
HomUG-ObGy-1 4.3	H O	KH		Explain the importance of clinical skills in case taking	C I	MK	Small group discussion CBL Clinical examination	VIVA		
HomUG-ObGy-1 4.4	H O	KH		Discuss the Homoeopathic case	C 2	MK	Small group discussion	VIVA		

				taking in female complaints as per Organon of Medicine			Case based learning CBL			
<b>HomUG-ObGy-1</b> 4.5	P C	Does	Physical examination	Demonstrate the general physical examination	P 2	MK	Small group discussion Clinical demonstration	MCQ		
<b>HomUG-ObGy-1</b> 4.6	P C	Does	Abdominal examination	Describe how to perform per abdominal examination.	P 2	MK	Small group discussion Tutorials CBL Bedside	MCQ		
<b>Hom-UG ObGy-1</b> 4.7	P C	Does	Vaginal examination	Describe how to perform per vaginal speculum examination.	P 2	MK	Small group discussion Tutorials CBL Bedside	MCQ		
<b>HomUG-ObGy-1</b> 4.8	K & S	KH	Investigations	Discuss the investigations required in dysmenorrhea	C 2	MK	Small group discussion Tutorials CBL PBL	MCQ		
<b>HomUG-ObGy-1</b> 4.9	K & S	KH		Discuss the investigation required in Amenorrhoea	C 2	MK	Small group discussion Tutorials CBL PBL	MCQ		
<b>HomUG-ObGy-1</b>	K & S	KH		Discuss the investigations	C 2	MK	Small group discussion	MCQ		

4.10				required in AUB case.			Tutorials CBL PBL			
<b>HomUG</b> ObGy-1 4.11	K & S	KH		Discuss the investigation required in malformations of the FGT	C 2	MK	Small group discussion CBL PBL	MCQ		
<b>Hom-UG-</b> ObGy-1 4.12	K & S	KH	Clinical diagnosis	Derive the clinical diagnosis from the signs & symptoms	C 2	MK	Small group discussion CBL PBL	MCQ		
<b>HomUG-</b> ObGy-1 4.13	K & S	KH	Pathological diagnosis	Derive the pathological diagnosis with a help of laboratory and radiological findings.	C 2	MK	Small group discussion CBL PBL	MCQ		
<b>HomUG-</b> ObGy-1 4.14	K & S	KH	Differential diagnosis	Discuss the differential diagnosis with relation to patient history & Signs & Symptoms,	C 2	MK	Small group discussion CBL PBL	MCQ		

### 6.5 Epidemiology – Predisposition including fundamental miasm; personality type known to develop particular disease

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
<b>HomUG-ObGy-1</b> 5.1	H O	K	Predisposition	Define predisposition	C1	MK	Lecture Small group discussion Tutorials	MCQ		Organon of medicine
<b>HomUG-ObGy-1</b> 5.2	H O	K		Discuss the relevance of predisposing factors for the disease.	C1	MK	Lecture Small group discussion Tutorials	MCQ		Organon of medicine
<b>HomUG-ObGy-1</b> 5.3	H O	K	Miasm	Define miasm	C1	MK	Lecture Small group discussion Tutorials	MCQ		Organon of medicine
<b>HomUG-ObGy-1</b> 5.4	H O	K		Discuss the types of miasms	C1	MK	Lecture Small group discussion Tutorials	MCQ		Organon of medicine
<b>HomUG-ObGy-1</b> 5.5	H O	K		Discuss the relevance of miasm for the disease conditions	C1	MK	Lecture Small group discussion	MCQ		Organon of medicine

							Tutorials			
<b>HomUG-ObGy-1</b> 5.6	H O	K	Fundamental miasm	Define fundamental miasm	C1	MK	Lecture Small group discussion Tutorials	MCQ		Organon of medicine
<b>HomUG-ObGy-1</b> 5.7	H O	K		Discuss the relevance of fundamental miasm for the disease	C1	MK	Lecture Small group discussion Tutorials	MCQ		Organon of medicine
<b>HomUG-ObGy-1</b> 5.8	H O	K	Personality type	Discuss the importance of personality of the patient for developing Disease condition.	C1	MK	Lecture Small group discussion Tutorials	MCQ		Organon of medicine

**6.6 Uterine displacements- Prolapse, retroversion and inversion with its exciting and maintaining causes, disease manifestations, prognosis, management and scope in homoeopathic perspective.**

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
<b>HomUG-ObGy-1</b> 6.1	K & S	K	Genital Prolapse	Define Genital prolapse	C1	MK	Lecture Small group discussion Charts	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.2	K & S	K		Discuss the aetiology of Genital prolapse	C1	MK	Lecture Small group discussion Tutorials Charts	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.3	K & S	K		Classify genital prolapses	C1	MK	Lecture Small group discussion Tutorials Charts	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.4	K & S	K	Rectocele	Define Rectocele	C1	MK	Lecture Small group discussion Tutorials Charts	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.5	K & S	K	Cystocele	Define cystocele	C1	MK	Lecture Small group discussion	MCQ	SAQ	

<b>HomUG-ObGy-1</b> 6.6	K & S	K		Discuss the degrees of cystocele	C1	MK	Lecture Small group discussion CBL	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.7	K & S	K	Uterine prolapse	Discuss the degrees of uterine prolapse	C1	MK	Lecture Small group discussion CBL PBL	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.8	K & S	K	Genital prolapse	Describe the aetiology of genital prolapse	C1	MK	Lecture Small group discussion Tutorials Charts	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.9	K & S	K		Discuss the Clinical Features of Genital prolapse	C2	MK	Lecture Small g Clinical examination CBL CBL	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.10	K & S	K		Discuss the Differential Diagnosis of Genital prolapse	C2	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.11	K & S	K		Discuss the Prophylaxis of Genital prolapse	C2	MK	Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.12	K & S	K		Discuss the general management for Genital prolapse	C2	DK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b>	K & S	K		Define Procidentia	C2	DK	Lecture	MCQ	SAQ	



6.13							Small group discussion Tutorials			
<b>HomUG-ObGy-1</b> 6.14	K & S	K		Discuss the complications of genital prolapse	C2	DK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.15	K & S	K	Homoeopathic Materia medica & therapeutics	Discuss the Homoeopathic remedies for genital prolapse	C2	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.16	K & S	K	Discuss the	Discuss the Characteristic features of indicated remedies.	C2	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.17	K & S	K	Pessary treatment	Define Pessary treatment	C2	MK	Lecture Small group discussion Tutorials Charts	MCQ		
<b>HomUG-ObGy-1</b> 6.18	K & S	K		Discuss the indications & contraindications of pessary treatment	C2	MK	Lecture Small group discussion Tutorials	MCQ/	SAQ	
<b>HomUG-ObGy-1</b> 6.19	K & S	K	Surgical management	List the surgical management for genital prolapse	C2	DK	Lecture Small group discussion	MCQ		
<b>HomUG-ObGy-1</b> 6.20	K & S	K		Define retroversion of uterus	C1	MK	Lecture Small group discussion	MCQ		

<b>HomUG-ObGy-1</b> 6.21	K & S	K	Retroversion	Discuss the causes of retroverted uterus	C2	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.22	K & S	K		List the types of retroverted uterus	C1	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.23	K & S	K		Discuss the clinical features of retroverted uterus	C1	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.24	K & S	K	Retroversion degrees	Discuss the degrees of retroversion of uterus	CI	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.25	K & S	K	Differential diagnosis	Discuss the Differential Diagnosis of retroverted uterus	C2	MK	Lecture Small group discussion	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.26	K & S	K	Homoeopathic material medica & therapeutics	Discuss the Homoeopathic remedies for retroverted uterus	C2	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.27	K & S	K		Discuss the characteristic features of indicated remedies.	C2	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.28	K & S	K	Inversion	Define inversion of uterus	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.29	K & S	K		Recall the aetiology of inverted uterus	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	

<b>HomUG-ObGy-1</b> 6.30	K & S	K	Scope & Limitation of Homoeopathy	Classify the types of inversion of uterus	C2	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.31	K & S	K		Discuss the Clinical Features of inverted uterus	C1	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.32	K & S	KH		Discuss the scope & limitation of Homoeopathy in inversion of uterus	C2	MK	Lecture Small group discussion Tutorials	MCQ	SAQ	
<b>HomUG-ObGy-1</b> 6.33	K & S	KH	Homoeopathic materia medica & therapeutics	List the Homoeopathic remedies indicated in inversion of uterus	C2	MK	Small group discussion CBL PBL	MCQ	SAQ	

**6.7 Sex & Intersexuality – Knowledge and scope to eradicate genetic Dyscrasias, predisposition, miasm and personality types known to develop particular diseases through Homoeopathic outlook**

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
<b>HomUG-ObGy-1</b> 7.1	K & S	K	Sex & Intersexuality	Define Klinifelters syndrome	C1	DK	Lecture Small group discussion Tutorials Charts	MCQ		
<b>HomUG -ObGy-1</b> 7.2	K & S	K		Define Inter-sex	C2	DK	Lecture Small group discussion Tutorials Charts	MCQ		
<b>HomUG-ObGy-1</b> 7.3	K & S	K	Turner's syndrome	Explain Turner's syndrome	C1	DK	Lecture Small group discussion Tutorials Charts		SAQ	
<b>HomUG-ObGy-1</b> 7.4	K & S	K	Hermaphrodites	Discuss True Hermaphrodites & mention types	C2	DK	Lecture Small group discussion Tutorials Charts		SAQ	
<b>HomUG-ObGy-1</b>	K & S	K	Male intersex	Discuss the male Inter-sex	C2	DK	Lecture	VIVA		

7.5							Small group discussion Tutorials Charts			
<b>HomUG-ObGy-1</b> 7.6	H O	K	Personality Type	Discuss the relevance of Predisposition with respect to Intersexuality	C2	MK	Small group discussion Tutorials Charts	VIVA		Organon of medicine
<b>HomUG-ObGy-1</b> 7.7	H O	K	H O	Discuss the relevance of miasm with respect to intersexuality.	C2	MK	Lecture Small group discussion Tutorials	VIVA		Organon of medicine
<b>HomUG-ObGy-1</b> 7.8	H O	K	H O	Discuss the relevance of predisposition with respect to intersexuality	C2	MK	Lecture Small group discussion Tutorials	VIVA		Organon of medicine
<b>HomUG-ObGy-1</b> 7.9	H O	K	H O	Discuss the importance of personality of the patient for developing Disease condition	C2	MK	Lecture Small group discussion Tutorials	VIVA		Organon of medicine
<b>HomUG-ObGy-1</b> 7.10	H O	K	Homoeopathic materia medica & therapeutics	Discuss the homoeopathic matria medica therapeutics for Intersexuality	C2	DK	Lecture Small group discussion Tutorials	MCQ		Materia Medica

**6.8 General & Homeopathic Management, Repertorisation, Therapeutics, Posology, Formulation of prognostic criteria and prognosis of related topics in Gynaecology**

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
<b>HomUG-ObGy-1</b> 8.1	H O	KH	Management	Explain the general management in Dysmenorrhoea	C 2	MK	Lecture Small group discussion Tutorials CBL	Viva	SAQ	
<b>HomUG-ObGy-1</b> 8.2	H O	KH		Explain the general management in Amenorrhoea	C 2	MK	Lecture Small group discussion Tutorials CBL	Viva	SAQ	
<b>HomUG-ObGy-1</b> 8.3	H O	KH		Explain the general management in Genital prolapse	C 2	MK	Lecture Small group discussion Tutorials CBL	VIVA	SAQ	
<b>HomUG-ObGy-1</b> 8.4	H O	KH		Explain the general management in retroversion of the uterus	C 2	MK	Lecture Small group discussion Tutorials CBL	VIVA	SAQ	

<b>HomUG-ObGy-1</b> 8.5	H O	K	Repertory	Discuss the repertory medium used in different gynaecological conditions	C 2	MK	Lecture Small group discussion Tutorials CBL	VIVA		
<b>HomUG-ObGy-1</b> 8.6	H O	KH		Discuss the selection of repertory based on symptoms	C 2	MK	Lecture Small group discussion Tutorials CBL	VIVA		
<b>HomUG-ObGy-1</b> 8.7	H O	K	Homoeopathic Materia medica & therapeutics and posology	Co-relate the homoeopathic remedies, potency selection and repetition of dose in relation to gynaecological conditions	C 2	MK	Lecture Small group discussion Tutorials CBL	VIVA		

## Unit 2: Obstetrics, Infant Care & Homoeopathic Therapeutics

### 6.9 Introduction to Obstetrics and Newborn care related with Homoeopathic Philosophy. Therapeutics and Repertorisation

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 9.1	K & S	K	Introduction to Obstetrics	Define Obstetrics	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 9.2	K & S	K	Introduction to newborn care	Define the term New born Infant	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 9.3	K & S	K	Introduction to newborn care	Define Still birth	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 9.4	H O	K	Homoeopathic case taking	Explain the Homoeopathic case taking in female complaints as per Organon of Medicine.	P1	MK	Lecture Tutorials Small group discussion	VIVA		Organon of medicine
HomUG-ObGy-1 9.5	H O	K		Describe the Hahnemann's concept of action of homoeopathic medicines in pregnant women & infants. Foot note aphorism 284	C2	MK	Lecture Small group discussion Tutorials	VIVA		Organon of medicine



HomUG-ObGy-1 9.6	H O	KH	Homoeopathic Materia Medica & Therapeutic source books	Discuss the Homoeopathic Materia Medica with Obstetrics and new born care from source books	C2	MK	Lecture Small group discussion Tutorials	VIVA		Organon of medicine
HomUG-ObGy-1 9.7	H O	K	Repertory	Discuss the repertory medium used in different obstetrical and new born care.	C2	MK	Lecture Small group discussion Tutorials	VIVA		Repertory
HomUG-ObGy-1 9.8	H O	K	Repertory	Discuss the selection of repertory based on symptoms in obstetrics.	C2	MK	Lecture Small group discussion Tutorials CBL	MCQ		Repertory
HomUG-ObGy-1 9.9	H O	K	Repertory	Discuss the selection of repertory based on symptoms in new born care.	C2	MK	Lecture Small group discussion Tutorials CBL	MCQ		Repertory

### 6.10 Fundamentals of reproduction

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 10.1	K & S	K	Gametogenesis	Define oogenesis	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.2	K & S	KH		Discuss the stages of oogenesis	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 10.3	K & S	KH		Define Spermatogenesis	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.4	K & S	KH		Discuss the stages of spermatogenesis	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 10.5	K & S	KH	Ovulation	Define ovulation	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.6	K & S	K		Describe the mechanism of ovulation	C1	MK	Lecture Tutorials		SAQ	Physiology, Anatomy

							Small group discussion			
HomUG-ObGy-1 10.7	K & S	K		Describe the hormonal regulation of ovulation	C1	MK	Lecture Tutorials Small group discussion		SAQ	Physiology, Anatomy
HomUG-ObGy-1 10.8	K & S	K	Fertilization	Define Fertilization	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.9	K & S	K		Describe Morula	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.10	K & S	K		Describe Blastocyst	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.11	K & S	K	Implantation	Define Implantation	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.12	K & S	K		Discuss the Stages of Implantation	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.13	K & S	K		Discuss the functions of Trophoblast	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1	K & S	K	Decidua	Define Decidua	C1	MK	Lecture Tutorials	MCQ		Physiology, Anatomy

10.14							Small group discussion			
HomUG-ObGy-1 10.15	K & S	K		Define Decidual Reaction	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 10.16	K & S	K		Describe the layers of Decidua	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 10.17	K & S	K		Describe the Functions of Decidua	C1	MK	Lecture Tutorials Small group discussion		SAQ	Physiology, Anatomy
HomUG-ObGy-1 10.18	K & S	K	Chorion & Chorionic Villi	Define Chorion	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
Hom-UG ObGy-1 2.28	K & S	K		Describe the Chorionic Villi	C1	MK	Lecture Tutorials Small group discussion		SAQ	Physiology, Anatomy
HomUG-ObGy-1 10.19	K & S	K	Inner Cell Mass	Describe the development of Inner Cell Mass	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy

### 6.10.1 Development of Intra Uterine Pregnancy- Placenta and foetus.

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 11.1	K & S	K	Placenta	Define Placenta	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 11.2	K & S	K		Discuss the development of Placenta	C1	DK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 11.3	K & S	K		Describe the Placenta at Term	C1	DK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 11.4	K & S	K		Describe the Structure of Placenta	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 11.5	K & S	K		Describe the Placental Circulation	C1	MK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 11.6	K & S	K		Discuss the changes with Placental Ageing	C1	DK	Lecture Tutorials	MCQ		Physiology, Anatomy

							Small group discussion			
HomUG-ObGy-1 11.7	K & S	K		List the Functions of Placenta	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 11.8	K & S	K		List the Hormones of Placenta	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 11.9	K & S	K		List Functions of the hormones of Placenta	C1	DK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 11.10	K & S	K	Foetal Membranes	Describe the Structure of Chorion	C1	DK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 11.11	K & S	K		Describe Structure of Amnion	C1	DK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 11.12	K & S	K		List the Functions of Foetal Membranes	C1	DK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1 11.13	K & S	K	Amniotic Cavity, Amniotic Fluid	Discuss the development of Amniotic Cavity	C1	DK	Lecture Tutorials Small group discussion	MCQ		Physiology, Anatomy
HomUG-ObGy-1	K & S	K		Discuss the Circulation of Amniotic Fluid	C1	DK	Lecture Tutorials	MCQ		Physiology, Anatomy

11.14							Small group discussion			
HomUG-ObGy-1 11.15	K & S	K		Discuss the Physical Features of Amniotic Fluid	C1	DK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 11.16	K & S	K		Discuss the Composition of Amniotic Fluid	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 11.17	K & S	K		Discuss the Functions of Amniotic Fluid	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	Physiology, Anatomy
HomUG-ObGy-1 11.18	K & S	K	Umbilical Cord	Discuss the development of Umbilical Cord	C1	DK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 11.19	K & S	K		Discuss the Structure of Umbilical Cord	C1	MK	Lecture Tutorials Small group discussion Charts	MCQ		
HomUG-ObGy-1 11.20	K & S	K		Discuss the Characteristics of Umbilical Cord	C1	DK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 11.21	K & S	K	The Foetus	List the periods of Prenatal Development of Foetus	C1	DK	Lecture Tutorials Small group discussion	MCQ		

HomUG-ObGy-1 11.22	K & S	K		Discuss the Criteria for assessment of Growth of Foetus	C1	NK	Lecture Tutorials Small group discussion Charts	MCQ		
HomUG-ObGy-1 11.23	K & S	K		Discuss the Systemic & Physiological changes occurs during intra uterine life.	C1	DK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 11.24	K & S	K		Discuss the Foetal Circulation	C1	MK	Lecture Tutorials Small group discussion Charts	MCQ	SAQ	
HomUG-ObGy-1 11.25	K & S	K		Discuss the changes in Foetal Circulation at birth.	C1	MK	Lecture Tutorials Small group discussion Charts	MCQ	SAQ	
HomUG-ObGy-1 11.26	K & S	K	Foetus in Utero	Define Lie	C1	MK	Lecture Tutorials Small group discussion Clinical	MCQ VIVA		
HomUG-ObGy-1 11.27	K & S	K		Define Presentation	C1	MK	Lecture Tutorials Small group discussion Manikin	MCQ VIVA		
HomUG-ObGy-1 11.28	K & S	K		Define Presenting part	C1	MK	Lecture Tutorials	MCQ VIVA		



							Small group discussion Manikin			
HomUG-ObGy-1 11.29	K & S	K		Define Attitude	C I P 2	MK	Lecture Tutorials Small group discussion Manikin	MCQ VIVA		
HomUG-ObGy-1 11.30	K & S	K		Define Denominator	C1 P 2	MK	Lecture Tutorials Small group discussion Manikin	MCQ VIVA		
HomUG-ObGy-1 11.31	K & S	K		Define Position	Ci P2	MK	Lecture Tutorials Small group discussion Manikin	MCQ VIVA		
HomUG-ObGy-1 11.32	K & S	K	Foetal Skull and Maternal Pelvis	Demonstrate the Areas of Foetal Skull	CI P2	MK	Lecture Tutorials Small group discussion Charts	MCQ VIVA		
HomUG-ObGy-1 11.33	K & S	K		Demonstrate the Sutures of Foetal Skull	C1 P2	MK	Lecture Tutorials Small group discussion Demonstration	MCQ VIVA		
HomUG-ObGy-1 11.34	K & S	K		Demonstrate the Fontanel of Foetal Skull	C1 P2	MK	Lecture Tutorials Small group discussion	MCQ		

						Demonstration			
HomUG-ObGy-1 11.35	K & S	K		Demonstrate the Diameters of Foetal Skull	C1 P2	MK	Lecture Tutorials Small group discussion Demonstration	MCQ	SAQ
HomUG-ObGy-1 11.36	K & S	K		Define Moulding	C1	MK	Lecture Tutorials Small group discussion	MCQ VIVA	
HomUG-ObGy-1 11.37	K & S	K		Describe Mechanism of Moulding	C1	MK	Lecture Tutorials Small group discussion Charts	MCQ VIVA	
HomUG-ObGy-1 11.38	K & S	K		Discuss the Importance of Moulding	C1	MK	Lecture Tutorials Small group discussion Dummy	VIVA	
HomUG-ObGy-1 11.30	K & S	K		Define Caput Succedaneum	C1	MK	Lecture Tutorials Small group discussion	MCQ VIVA	SAQ
HomUG-ObGy-1 11.39	K & S	K		Describe Mechanism of formation of Caput Succedaneum	C1	MK	Lecture Tutorials Small group discussion Dummy	MCQ VIVA	SAQ
HomUG-ObGy-1 11.40	K & S	K		Discuss Importance of Caput Succedaneum	C1	MK	Lecture Tutorials	MCQ VIVA	SAQ

							Small group discussion Dummy			
HomUG-ObGy-1 11.41	K & S	K		Define False Pelvis	C 1 P 2	MK	Lecture Tutorials Small group discussion Charts	MCQ VIVA		
HomUG-ObGy-1 11.42	K & S	K		Define True Pelvis	C1 P 2	MK	Lecture Tutorials Small group discussion Pelvis	MCQ VIVA		
HomUG-ObGy-1 11.43	K & S	K		Describe the Inlet of the Pelvis	C 1 P 2	MK	Lecture Tutorials Small group discussion Pelvis	MCQ VIVA		
HomUG-ObGy-1 11.44	K & S	K		Demonstrate the diameters of the Pelvis	C1 P2	MK	Lecture Tutorials Small group discussion Pelvis	MCQ		
HomUG-ObGy-1 11.45	K & S	S		Demonstrate Inlet & outlet of the Pelvis	C1 P2	MK	Lecture Tutorials Small group discussion Pelvis	MCQ		
HomUG-ObGy-1 11.46	K & S	S		Demonstrate Mid pelvis	C1	MK	Lecture Tutorials Small group discussion	MCQ		

							Pelvis			
HomUG-ObGy-1 11.47	K & S	S		Demonstrate the anterior and transverse diameters of the pelvic inlet	C 1 P 2	MK	Lecture Tutorials Small group discussion Manikin	MCQ	SAQ	

### 6.11 Diagnosis of pregnancy, Investigations & examinations, applied anatomy & physiology, Normal pregnancy – Physiological Changes

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 12.1	K & S	K	Diagnosis of Pregnancy	Define Gestational age of Foetus	C1	DK	Lecture Tutorials Small group discussion Manikin	MCQ		
HomUG-ObGy-1 12.2	K & S	K		Define Ovulatory age of Foetus	C1	MK	Lecture Tutorials Small group discussion Manikin	MCQ		
HomUG-ObGy-1 12.3	K & S	K		Discuss the subjective symptoms in 1 <sup>st</sup> trimester of pregnancy.	C1	MK	Lecture Tutorials Small group discussion Manikin	MCQ		

HomUG-ObGy-1 12.4	K & S	K		Discuss the objective signs in 1 <sup>st</sup> trimester pregnancy.	C1	MK	Lecture Tutorials Small group discussion Manikin	MCQ	SAQ	
HomUG-ObGy-1 12.5	K & S	K		List the Immunological tests for diagnosis of Pregnancy in 1 <sup>st</sup> Trimester	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.6	K & S	K		Discuss the subjective symptoms of 2 <sup>nd</sup> trimester of pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.7	K & S	K		Discuss the objective signs of 2 <sup>nd</sup> trimester of pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.8	K & S	K		List the investigations of 2 <sup>nd</sup> trimester of pregnancy	C 2	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.9	K & S	K		Discuss the subjective symptoms of 3 <sup>rd</sup> trimester of pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1	K & S	K		Discuss the objective signs of 3 <sup>rd</sup> trimester of pregnancy	C1	MK	Lecture Tutorials	MCQ	SAQ	

12.10							Small group discussion			
HomUG-ObGy-1 12.11	K & S	K		List the investigations of 3 <sup>rd</sup> trimester of pregnancy	C2	MK	Lecture Tutorials Small group discussion\	MCQ	SAQ	
HomUG-ObGy-1 12.12	K & S	K		Discuss the Differential Diagnosis of Pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.13	K & S	K		List the signs of previous childbirth	C1	DK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 12.14	K & S	K		Describe the methods of calculation of EDD	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.15	K & S	S		Calculate EDD of Pregnant Woman using Nagele's formula	P1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.16	P C	S	Methods of Obstetrical Examination	Demonstrate the Abdominal Examination	P-2	MK	Tutorials Small group discussion Mannikin Bedside	MCQ	SAQ	
HomUG-ObGy-1	P C	K		List the types of Obstetrical grips	C 1 P 2	MK	Lecture Tutorials	MCQ	SAQ	

12.17							Small group discussion			
HomUG-ObGy-1 12.18	P C	S		Demonstrate the Obstetrical grips	C 1 P 1	MK	Lecture Tutorials Small group discussion Mannikin Bedside	MCQ		
HomUG-ObGy-1 12.19	P C	PI		Demonstrate the pelvic grips	C 1 P 2	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 12.20	K & S	K		Explain Braxton-Hicks contraction(3)	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.21	K & S	K	Physiological changes during pregnancy	Describe the physiological changes occurs in the genital organs during pregnancy.	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.22	K & S	K		Describe the physiological changes occurring in Breast during pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.23	K & S	K	Cutaneous changes	Discuss the cutaneous changes occurs during pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.24	K & S	K	Weight gain	Discuss the physiological weight gain during pregnancy	C1	MK	Lecture Tutorials	MCQ	SAQ	

							Small group discussion			
HomUG-ObGy-1 12.25	K & S	K	Metabolic	Discuss the metabolic changes occurs during pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.26	K & S	K	Physiological changes	Discuss the haematological changes occurs during pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 12.27	K & S	K	Haematological changes	Discuss the Cardio vascular changes occurs during pregnancy						
HomUG-ObGy-1 12.28	K & S	K	C V S	Discuss the Systemic changes occurs during pregnancy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	



**6.12 Antenatal care – aims, objectives, visits, advise, procedures, investigations, identifying high risk cases, scope and limitation of management in Homeopathy**

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 13.1	K & S	K	Antenatal care	Define Antenatal Care	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 13.2	K & S	K		Discuss the Aims of Antenatal Care	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 13.3	K & S	K		Discuss the Objectives of Antenatal Care	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 13.4	P C	K		Discuss the procedure at first ANC visit	C1	MK	Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 13.5	P C	K		Discuss the procedure at subsequent visits	C1	MK	Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1	P C	K		Discuss the important Investigations done for	C1	MK	Lecture Tutorials	MCQ	SAQ	

13.6				Clinical Assessment of Foetal well being			Small group discussion			
HomUG-ObGy-1 13.7	K & S	K		Discuss the important Investigations done in Late Pregnancy	C1	DK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 13.8	K & S	K		Discuss the Methods of Prenatal Genetic Screening	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 13.9	K & S	K		Discuss the Invasive procedures for Prenatal Diagnosis	C1	NK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 13.10	K & S	K		List the Non Invasive procedures for Prenatal Diagnosis	C1	NK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 13.11	K & S	K		Explain the antenatal advice given to the mother	C1 P I	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 13.12	K & S	K		Discuss the importance of Antenatal care	C1 P I	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 13.13	K & S	K		Discuss the relevance of Pre-conceptional Counselling	C1	MK	Lecture Tutorials Small group discussion	VIVA		

HomUG-ObGy-1 13.14	P C	KH	Antenatal visits	Discuss the normal antenatal visits during pregnancy	C2	MK	Lecture Tutorials Small group discussion	VIVA		
HomUG-ObGy-1 13.15	P C	KH	Antenatal diet	Discuss the antenatal diet to the pregnant mother	C2	MK	Lecture Tutorials Small group discussion Chart	MCQ		
HomUG-ObGy-1 13.16	H O	KH	Scope of homoeopathy	Discuss the Scope of Homoeopathic management in antenatal complaints	C I P 1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 13.17	H O	KH	Management in Homoeopathy	Discuss the Scope of Homoeopathic management in high risk cases pregnancy	C1 P1	MK	Lecture Tutorials Small group discussion CBL	MCQ VIVA		Organon of Medicine, Materia Medica, Repertory
HomUG-ObGy-1 13.18	H O	K	Scope & Limitations	Discuss the Limitations of Homoeopathic management in high risk pregnancy	C1 P 1	MK	Lecture Tutorials Small group discussion CBL	VIVA		Organon of Medicine, Materia Medica, Repertory

### 6.13 Common conditions such as Vomiting, backache, constipation in pregnancy and Homoeopathic Management

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 14.1	K & S	K	Vomiting in pregnancy	Define simple vomiting in pregnancy	C1	MK	Lecture/ Integrated teaching/ AV aids	MCQ VIVA		
HomUG-ObGy-1 14.2	K & S	K		Define hyperemesis gravidarum	C1	MK	Lecture/ Integrated teaching/ AV aids	MCQ VIVA		
HomUG-ObGy-1 14.3	K & S	K		List aetiology of Hyperemesis gravidarum	C1	MK	Lecture/ Integrated teaching/ AV aids		LA SAQ	
HomUG-ObGy-1 14.4	K & S	K		Discuss the clinical features of Hyperemesis gravidarum	C1	MK	Lecture/ Integrated teaching/ AV aids		SAQ	
HomUG-ObGy-1 14.5	K & S	K		Explain the Investigations required for Hyperemesis gravidarum	C1	MK	Lecture/ Integrated teaching/ AV aids		SAQ	
HomUG-ObGy-1 14.6	K & S	K		Discuss the Complications of Hyperemesis gravidarum	C1	MK	Lecture/ Integrated teaching/ AV aids		SAQ	

HomUG-ObGy-1 14.7	K & S	K		Discuss the Management of Hyperemesis gravidarum	C1	MK	Lecture/ Integrated teaching/ AV aids		SAQ	
HomUG-ObGy-1 14.8	H O	K	Homoeopathic Management	Discuss the homoeopathic Therapeutics for Hyperemesis Gravidarum	C2	MK	Lecture/ Integrated teaching/ Project Based Learning		SAQ	Materia Medica
HomUG-ObGy-1 14.9	K & S	K	Backache	List the causes of backache during pregnancy	C1	MK	Lecture/ Integrated teaching/ AV aids	MCQ VIVA	SAQ	Physiology
HomUG-ObGy-1 14.10	K & S	K		Discuss the Auxilliary management of backache during pregnancy	C2	MK	Lecture/ Integrated teaching/ AV aids	MCQ VIVA		Physiology
HomUG-ObGy-1 14.11	H O	K	Homoeopathic Management	Discuss the homoeopathic Therapeutics for Backache during Pregnancy	C2	MK	Lecture/ Integrated teaching/ Project Based Learning	MCQ VIVA	SAQ	Materia Medica
HomUG-ObGy-1 14.12	K & S	K	Constipation	Discuss the Physiological cause for constipation during pregnancy	C1	MK	Lecture/ Integrated teaching/ AV aids		SAQ	Physiology
HomUG-ObGy-1 14.13	H O	K	Homoeopathic Management	Discuss the homoeopathic Therapeutics for Constipation during Pregnancy	C2	MK	Lecture/ Integrated teaching/ Project Based Learning	MCQ VIVA	SAQ	Materia Medica
HomUG-ObGy-1 14.14	H O	K		Discuss the homoeopathic Therapeutics for Minor Ailments during Pregnancy	C2	MK	Lecture/ Integrated teaching/ Project Based Learning	MCQ VIVA	SAQ	Materia Medica

**6.13.1 Normal labour with its causes of onset, anatomy, physiology, mechanism, stages, events and clinical course in each stage, importance of Homoeopathic Scope and management**

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integrated
								Formative	Summative	
HomUG-ObGy-1 15.1	K & S	K	Normal labour	Define Normal labour	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 15.2	K & S			Define Eutocia	C I	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 15.3	K & S	K		Define Abnormal Labour	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 15.4	K & S	K		Discuss the causes of onset of labour	C1	MK	Lecture Tutorials Small group discussion		LA SAQ	Physiology
HomUG-ObGy-1 15.5	K & S	K		Describe the features of True labour pains	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 15.6	K & S	K		Describe the features of False labour pains	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	

HomUG -ObGy-1 15.7	K & S	KH		Differentiate true labour pains from false labour pains	C2	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG -ObGy-1 15.8	K & S	K		Describe the characteristic features of pre-term labour	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG -ObGy-1 15.9	K & S	K	Normal labour	Describe the Physiology of Normal Labour	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG -ObGy-1 15.10	K & S	K	Stages of labour	Classify the Stages of Normal Labour	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG -ObGy-1 15.11	K & S	K		Describe the Stages of Normal Labour	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG -ObGy-1 15.12	K & S	K		Discuss the events taking place in 1 <sup>st</sup> stage of labour	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG -ObGy-1 15.13	K & S	K	Events 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> stage of labour	Discuss the events taking place in 2 <sup>nd</sup> stage of labour	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG -ObGy-1 15.14	K & S	K		Discuss the events taking place in 3 <sup>rd</sup> stage of labour	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG -ObGy-1 15.15	K & S	K		Discuss the 1 <sup>st</sup> stage of labour & the duration	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG -ObGy-1 15.16	K & S	K		Discuss the 2 <sup>nd</sup> stage of labour & the duration	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	

HomUG -ObGy-1 15.17	K & S	K	Stages of 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> stage of labour	Discuss the 3 <sup>rd</sup> stage of labour & the duration	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG -ObGy-1 15.18	K & S	K		Discuss the 4 <sup>th</sup> stage of labour	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG -ObGy-1 15.19	K & S	K		Define Episiotomy	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG -ObGy-1 15.20	K & S	K		Discuss the types of episiotomy	C1	MK	Lecture Tutorials Small group discussion Mannikin	MCQ	SAQ	
HomUG -ObGy-1 15.21	K & S	KH		Discuss the complications of episiotomy	C2	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG -ObGy-1 15.22	K & S	K		Describe the mechanism of labour	C1 P I	MK	Lecture Tutorials Small group discussion Clinical demonstration Mannikin		LA SAQ	
HomUG -ObGy-1 15.23	K & S	K	Episiotomy	Define crowning	C1	MK	Lecture Tutorials Small group discussion Mannikin	MCQ	SAQ	
HomUG -ObGy-1 15.24	K & S	K		Define Restitution	C1	MK	Lecture Tutorials Small group discussion Mannikin	MCQ	SAQ	
HomUG -ObGy-1 15.25	K & S	KH		Discuss the management of 1 <sup>st</sup> stage of labour	C2	MK	Lecture Tutorials Small group discussion Mannikin		SAQ	



HomUG -ObGy-1 15.26	K & S	KH		Discuss the management of 2 <sup>nd</sup> stage of labour	C2	MK	Lecture Tutorials Small group discussion Mannikin		SAQ	
HomUG -ObGy-1 15.27	K & S	KH	Mechanism of labour	Discuss the management of 3 <sup>rd</sup> stage of labour	C2	MK	Lecture Tutorials Small group discussion Mannikin		SAQ	
HomUG -ObGy-1 15.28	K & S	KH	Managemen t of 1 <sup>st</sup> , 2 <sup>nd</sup>  3 <sup>rd</sup> , and 4 <sup>th</sup> stage of labour	Discuss the management of 4 <sup>th</sup> stage of labour	C2	MK	Lecture Tutorials Small group discussion Mannikin		SAQ	
HomUG -ObGy-1 15.29	H O	KH	Scope and limitation of homeopathy	Discuss the Scope of Homoeopathic in Labour normal Labour	C2	MK	Lecture Tutorials Small group discussion		LA SAQ	
HomUG -ObGy-1 15.30	H O	K	Scope and limitation of homeopathy	Discuss the limitation of Homoeopathy Labour	C1 P I	MK	Lecture Tutorials Small group discussion		LA SAQ	
HomUG -ObGy-1 15.31	H O	KH	Homoeopat hic Materia medica	Discuss the homoeopathic remedies in labour	C2	MK	Lecture Tutorials Small group discussion	MCQ	LA SAQ	
HomUG -ObGy-1 15.32	H O	KH	&therapeuti cs	Discuss the characteristic features of indicated remedies	C2	MK	Lecture Tutorials Small group discussion	MCQ	LA SAQ	

#### 6.14 Postnatal & puerperal care – scope and limitation of management in Homoeopathy

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 16.1	K & S	K	Postnatal care	Define postnatal care	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.2	K & S	K	Puerperium	Define Puerperium	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.3	K & S	K		Explain the duration of normal puerperium	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.4	K & S	K		Define Involution	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.5	K & S	K		Define Sub-involution	C1	MK	Lecture Tutorials Small group discussion	MCQ		

HomUG-ObGy-1 16.6	K & S	K		Discuss the Anatomical Consideration of Involution of Uterus	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.7	K & S	K		Discuss the Physiological Consideration of Involution of Uterus	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.8	K & S	D		Demonstrate the clinical Assessment of Involution of Uterus	P-1	MK	Lecture Tutorials Small group discussion	MCQ VIVA	SAQ	
HomUG-ObGy-1 16.9	K & S	K		Discuss the Involution of other Pelvic Structures	C1	MK	Lecture Tutorials Small group discussion	VIVA		
HomUG-ObGy-1 16.10	K & S	K		Define lochia	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.11	K & S	K		Describe the types of Lochia	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 16.12	K & S	K		Discuss the composition of lochia	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 16.13	K & S	K		Mention the normal duration of Lochia	C1	MK	Lecture Tutorials Small group discussion	MCQ		

HomUG-ObGy-1 16.14	K & S	K		Discuss the clinical importance of Lochia	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 16.15	K & S	K		Discuss the Normal Physiological changes occurs during puerperium.	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 16.16	K & S	K		Discuss the general management during Puerperium	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 16.17	H O	KH	Homoeopathic Management	Discuss the homoeopathic remedies for puerperium.	C2	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 16.18	H O	KH		Discuss the characteristic features of indicated remedies	C2	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 16.19	K & S	K		Define Lactation	C1	MK	Lecture Tutorials Small group discussion	MCQ VIVA		
HomUG-ObGy-1 16.20	K & S	K		Define Colostrum	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 16.21	K & S	K		List Composition of Colostrum	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	

HomUG-ObGy-1 16.22	K & S	K		Describe the 4 stages in Physiology of Lactation	C1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 16.23	H O	KH	Homoeopathic Management	Discuss the homoeopathic remedies for increasing the milk	C2	MK	Lecture Tutorials Small group discussion		SAQ	Materia Medica
HomUG-ObGy-1 16.24	K & S	KH		Discuss the characteristic features of indicated remedy	C2	MK	Lecture Tutorials Small group discussion		SAQ	Materia Medica
HomUG-ObGy-1 16.25	K & S	K	Postnatal care	Define Postnatal care	C1	MK	Lecture Tutorials Small group discussion	MCQ		
HomUG-ObGy-1 16.26	K & S	K		Discuss the Objectives of postnatal care	C1	MK	Lecture Tutorials Small group discussion	MCQ	SAQ	
HomUG-ObGy-1 16.27	K & S	S		Demonstrate the procedure of Postnatal examination of the Mother	C1	DK	Lecture Tutorials Small group discussion			
HomUG-ObGy-1 16.28	K & S	S		Demonstrate the procedure of Postnatal examination of the Baby	C1 P I	DK	Lecture Tutorials Small group discussion			
HomUG-ObGy-1 16.29	K & S	K		Discuss the advice given to the postnatal mother	P I	MK	Lecture Tutorials Small group discussion		SAQ	

HomUG-ObGy-1 16.30	H O	KH	Homoeopathic management	Discuss the Scope of Homoeopathic remedies in Postnatal care	C2	MK	Lecture Tutorials Small group discussion		SAQ	Materia medica
HomUG-ObGy-1 16.31	H O	K		Discuss the Limitation of Homoeopathic management in postnatal puerperal case	C1 P 1	MK	Lecture Tutorials Small group discussion		SAQ	Organon of medicine

#### 6.15 Care of new born in homoeopathic point of view:

Sl. No.	Domain Competency	Miller	Content	Specific Learning Objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 17.1	K & S	K	New born infant	Define New born infant	C1	MK	Lecture Tutorials Small group discussion	MCQ		Paediatrics
HomUG-ObGy-1 17.2	K & S	K		Explain weaning of infant.	C1 P I	MK	Lecture Tutorials Small group discussion Clinical demonstration	VIVA		

HomUG-ObGy-1 17.3	K & S	K	New born infant	Describe the physical features of new born infant at birth	C 1	MK	Lecture Tutorials Small group discussion Clinical demonstration		SAQ	
HomUG-ObGy-1 17.4	K & S	S		Demonstrate the vital signs of new born infant immediate after birth.	C 1 P I	MK	Lecture Tutorials Small group discussion Manikin Bedside	MCQ		
HomUG-ObGy-1 17.5	K & S	S		Demonstrate the general physical examination findings of new born	C1 P I	MK	Lecture Tutorials Small group discussion Clinical demonstration	MCQ		
HomUG-ObGy-1 17.6	K & S	S		Elicit the reflexes of new born	C1	MK	Lecture Tutorials Small group discussion Clinical bed side demonstration	MCQ		
HomUG-ObGy-1 17.7	K & S	KH		Explain the Immediate care of new born	C1 P I	MK	Lecture Tutorials Small group discussion Manikin Bedside		SAQ	
HomUG-ObGy-1 17.8	K & S	K		Discuss the advantage of breast feeding	C1 P I	MK	Lecture Tutorials Small group discussion		SAQ	

HomUG-ObGy-1 17.9	K & S	K	Breast feeding	Discuss the contraindications for breast feeding	C1 P 1	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 17.10	K & S	KH		Describe the indication for Artificial feeding.	C 2	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 17.11	K & S	KH		Discuss the difficulties faced during breast feeding due to mother & Baby	C2	MK	Lecture Tutorials Small group discussion		SAQ	
HomUG-ObGy-1 17.12	K & S	KH		Discuss the Daily Observation and care of new born	C2	DK	Lecture Tutorials Small group discussion		SAQ	Paediatrics
HomUG-ObGy-1 17.13	K & S	S		Discuss Infant Growth Assessment	C1	NK	Lecture Tutorials Small group discussion		SAQ	Paediatrics
HomUG-ObGy-1 17.14	K & S	K		Define APGAR Score of Newborn	C1	MK	Lecture Tutorials Small group discussion Clinical demonstration	MCQ	SAQ	Paediatrics
HomUG-ObGy-1 17.15	K & S	K		Describe the parameters of APGAR Scoring of New-born	C1 P 1	MK	Lecture Tutorials Small group discussion Clinical demonstration		SAQ	Paediatrics
HomUG-ObGy-1 17.16	K & S	K		Discuss importance of performing APGAR	C1	DK	Lecture Tutorials	MCQ	SAQ	Paediatrics



				Scoring at intervals after birth			Small group discussion			
HomUG-ObGy-1 17.17	H O	KH	Homoeopathic Management	Discuss the Scope of Homoeopathy in New born Care	C2	MK	Lecture Tutorials Small group discussion		SAQ	Organon of medicine
HomUG-ObGy-1 17.18	H O	KH	Homoeopathic Management	Discuss Homoeopathic remedies in new born care	C2	MK	Lecture Tutorials Small group discussion	SAQ		Materia medica
HomUG-ObGy-1 17.19	H O	K		Discuss the characteristic features of indicated remedies	C2	MK	Lecture Tutorials Small group discussion	SAQ		Materia medica

**6.16 General and Homoeopathic management, repertorisation, therapeutics, posology. Formulation of prognostic criteria and Prognosis of related topics in Obstetrics and new born care**

Sl. No.	Domain Competency	Miller	Content	Specific learning objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integrated
								Formative	Summative	
HomUG-ObGy-1 18.1	H O	KH	Homoeopathic therapeutics	Discuss the Homoeopathic materia medica & therapeutics in Antenatal ailments	C2	MK	Lecture Tutorials Small group discussion		SAQ	Materia medica
HomUG-ObGy-1 18.2	H O	KH		List the Homoeopathic remedies commonly used in obstetrics	C2	MK	Lecture Tutorials Small group discussion		SAQ	Materia medica
HomUG-ObGy-1 18.3	H O	KH		Discuss the characteristic features of the indicated remedies.	C2	MK	Lecture Tutorials Small group discussion		SAQ	Materia medica
HomUG-ObGy-1 18.4	H O	KH		List the Homoeopathic remedies commonly used in New born care	C2	MK	Lecture Tutorials Small group discussion		SAQ	Materia medica
HomUG-ObGy-1 18.5	H O	KH		Discuss the characteristic features of indicated remedies	C2	MK	Lecture Tutorials		SAQ	Materia medica

							Small discussion group			
HomUG-ObGy-1 18.6	H O	KH		Discuss the differentiation of the remedies	C1	MK	Lecture Tutorials Small discussion group	MCQ		Materia medica
HomUG-ObGy-1 18.7	H O	KH		Discuss the remedy relationship wherever applicable	C1	MK	Lecture Tutorials Small discussion group	MCQ		Materia medica
HomUG-ObGy-1 18.8	H O	KH	Repertorisation	Discuss the selection of repertories in Obstetrical care	C-3	MK	Lecture Tutorials Small discussion group	MCQ		Repertory
HomUG-ObGy-1 18.9	H O	KH		Discuss the selection of repertories in New born care	C-3	MK	Lecture Tutorials Small discussion group	MCQ		Repertory
HomUG-ObGy-1 18.10	H O	S		Explain how to convert symptoms into rubrics from different repertories in Obstetricas.	C-3	MK	Lecture Tutorials Small discussion group	MCQ		Repertory
HomUG-ObGy-1 18.11	H O	S		Explain how to convert symptoms into rubrics from different repertories in New born care.	C-3	MK	Lecture Tutorials Small discussion group	MCQ		Repertory
HomUG-ObGy-1 18.12	H O	K		Discuss the selection of repertory based on symptomatology	C-1	MK	Lecture Tutorials Small discussion group	MCQ		Repertory

HomUG-ObGy-1 18.13	H O	KH	Posology	Discuss the selection of similimum based on symptomatology	C1	MK	Lecture Tutorials Small group discussion	MCQ		Organon of medicine
HomUG-ObGy-1 18.14	H O	KH		Describe methods of potency selection	C1	MK	Lecture Tutorials Small group discussion	MCQ		Organon of medicine
HomUG-ObGy-1 18.15	H O	K		Discuss the factors for selection of posology.	C1	MK	Lecture Tutorials Small group discussion	MCQ		Organon of medicine
HomUG-ObGy-1 18.16	H O	K		Discuss the criteria for repetition of doses	C1	MK	Lecture Tutorials Small group discussion	MCQ		Organon of medicine

### 6.17 Important Investigations for diagnosis in Obstetrics

Sl. No.	Domain Competency	Miller	Content	Specific learning objectives	Bloom/ Guilbert	Priority	TL MM	Assessment		Integration
								Formative	Summative	
HomUG-ObGy-1 19.1	P C	K	Ultrasonography	Discuss the indications for USG in 1 <sup>st</sup> trimester.	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.2	P C	K		Discuss the findings of hydatidiform mole in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.3	P C	K		Discuss the finding of abortion in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.4	P C	K		Discuss the findings of normal pregnancy in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology

HomUG-ObGy-1 19.5	P C	K		Discuss the findings of Anterio – posterior diameters of the fetal skull in USG.	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.6	P C	K		Discuss the findings of biparietal (BPD) diameters of the fetal skull in USG.	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.7	P C	K		Discuss the findings of Crown Rump Length in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.8	P C	K		Discuss the findings of Amniotic fluid in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.9	P C	K		Discuss the findings of foetal growth in each trimester in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.10	P C	K		Discuss the findings of Malformations of the foetus in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology

HomUG-ObGy-1 19.11	P C	K		Discuss the findings of malformation of the uterus in USG	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Radiology
HomUG-ObGy-1 19.12	P C	K		Discuss the urine test pregnancy test in amenorrhoea women	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Biochemistry
HomUG-ObGy-1 19.13	P C	K		Discuss the immunological test for pregnancy	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Biochemistry
HomUG-ObGy-1 19.14	P C	K		Discuss the conditions where B-HCG tests are done.	C1	DK	Small discussion group Tutorials CBL PBL			Biochemistry
HomUG-ObGy-1 19.15	P C	K	Blood test	Discuss the importance of Hb in pregnancy.	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Biochemistry
HomUG-ObGy-1 19.16	P C	K		Discuss the importance of blood group & Rh group in pregnancy.	C1	MK	Small discussion group Tutorials CBL PBL	MCQ		Biochemistry

HomUG-ObGy-1 19.17	P C	K		Discuss the importance of FBS, RBS and PPBS in pregnancy	C1	MK	Small group discussion Tutorials CBL PBL	MCQ		
HomUG-ObGy-1 19.18	P C	K		Describe the importance of Thyroid function tests in pregnancy	C1	MK	Small group discussion Tutorials CBL PBL	MCQ		

## 7 Teaching learning methods

Lectures (Theory)	Non-lectures (Practical/Demonstrative)
Lectures	Clinical demonstration
Small group discussion	Problem based discussion
Integrated lectures	Case based learning
	Assignments
	Library reference
	Self-learning



## 8 Details of assessment

***Note-*** The assessment in II BHMS shall be done only as Internal Assessment (IA) in terms of Periodical Assessments ( PA) and Term Tests (TT) as detailed below. There shall not be any Final University Examination (FUE) at this level. The marks obtained in IA during II BHMS will be added to the marks of IA in the III BHMS University Examination.

### Overall Scheme of Internal Assessment (IA)\*\*\*

Professional Course/ Subject	Term I (1-6 Months)		Term II (7-12 Months)	
II BHMS/ Practice of Medicine	PA I (end of 3 months)	TT I (end of 6 months)	PA II (end of 9 months)	TT II (end of 12 months)
	20 Marks Viva- <b>A</b>	100 Marks Clinical/Practical and Viva - <b>E</b>  i) Viva voce -50 marks ii) Clinical/practical*- 50	20 Marks Viva- <b>B</b>	100 Marks Clinical/Practical and Viva - <b>F</b>  i) Viva voce -50 marks ii) Clinical/practical**- 50

#### ***\*Practical Examinations TT I:***

- a) **Case taking:** Recording of case in Obstetrics & Gynaecology. **(20 marks)**
- b) **Demonstration: ( 15 Marks)**
  - General physical examination
  - Per abdominal examination
  - Pelvic grips
- c) **Lab Investigations:** Suggest the relevant lab investigations for 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> trimester ( **5 marks**)
- d) **Demonstration of foetal skull & Pelvic diameters (10 marks)**

**\*\*Practical Examinations TT II:**

- a) **Case taking:** Recording of case taking in Obstetrics & Gynaecology. **(20 marks).**
- b) **Examination of the patient (10 marks)**
  - General physical examination
  - Breast examination
  - Obstetric examinations
  - Post-natal examinations.
  - New born care examination
- c) **Analysis of the case ( 5 marks)**
- d) **Journal submission - 5 cases (10 marks)**

Journal shall have following cases with analysis-

Gynaec-3, ANC-1, PNC-1
- e) **Dummy & Pelvis:** Demonstration of fetal skull diameters, Sutures and pelvic diameters. **(05 marks)**

**\*\*\*Method of Calculation of Internal Assessment Marks in II BHMS for Final University Examination to be held in III BHMS:**

Marks of PA I	Marks of PA II	Periodical Assessment Average PA I+ PA II /2	Marks of TT I	Marks of TT II	Terminal Test Average TT I + TT II / 200 x 20	Final Internal Assessment Marks
A	B	D	E	F	G	D+G/2

## 9 List of recommended text/reference books

- Dutta,D.C,(2023).*Text book of Obstetrics*,10<sup>th</sup>edition, New Central Book Agency Pvt Ltd.,
- Dutta D.C (2020).*Text book of Gynaecology*, 8<sup>th</sup> edition, New Central Book Agency Pvt Ltd.
- Lilienthal Samuel (Reprint 2003), *Homoeopathic Therapeutics*, 5 edition B Jain Publishers (P) Ltd
- Guernsey H.N. *Principles & Practice of Homoeopathy in Obstetrics & Paediatrics*.
- Minton, *Uterine therapeutics Materiamedica& Repertory*, B Jain publishers (P) Ltd.

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