SYLLABUS
UG Programme- ANATOMY

MBBS- First Year

(Competency Based Undergraduate Curriculum will be implemented to MBBS batch admitted from Academic year admitted 2019-20 onwards) Amended in 01 August 2023

CBME CURRICULUM

1. **Preamble**

The new Graduate Medical Education Regulations attempt to stand on the shoulders 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 adapting them to the changing demography. Socio-economic context, perceptions, values, advancements in medical education, and expectations of stakeholders. Emerging healthcare issues particularly in the context of emerging diseases, the 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 have made this job easier. A comparison between the 1997 Regulations and the 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 of the new regulations is the 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 that conforms to global trends. Emphasis is made on the 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 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 the 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 the medical profession fulfil his social obligations towards the realization of this goal.

b) Learn key aspects of National policies on health and devote himself to its practical implementation.

c) Achieve competence in the practice of holistic medicine, encompassing promotive, preventive, curative, and rehabilitative aspects of common diseases.

d) Develop a scientific temper, acquire educational experience for proficiency in the profession, and promote healthy living.

e) Become exemplary citizen by observance of medical ethics and fulfilling social and professional obligations, 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 the 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 the 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 a 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 (MCI--I)
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 levels of service delivery;
VII. Bio-medical waste disposal
VIII. Organizational and or institutional arrangements

g) Acquire basic management skills in the areas of human resources, materials, and resource management related to health care delivery, general and hospital management, principal inventory skills, and counselling.

h) Be able to identify community health problems and learn to work to resolve these by designing. Instituting corrective steps and evaluating the 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

To fulfil 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, analyse, synthesize, and communicate health data appropriately.

c) Communicator with patients, families, colleagues, and the 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 a medical education curriculum that focuses on the desired and observable ability in real-life situations. To effectively fulfil 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, biological, clinical, behavioural, and social perspective.
- Demonstrate knowledge of abnormal human structure, function, and development from a molecular, cellular, biological, clinical, behavioural, 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 the 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 to address patient problems, generate differential diagnoses, and develop individualized management plans that include preventive, promotive, and therapeutic goals.
- Maintain accurate, clear, and appropriate records 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 programmes 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 healthcare team respecting the diversity of roles, responsibilities, and competencies of other professionals.
- Recognize and function effectively, responsibly, and appropriately as a healthcare team leader in primary and secondary healthcare settings.
- Educate and motivate other members of the team and work in a collaborative and collegial fashion that will help maximize the healthcare 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, analyse, and utilize health data.
- Participate appropriately and effectively in measures that will advance the quality of health care and patient safety within the health care system.
- Recognize and advocate health, promotion, disease prevention and healthcare quality improvement through prevention and early recognition: of a) lifestyle diseases and b) cancer, in collaboration with other members of the healthcare 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), 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.

A professional who is committed to excellence is ethical, responsive, and accountable to patients, the 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

➢ **1st Professional Year**:

1. ANATOMY

a. Competencies:

The undergraduate must demonstrate:

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

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 the elementary ultrastructure 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 analyse 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 the clinical basis of some common clinical procedures i.e. intramuscular and intravenous injection, lumbar puncture 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 scans, sonograms, MIL and 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.

Competencies or Course Outcomes

At the end of the First Professional Year Phase, one Student must be able to complete the study of the following competencies

Competency No.	Topics and Subtopics
1	**Anatomical Terminology**
AN1.1	Anatomical position, planes, and movements in our body
AN1.2	Composition of bone and bone marrow
2	**General features of Bones and Joints**
AN2.1	Parts, blood and nerve supply of long bone
AN2.2	Laws of ossification
AN2.3	Features of sesamoid bone
AN2.4	Cartilage
AN2.5	Types of Joints and Examples
AN2.6	Nerve supply of joints and Hilton's law
3	**General features of Muscle**
AN3.1	Classification of muscles
AN3.2	Parts of skeletal muscle
AN3.3	Shunt and spurt muscles
4	**General features of skin and fascia**
AN4.1	Types of Skin Dermatomes in body
AN4.2	Structure and function of skin
AN4.3	Superficial fascia
AN4.4	Deep fascia
AN4.5	Principles of skin incisions
5	**General features of the cardiovascular system**
AN5.1	Blood Lymph and vascular system
AN5.2	Pulmonary and systemic circulation
AN5.3	Arteries and Veins
AN5.4	Functional Classification of Vessels
AN5.5	Portal System
AN5.6	Anastomoses
AN5.7	Meta-arterioles, sphincters and AV anastomoses
AN5.8	Thrombosis, infarction and aneurysm
6	**General Features of the lymphatic system**
AN6.1	Components and functions of the Lymphatic system
AN6.2	Lymph capillaries and Circulation

Competency No.	Topics and Subtopics
AN6.3	Lymphoedema and tumour spread
7	**Introduction to the Nervous System**
AN7.1	General plan and components of CNS, ANS, and PNS.
AN7.2	Components of nervous tissue and functions
AN7.3	Classifications and parts of neuron
AN7.4	Typical spinal nerve
AN7.5	Principles of innervation of muscles
AN7.6	Loss of innervation of a muscle and applied anatomy
AN7.7	Synapse - types
AN7.8	Ganglia
8	**Features of individual bones (Upper Limb)**
AN8.1	Bones of upper limb
AN8.2	Joints formed by bones of the upper limb
AN8.3	Peculiarities of clavicle
AN8.4	Muscle attachments of bones
AN8.5	Articulated hand
AN8.6	Scaphoid fracture
9	**Pectoral region**
AN9.1	Pectoralis major and pectoralis minor
AN9.2	Breast
AN9.3	Development of breast
10	**Axilla, Shoulder and Scapular region**
AN10.1	Boundaries and Contents of the axilla
AN10.2	Axillary artery and Vein
AN10.3	Brachial plexus
AN10.4	Axillary lymph nodes
AN10.5	Variation in brachial plexus
AN10.6	Erb's Palsy and Klumpke's paralysis
AN10.7	Enlarged axillary lymph nodes
AN10.8	Trapezius and latissimus dorsi
AN10.9	Anastomosis around the scapula and triangle of auscultation
AN10.10	Deltoid and rotator cuff muscles
AN10.11	Serratus anterior
AN10.12	Shoulder joint
AN10.13	Axillary nerve injury during IM injections

Competency No.	Topics and Subtopics
11	**Arm and Cubital fossa**
AN11.1	Biceps and triceps brachii
AN11.2	Important nerves and vessels in the arm
AN11.3	Venipuncture of cubital veins
AN11.4	Saturday night palsy
AN11.5	Cubital fossa
AN11.6	Elbow joint anastomosis
12	**Forearm and hand**
AN12.1	Muscle groups of the ventral forearm
AN12.2	Nerves and vessels of the forearm
AN12.3	Flexor retinaculum
AN12.4	Carpal tunnel syndrome
AN12.5	Muscles of hand. movements of thumb
AN12.6	Movements of thumb
AN12.7	Vessels and nerves in the hand
AN12.8	Claw hand
AN12.9	Fibrous flexor sheaths, synovial sheaths
AN12.10	Infection of Fascial spaces of palm
AN12.11	Muscle groups of dorsal forearm
AN12.12	Nerves and vessels of the back of the forearm
AN12.13	Wrist drop
AN12.14	Extensor retinaculum
AN12.15	Extensor expansion formation
13	**General Features, Joints, radiographs and surface marking**
AN13.1	Fascia, compartments, veins and lymphatic of upper limbs
AN13.2	Dermatomes of upper limbs
AN13.3	Joints of the upper limb
	Elbow, Radio-ulnar, wrist and first carpometacarpal joint)
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AN13.1	Fascia, compartments, veins and lymphatic of upper limbs
AN13.2	Dermatomes of upper limbs
AN13.3	Joints of the upper limb: Elbow, Radio-ulnar, wrist and first carpometacarpal joint)
AN13.4	Joints of the upper limb: Sternoclavicular, Acromioclavicular, Carpometacarpal joints and Metacarpophalangeal joints
AN13.5	Radiographs of UL
AN13.6	Bony landmarks of UL
AN13.7	Surface projection of vessels, testing of muscle
AN13.8	Development of UL
14	**Features of individual bones (Lower Limb)**
AN14.1	Features of given bones
AN14.2	Joints formed by given bone
AN14.3	Importance of ossification of the femur and the tibia
AN14.4	Articulated foot
15	**Front and Medial side the of thigh**
AN15.1	Nerves and vessels of the thigh
AN15.2	Major Muscles
AN15.3	Femoral triangle

Competency No.	Topics and Subtopics
AN15.4	Psoas abscess and Femoral hernia
AN15.5	Adductor canal
16	**The Gluteal region and back of the thigh**
AN16.1	Nerves and vessels
AN16.2	Sciatic nerve injury
AN16.3	Trendelenburg sign
AN16.4	Hamstrings muscle
AN16.5	Nerve and vessels of the back of the thigh
AN16.6	Popliteal fossa
17	**The Hip Joint**
AN17.1	Gross anatomy of the hip joint
AN17.2	Fracture of neck of femur
AN17.3	Dislocation
18	**Knee joint, Anterolateral compartment the of leg and dorsum of the foot**
AN18.1	Major muscles
AN18.2	Nerves and vessels
AN18.3	Foot drop
AN18.4	Knee joint
AN18.5	Locking and unlocking
AN18.6	Knee joint injuries with its applied anatomy
AN18.7	Osteoarthritis
19	**Back of leg and sole**
AN19.1	Major muscles
AN19.2	Nerves and Vessels
AN19.3	Peripheral heart
AN19.4	Rupture of calcaneal tendon
AN19.5	Arches of foot
AN19.6	Flat and club foot
AN19.7	Metatarsalgia and plantar fasciitis
20	**General Features, joints, radiographs and surface marking**
AN20.1	Tibiofibular and ankle joint
AN20.2	Subtalar and transverse tarsal joints
AN20.3	Fascia, venous drainage, lymphatic Retinacula and dermatomes of Lower limb
AN20.4	Enlarged inguinal lymph nodes

Competency No.	Topics and Subtopics
AN20.5	Varicose veins and deep vein thrombosis
AN20.6	Radiographs of lower limb
AN20.7	Bony landmarks
AN20.8	Vessels of lower limb palpation
AN20.9	Surface projection nerves and veins
AN20.10	Development of lower limb
21	**Thoracic Sage**
AN21.1	Sternum, Typical Rib, first Rib and typical thoracic vertebra
AN21.2	A typical Ribs and vertebra
AN21.3	Thoracic inlet, cavity, and outlet
AN21.4	Intercostal muscles
AN21.5	Typical intercostal nerve
AN21.6	Intercostal vessels
AN21.7	A typical intercostal nerve subcostal artery, superior Artery
AN21.8	Joints of thorax
AN21.9	Mechanics of respiration
AN21.10	Costochondral and interchondral joints
AN21.11	Mediastinum
22	**Heart and Pericardium**
AN22.1	Pericardium
AN22.2	Each chamber of the heart
AN22.3	Coronary arteries
AN22.4	Ischemic heart disease
AN22.5	Coronary sinus
AN22.6	The fibrous skeleton of the heart
AN22.7	Conducting system of the heart
23	**Mediastinum**
AN23.1	Oesophagus
AN23.2	Thoracic duct
AN23.3	Superior Vena Cava, Azygos, hemi azygous and accessory hemi azygous veins
AN23.4	Arch of the aorta and descending aorta
AN23.5	Thoracic sympathetic chain
AN23.6	Splanchnic nerves
AN23.7	Lymphatic duct
24	**Lungs and Trachea**
AN24.1	Pleura, Pleural, recess and applied anatomy

Competency No.	Topics and Subtopics
AN24.2	Root of lung and bronchial tree
AN24.3	Broncho pulmonary segment
AN24.4	Phrenic nerve
AN24.5	Blood Supply nerve supply Lymphatic drainage of Lungs
AN24.6	Trachea
25	**Thorax**
AN25.1	Draw and label microanatomy of trachea and lung
AN25.2	Development of pleura, lung and heart
AN25.3	Foetal circulation
AN25.4	Atrial septal defect, Ventricular septal defect, Fallot's tetralogy and Tracheo-oesophageal fistula
AN25.5	Transposition of great vessels, Dextrocardia, Patent Ductus Arteriosus and Coarctation of aorta
AN25.6	Development of aortic arch arteries, SVC, IVC and coronary Sinus.
AN25.7	Chest Radiograph AP and Lateral view
AN25.8	Barium swallow
AN25.9	Surface projection of pleura heart lungs
26	**Skull Osteology**
AN26.1	Anatomy of skull bones
AN26.2	Skull Norma
AN26.3	Interior of skull
AN26.4	Mandible
AN26.5	Typical and Atypical cervical vertebrae (Atlas and axis)
AN26.6	Bones that ossify in the membrane
AN26.7	7th cervical vertebra
27	**Scalp**
AN27.1	Scalp, Blood supply, Nerve supply, Layers and Surgical importance
AN27.2	Emissary's veins
28	**Face and Parotid region**
AN28.1	Facial muscles
AN28.2	Nerve supply of facial muscles
AN28.3	Facial vessels
AN28.4	Facial Nerve
AN28.5	Cervical Lymph node
AN28.6	Superficial muscles of the face
AN28.7	Facial Nerve Palsy
AN28.8	Deep facial vein
AN28.9	Parotid gland

Competency No.	Topics and Subtopics
AN28.10	Frey's syndrome Can be covered with 28.3
29	**Posterior triangle of neck**
AN29.1	Sternocleidomastoid
AN29.2	Erb's and Klumpke's palsy
AN29.3	wry neck
AN29.4	Omohyoid, Scalenae and Levator scapulae
30	**Cranial cavity**
AN30.1	Cranial fossa
AN30.2	Foramina
AN30.3	Dural venous sinuses
AN30.4	Cavernous sinuses
AN30.5	Visual Pathways
31	**Orbit**
AN31.1	Extra ocular muscles
AN31.2	Nerves and vessels in the orbit
AN31.3	Horner's syndrome
AN31.4	Lacrimal apparatus
AN31.5	3rd, 4th and 6th Cranial Nerves
32	**Anterior Triangle**
AN32.1	Anterior triangle
AN32.2	Carotid, muscular, digastric, and submental triangles
33	**Temporal and Infratemporal regions**
AN33.1	Temporal and infratemporal fossae
AN33.2	Muscle of mastication
AN33.3	Temporomandibular joint
AN33.4	Pterygoid venous plexus
AN33.5	Dislocation with Temporomandibular joint
34	**Submandibular region**
AN34.1	Submandibular Salivary Gland and Ganglion
AN34.2	Submandibular stones
35	**Deep Structures in the neck**
AN35.1	Deep Cervical Fascia
AN35.2	Thyroid gland
AN35.3	Subclavian Artery
AN35.4	internal jugular and Brachiocephalic vein

Competency No.	Topics and Subtopics
AN35.5	Cervical lymph nodes
AN35.6	Cervical Sympathetic chain
AN35.7	IX, X, XI, and XII, Cranial nerve
AN35.8	Thyroid Swellings
AN35.9	Clinical features of compression by Cervical rib
AN35.10	Fascial Spaces of the neck
36	**Mouth, pharynx and palate**
AN36.1	Soft palate, Palatine tonsil
AN36.2	Waldeyer's Lymphatic Ring
AN36.3	Pyriform fossa and Applied
AN36.4	Tonsils and Adenoids with applied anatomy
AN36.5	Clinical significance of Kilian's dehiscence
37	**Cavity of Nose**
AN37.1	Nasal septum, lateral wall of Nose,
AN37.2	Paranasal sinuses
AN37.3	Maxillary sinus –Applied Anatomy
38	**Larynx**
AN38.1	Intrinsic and Extrinsic muscles of larynx
AN38.2	Anatomical aspects of laryngitis
AN38.3	Recurrent laryngeal nerve Injury
39	**Tongue**
AN39.1	Tongue
AN39.2	XII Cranial hypoglossal Applied Anatomy
40	**Organs of hearing and equilibrium**
AN40.1	External ear
AN40.2	Middle ear
AN40.3	Internal ear
AN40.4	Applied Anatomy otitis externa / media
AN40.5	Myringotomy
41	**Eyeball**
AN41.1	Eyeball
AN41.2	Eyeball applied cataract, glaucoma and central retinal artery occlusion
AN41.3	Intraocular muscles
42	**Back region**
AN42.1	Vertebral canal

Competency No.	Topics and Subtopics
AN42.2	Sub occipital triangle
AN42.3	Semi spinalis capitis and Splenius Capitis
43	**Head and neck joints, Histology, Development, Radiography and surface marking**
AN43.1	Movements with muscles producing the movements of the atlantooccipital joint and atlantoaxial joint
AN43.2	Pituitary, Thyroid, parathyroid and Salivary gland tongue, Epiglottis, Cornea, Retina
AN43.3	Microanatomy of olfactory epithelium, Eyelid, lip. The optic nerve, pineal gland
AN43.4	Development and anomalies of face, palate, tongue, brachial apparatus pituitary gland, Thyroid, Eye
AN43.5	Muscles of facial expression, extraocular muscles palpation of carotid, superficial temporal, facial arteries, location of the internal jugular and Ext. jugular veins. hyoid bone, thyroid cartilage, cricoid cartilage
AN43.6	Surface anatomy thyroid, parotid gland common carotid artery, IJV, SCV, EJV, facial artery.
AN43.7	X-Ray skull AP and Lat. view
AN43.8	Carotid and vertebral Angiogram
AN43.9	Structures in carotid and vertebral angiogram
44	**Anterior abdominal wall**
AN44.1	Planes, Quadrants of the abdomen.
AN44.2	Fascia, nerves and Blood supply of ant. Abdominal wall.
AN44.3	Rectus sheath
AN44.4	Inguinal canal
AN44.5	Inguinal Hernia
AN44.6	Muscles of Ant. Abdominal wall
AN44.7	Common Abdominal incisions
45	**Posterior abdominal wall**
AN45.1	Thoracolumbar fascia
AN45.2	Lumbar plexus
AN45.3	Back muscles
46	**Male external genitalia**
AN46.1	Testis and its descent
AN46.2	Epididymis
AN46.3	Penis
AN46.4	Varicocele
AN46.5	Phimosis and circumcision
47	**Abdominal cavity**
AN47.1	Lesser and Greater sac

Competency No.	Topics and Subtopics
AN47.2	Peritoneal folds and pouches
AN47.3	Ascites and peritonitis
AN47.4	Subphrenic Abscess
AN47.5	Major Viscera
AN47.6	Accessory spleen, Kehr's sign, Vagotomy, Liver biopsy
AN47.7	Calot's triangle
AN47.8	Portal vein, Inferior Vena Cava, Renal vein
AN47.9	Abdominal aorta, coeliac trunk
AN47.10	Portosystemic Anastomosis
AN47.11	Portal Hypertension
AN47.12	Nerve plexus post. Abdominal wall.
AN47.13	Thoraco abdominal diaphragm
AN47.14	Diaphragmatic Hernia
48	**Pelvic wall and viscera**
AN48.1	Muscles of the pelvic diaphragm
AN48.2	Male and female pelvic viscera
AN48.3	Internal iliac Artery
AN48.4	Sacral plexus
AN48.5	Uterine anomalies anal fistula
AN48.6	Automatic bladder
AN48.7	Gross Anatomy of Prostate, Benign Prostatic Hypertrophy (BPH) and prostate cancer
AN48.8	P/V and P/R examination
49	**Perineum**
AN49.1	Superficial and deep perineal pouches
AN49.2	Perineal body
AN49.3	Perineal Membrane in male and female
AN49.4	Ischiorectal fossa
AN49.5	Perineal tear, episiotomy perineal abscess and Anal fissure
50	**Vertebral Column**
AN50.1	Curvatures of vertebral Column
AN50.2	Intervertebral joint and sacroiliac joint, Pubic symphysis
AN50.3	Lumbar puncture
AN50.4	Scoliosis, lordosis, PID, Spina bifida, Spondylolisthesis
51	**Sectional Anatomy**
AN51.1	Cross section at T8, T10, and L1
AN51.2	Midsagittal section male and female pelvis

Competency No.	Topics and Subtopics
52	**Histology and Embryology**
AN52.1	Gastrointestinal Tract
AN52.2	Excretory system
AN52.3	Cardio-oesophageal junction, Corpus luteum
AN52.4	Development of anterior abdominal wall
AN52.5	Congenital anomalies of Diaphragm
AN52.6	Congenital anomalies of foregut midgut hindgut
AN52.7	Urinary System Development
AN52.8	Reproductive system Development
53	**Osteology**
AN53.1	Bone – Identification, anatomical position, articulations and attachments
AN53.2	Bony pelvis
AN53.3	Bones of abdominopelvic region
AN53.4	Clinical importance of bones of abdominopelvic region
54	**Radio diagnosis**
AN54.1	KUB plain X-ray abdomen
AN54.2	(contrast X-ray Barium swallow, Barium meal, Barium enema,) Cholecystography, intravenous pyelography and Hysterosalpingography
AN54.3	ERCP, CT abdomen, MRI Arteriography in radio diagnosis of abdomen
55	**Surface marking**
AN55.1	Surface projections of regions and planes of the abdomen, superficial inguinal ring, deep inguinal ring, McBurney's point, renal angle and Murphy's point
AN55.2	Surface marking of the stomach, Liver, Fundus of the gall bladder, Spleen, Duodenum, Pancreas, ileocaecal junction, Kidneys and Root of the mesentery
56	**Meninges and CSF**
AN56.1	Various layers of meninges with their extent and modifications
AN56.2	Formation and circulation of CSF with its applied anatomy
57	**Spinal Cord**
AN57.1	External features of the spinal cord
AN57.2	The extent of the spinal cord in children and adults with its clinical implication
AN57.3	Transverse section of the spinal cord at the mid-cervical and midthoracic level
AN57.4	Ascending and descending tracts at the mid-thoracic level of the spinal cord
AN57.5	Describe the anatomical basis of syringomyelia

Competency No.	Topics and Subtopics
58	**Medulla Oblongata**
AN58.1	External features of the medulla oblongata
AN58.2	Transverse section of the medulla oblongata at the level of 1) pyramidal decussation 2) sensory decussation 3) Inferior Olivary Nucleus
AN58.3	Cranial nerve nuclei in medulla oblongata with their functional group
AN58.4	Anatomical basis and effects of medial and lateral medullary Syndrome
59	**Pons**
AN59.1	External features of the Pons
AN59.2	Transverse section of pons at the upper and lower level
AN59.3	Cranial nerve nuclei in pons with their functional group
60	**Cerebellum**
AN60.1	External and internal features of the cerebellum
AN60.2	Connections of cerebellar cortex and intracerebellar nuclei
AN60.3	Anatomical basis of cerebellar dysfunction
61	**Midbrain**
AN61.1	External and Internal features of the midbrain
AN61.2	Internal features of the midbrain at the level of superior and inferior colliculus
AN61.3	Anatomical basis and effects of Benedikt's and Weber's syndrome
62	**Cranial nerve nuclei and cerebral hemispheres**
AN62.1	Cranial nerve nuclei with its functional component
AN62.2	Surfaces, sulci, gyri, poles and functional areas of the cerebral hemisphere
AN62.3	The white matter of the cerebrum
AN62.4	Parts and major connections of basal ganglia and limbic lobe
AN62.5	Boundaries, parts, gross relation, major nuclei, and connections of dorsal thalamus, hypothalamus, epithalamus, metathalamus, and subthalamus
AN62.6	Formation, branches and major areas of distribution of the circle of Willis
63	**Ventricular System**
AN63.1	Parts, boundaries and features of 3rd, 4th and lateral ventricle
AN63.2	Describe the anatomical basis of congenital hydrocephalus
64	**Histology and Embryology**
AN64.1	Microanatomical features of the spinal cord, cerebellum and cerebrum
AN64.2	Development of neural tube, spinal cord, medulla oblongata, pons, midbrain, cerebral hemisphere and cerebellum
AN64.3	Various types of open neural tube defects with their embryological basis
65	**Epithelium histology**

Competency No.	Topics and Subtopics
AN65.1	Types of epithelium under the microscope and describe the various types that correlate to its function
AN65.2	Ultrastructure of epithelium
66	**Connective tissue histology**
AN66.1	Various types of connective tissue with functional correlation
AN66.2	Ultrastructure of connective tissue
67	**Muscle histology**
AN67.1	Various types of muscle under the microscope
AN67.2	Classification of various types of muscle and describe the structure-function correlation of the same
AN67.3	Ultrastructure of muscular tissue Nervous tissue histology
AN68.1	Multipolar and unipolar neurons, ganglia, peripheral nerve
AN68.2	Structure-function correlation of neuron
AN68.3	Ultrastructure of nervous tissue
69	**Blood Vessels**
AN69.1	Elastic and muscular blood vessels, and capillaries under the microscope
AN69.2	Various types and structure-function correlation of blood vessel
AN69.3	Describe the ultrastructure of blood vessels
70	**Glands and Lymphoid tissue**
AN70.1	Various exocrine glands under the microscope and distinguish between serous, mucous, and mixed acini
AN70.2	Identify the lymphoid tissue under the microscope and describe microanatomy of lymph, node, spleen, thymus, and tonsil and correlate the structure with function
71	**Bone and Cartilage**
AN71.1	Bones under the microscope classify various types and describe the structure – Function correlation of the same
AN71.2	Structure of cartilage under the microscope and describe various types and structure-function correlation of the same.
72	**Integumentary System**
AN72.3	Skin and its appendages under the microscope and correlate the structure with function.
73	**Chromosomes**
AN73.1	Structure of chromosomes with classification
AN73.2	Technique of karyotyping with its applications
AN73.3	Lyon's hypothesis
74	**Patterns of inheritance**
AN74.1	Various modes of inheritance with examples

Competency No.	Topics and Subtopics
AN74.2	Pedigree charts for the various types of inheritance and give examples of diseases of each mode of inheritance
AN74.3	Multifactorial inheritance with examples
AN74.4	Genetic basis and clinical features of Achondroplasia, Cystic Fibrosis, Vitamin D resistant rickets, Haemophilia, Duchene's muscular dystrophy and sickle cell anaemia
75	**Principle of Genetics, Chromosomal Aberrations, and Clinical Genetics**
AN75.1	Structural and numerical chromosomal aberrations
AN75.2	Mosaics and chimeras with example
AN75.3	Genetic basis and clinical features of Prader-Willi syndrome, Edward syndrome, and Patau syndrome
AN75.4	Genetic basis of variation: polymorphism and mutation
AN75.5	Principles of genetic counselling
76	**Introduction to embryology**
AN76.1	Stages of human life
AN76.2	Phylogeny, Ontogeny, Trimester, Viability
77	**Gametogenesis and fertilization**
AN77.1	Uterine changes occurring during the menstrual cycle
AN77.2	Synchrony between the ovarian and menstrual cycles
AN77.3	Spermatogenesis and oogenesis along with diagrams
AN77.4	Stages and consequences of fertilization
AN77.5	Anatomical principles underlying contraception
AN77.6	Teratogenic influences, Fertility and sterility, surrogate motherhood, social significance of "sex-ratio".
78	**Second week of development**
AN78.1	Cleavage and formation of blastocyst
AN78.2	Development of trophoblast
AN78.3	Process of implantation and common abnormal sites of implantation
AN78.4	Formation of extra–embryonic mesoderm and coelom, bilaminar disc and prochordal plate
AN78.5	Abortion, decidual reaction, pregnancy test
79	**3rd to 8th week of development**
AN79.1	Formation and fate of the primitive streak
AN79.2	Development of trophoblast, fate of Notochord
AN79.3	Process of neurulation
AN79.4	Describe the development of somites and intra-embryonic coelom

Competency No.	Topics and Subtopics
AN79.5	Embryological basis of congenital malformations, nucleus pulposus, sacrococcygeal teratomas, neural tube defects
AN79.6	Describe the diagnosis of pregnancy in the first trimester and the role of teratogens, alpha-fetoprotein
80	**Foetal membranes**
AN80.1	Formation, functions and fate of chorion; amnion; yolk sac; allantois and decidua
AN80.2	Formation and structure of umbilical cord
AN80.3	Formation of the placenta, its physiological functions, fetomaternal circulation and placental barrier
AN80.4	Embryological basis of twinning in monozygotic and dizygotic twins
AN80.5	Role of placental hormones in uterine growth and parturition
AN80.6	Embryological basis of estimation of foetal age.
AN80.7	Various types of umbilical cord attachments
81	**Prenatal Diagnosis**
AN81.1	Various methods of prenatal diagnosis
AN81.2	Indications, process and disadvantages of amniocentesis
AN81.3	Indications, process and disadvantages of chorion villus biopsy
82	**Ethics in anatomy**
AN82.1	Respect and follow the corrected procedure when handling cadavers and other biological tissue

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.

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 the MBBS programme and provide them with the requisite knowledge, communication (including electronic), and technical and language skills.

1. 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 1st of August of each year from the academic year 2024-25. There shall be no admission of students in respect of any academic session beyond 30th August from academic year 2024-25. 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 the 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 the National Medical Commission.

Every learner shall undergo a period of certified study extending over four and a half academic years, divided into four professional years from the date of commencement of the 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 a lunch break.

Didactic lectures shall not exceed one-third of the schedule; two-thirds of the schedule shall include interactive sessions and practical, clinical, and/or group discussions. The learning

process should include clinical experiences, problem-oriented approaches, case studies, and community health care activities.

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

At the end of each professional year university examination will be conducted. If any student fails to clear the university examination, he will appear in a 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 the supplementary examination of the first MBBS, he shall join the batch of the 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 the second professional examination.
- A candidate who fails the third Professional (Part I) examination shall be allowed to join the third Professional Part 11 training, however, he shall not be allowed to appear for the examination unless he has passed the second professional examination.

II The period of 4 and 1/2 years is divided as follows: Phase 1 - Total 12 months

i) Phase I - First Professional phase of 12 months including Foundation Course of one week and university exams. it shall consist of — Anatomy, Physiology, Biochemistry, Introduction to Community Medicine, Humanities, Professional development including Attitude, Ethics and Communication (AETCOM) module, family adoption programme through village outreach where each student shall adopt a minimum of three (03) families and preferably at least five (05) families, Pandemic module and early clinical exposure, ensuring alignment and all types of integration and simulation-based learning.

ii) Phase II- Second Professional (12 months) including university exams. It will consist of Pathology, Pharmacology, Microbiology, family visits under Community Medicine, General Surgery, General Medicine and Obstetrics and Gynaecology Professional development including the AETCOM module, simulation-based learning and introduction to clinical subjects ensuring both alignment and all types of integration.

The clinical exposure to learners will be in the form of the 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:

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

iii) Phase III - 30 months

a. Third Professional Part 1 (12 months, including University exams)

Forensic Medicine and Toxicology, Community Medicine, Medicine and allied, Surgery and allied, Paediatrics and Obstetrics and Gynaecology including AETCOM, Pandemic module, Clinical teaching in General Medicine, General Surgery, Obstetrics and Gynaecology, Paediatrics, Orthopaedics, Dermatology, Community Medicine, Psychiatry, Respiratory Medicine, Radio-diagnosis (and Radiotherapy) and Anaesthesiology and Professional development.

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

c, Third Professional Part II (18 months, including University exam)-

Subjects include:

1. Medicine and allied specialties (General Medicine, Psychiatry, Dermatology, Venereology and Leprosy (DVL), Respiratory Medicine including Tuberculosis)
2. Surgery and allied specialties (General Surgery, Otorhinolaryngology, Ophthalmology, Orthopaedics, Dentistry, Physical Medicine and rehabilitation, Anaesthesiology and Radio diagnosis)

3. Obstetrics and Gynaecology (including Family Welfare)

4. Paediatrics

5. AETCOM module

III. Distribution of teaching hours phase-wise

a. First, Second and Third Professional part-I, teaching hours:

Time allotted: 12 months (approx. 52weeks)

Time available: Approx. 39 weeks (excluding 3 weeks) (39 hours/ week)

Prelim, University Exam and Results: 9 weeks

Vacation: 2 weeks

Public Holidays: 2 weeks

Time distribution in weeks: 39 weeks x 39 hours = 1521 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 and Results: 10 weeks

Vacation: 3 weeks

Public Holidays: 3 weeks

Time distribution in weeks: 62 x 39 hrs. = 2418 hrs. Available for Teaching- Learning **(Clinical Postings: 15 hours/week II MBBS onwards included in academic schedule)** these are attached in separate 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 part 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 the university examination period.
- An exposure to skills lab for at least two (02) weeks before clinical postings shall be made available to all students.

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 the 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

(e) Train the learner to provide:

- First-aid
- Basic life support
- In addition to the above, learners may enroll 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 to 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 the supervision of the Heads of MBBS phase I 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 the experience of patients as a motivation to learn,
- Recognize attitude, ethics and professionalism as integral to the 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, and 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 at 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 healthcare 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 to further his professional and personal growth.

Learning experiences:

- This will be a longitudinal programme spread across the continuum of the MBBS programme including internships,
- Learning experiences shall include small group discussions, patient care scenarios, workshops, seminars, role plays, lectures etc.
- The Attitude, Ethics and Communication Module (AETCOM module) developed by the erstwhile Medical Council of India should be used longitudinally for purposes of instruction.
- 75% attendance in the 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 speciality 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 settings.

b. Structure:

- The first clinical posting in the second professional shall orient learners to the patient, their roles and the speciality.
- The learner-doctor programme shall progress as outlined in Table 9.
- The learner shall function as a part of the healthcare 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 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 lease 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.

D) Assessment

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. Each student shall adopt minimum 3 families and preferably five families. The details shall be as per Family Adoption Program guidelines.
- 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 1 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/her to function effectively and appropriately as a physician of 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. 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, analyse 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 12th 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 (12th 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 1 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 17^{th} / 18^{th} month of that training, in the subjects of General Medicine, General Surgery, Ophthalmology, Otorhinolaryngology, Obstetrics and Gynaecology, and Paediatrics, 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 40% 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 aggregate and 60:40 (minimum) or 40:60 (minimum) 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.

As per CORRIGENDUM F. No. U/14021/8/2023-UGMEB Dated 1st September 2023 by NMC UGMEB.

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 following MBBS, 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 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.
- The Examiners for General Surgery and allied subjects as well as for General Medicine and allied subjects, shall be from General Surgery and General Medicine respectively.
- There shall be no grace marks to be considered for passing in an examination.

AETCOM COMPETENCIES

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 she/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

Table1: Time distribution of MBBS Programme and Examination Schedule Proposed Academic Calendar for CM 2023-24 Batch 2023

Month	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2023									1	2	3	4
2024	5	6	7	8	9	10	11	12 1st Prof Exam Result	13 2nd MBBS	14	15	16
2025	17	18	19	20	21	22	23	24 2nd Prof Exam Result	25 Final 1st	26	27	28
2026	29	30	31	32	33	34	35	36 Final 1st Exam Result	37 Final2nd MBBS	38	39	40
2027	41	42	43	44	45	46	47	48	49	50	51	52
2028	53	54	1. CRMI	2	3	4	5. 2nd Proposed NEXT	6	7	8	9	10
2029	11	12 NEXT Step-2										

Legends:

AETCOM: Attitude, Ethics and Communication skills

FAQ': Family Adoption Programme (village outreach)

SDL: Self Directed Learning

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

PCT (mentioned in Assessments): Part Completion Test

Table 2: Distribution of subjects in each Professional Phase

Phase and year of MBBS training	Subjects and 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 and Biochemistry, Introduction to Community Medicine, including Family adoption programme (FAP) through village outreach III. Early Clinical Exposure IV. Attitude, Ethics, and communication Module (AETCOM) including Humanities	12 months	1st professional
Second Professional MBBS	I. Pathology, Microbiology, Pharmacology II. Introduction to clinical subjects III. Clinical postings, Family visits for FAP IV. AETCOM	12 months	2nd professional .
Third Professional part 1, MBBS, including Electives 1 month	I. Community Medicine, Forensic Medicine and Toxicology, Medicine and allied, Surgery and allied, Paediatrics, Obstetrics and Gynaecology 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, Paediatrics, General Surgery, Orthopaedics, Otorhinolaryngology, Ophthalmology, Radio diagnosis, Anaesthesiology, Obstetrics and Gynaecology II. Clinical postings III. AETCOM al - Part II	18 months	Final Profession-

Table 3: Foundation Course

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

Subjects/Contents	Teaching hours
Orientation	30
Skills Module	34
Field visit to Community Health Centre	8
Introduction to Professional Development and AETCOM module	40
Sports, Yoga and extra-curricular activities	16
Enhancement of language/computer skills	32
Total	**160**

Table no. 4 Distribution of Subject Wise Teaching Hours for 1st 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	-	0	27
Community Medicine	20	20	-	40
FAP	-	-	7	27
(AETCOM)***	-	26	-	26
Sports and extra-curricular activities	-	-	-	10
Formative Assessment and Term examinations	-	-	-	60
Total	**464**	**918**	**30**	**1521 #**

*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 10 Marks distribution for various subjects for University Annual Examinations

Phase of Course	Theory	Practical	Passing criteria
1st MBBS			
Anatomy- 2 papers	Paper 1- 100	100	Mandatory to get 40% marks separately in theory and in practical; and totally 50% for theory plus Practical.
	Paper 2 -100		
Physiology-papers	Paper 1- 100	100	
	Paper 2 -100		
Biochemistry- 2 papers	Paper 1- 100	100	
	Paper 2- 100		
2nd MBBS			
Pathology - 2 papers	Paper 1- 100	100	
	Paper 2 -100		
Microbiology- 2 papers	Paper 1- 100	100	
	Paper 2- 100		
Pharmacology- 2 papers	Paper 1 -100	100	
	Paper 2- 100		
Final MBBS part 1			
Forensic Med. Tox.- 1 paper	Paper I - 100	50	
Community Med- 2 papers	Paper I -100	100	
	Paper 2- 100		

For NEXT, as per NEXT regulations.

Internal Assessment

Theory

Department of Anatomy/ Physiology/ Biochemistry

Department of Anatomy/Physiology /Biochemistry											
Facility : MBBS I		Year/Phase- I								Date : dd/mm/yyyy	
		Formative Assessment Theory				Continuous Internal Assessment Theory					
Roll No	Name of Students	1st PCT Theory	2nd PCT Theory	Prelim Theory (Paper I & II)	Home Assignment	Continuous Class Test (CMS)	Seminar	Museum	Library assignments	Attendance Theory	Total
							Self-Directed Learning				
		100	100	200	15	30	15	15	15	10	500
Professor & Head Department of Name of Institute											

Practical

Department of Anatomy/Physiology /Biochemistry												
Facility : MBBS I			Year/Phase- I								Date : dd/mm/yyyy	
			Formative Assessment Theory			Continuous Internal :Assessment (Practical)				Journal Record Book portfolio	Attendance Practical	Total
Sr. No.	Roll. No.	Name of Student	1st PCT Practical/First Ward Laving Examination	2nd PCT Practical/First Ward Laving Examination	Prelim Practical	Certifiable skill based Competencies (Through OSPE/OSCE/ Spots/Exercise/Other)	AETCOM competencies	SVL Lab Activity	Research			
			100	100	100	60	30	40	20	40	10	500
Professor & Head Department of Name of Institute												

Practical Mark's Structure

Internal Assessment Examinations I, II and Preliminary

Applicable for batch admitted in M.B.B.S Course from Academic Year 2023-24 & onwards

Anatomy Practical										
Seat No.	Soft Part	Micro Anatomy (10 Spots)	Micro Anatomy slides for Discussion (2 slides)	Clinical Anatomy Including Genetic charts (2 Spots)	Embryology Models	Axial Skeleton	Appendicular Skeleton	Radiological Anatomy	Surface Living Anatomy	Total
	A	B	C	D	E	F	G	H	I	K
Max. Marks	30	10	10	10	10	10	10	05	05	100

QUESTION PAPER PATTERN FOR I MBBS (CBME) University Examination October/November 2023 Onwards

Anatomy Paper-I

Paper	Topics
I (Above Clavicle)	Gross Anatomy of Superior extremity
	Gross Anatomy of Head , Neck and Face
	Gross Anatomy of Neuroanatomy
	General Embryology
	Genetics
	Systemic Histology and Embryology of Related above Topics of Paper I

Anatomy Paper-II

Paper	Topics
II (Below Clavicle)	General Anatomy
	General Histology
	Gross Anatomy of Thorax
	Gross Anatomy of Abdomen and Pelvis
	Gross Anatomy of Inferior extremity
	Systemic Histology and Embryology of Related above Topics of Paper II

- Scenario based / application questions can be on any topic of the Respective paper I & II
- For long answer question and scenario based / Clinical application questions, region will not be repeated

Anatomy Paper-I & Paper-II (100 Marks Each)

Section	Question No	Type of Questions	No of Question × Marks	Total Marks
A	1	MCQ (4 MCQs must be Scenario Based)	10 × 2	20
B	2	Brief Answer Questions (BAQs)	5 × 2	10
	3	Short Answer Questions (SAQs) (4 out of 5) (2 SAQs must be Clinical Application Based)	4 × 5	20
	4	Long Answer Questions (LAQs) (1 out of 2)	1 × 10	10
C	5	Brief Answer Questions (BAQs)	5 × 2	10
	6	Short Answer Questions (SAQs) (4 out of 5)	4 × 5	20
	7	Long Answer Questions (LAQs) (1 out of 2)	1 × 10	10
			Total	**100**

Recommended text and referral books

1) Gray's Anatomy
2) Textbook of Anatomy by Vishram Singh Vol 1-4 (Fourth Edition)
3) B D Chaurasia's Human Anatomy 3 volumes (Ninth Edition)
4) Cunningham's manual of Practical Anatomy by Rachel Koshi 16th Edition Vol 1-3
5) Regional Anatomy by R. J. Last
6) Human Histology by Inderbir Singh
7) Atlas of Human Histology- DIFORE
8) Surgical Anatomy- McGregor
9) Histology- by Ham,
10) Human Embryology – Inderbir Singh/ Vishram Singh
11) Medical Embryology – Langman,
12) Surface Anatomy & Radiology – Halim Das,
13) General Anatomy by – B D Chaurasia / Vishram Singh
14) Text book of Neuroanatomy – Inderbir Singh/ Vishram Singh
15) Central Nervous System – Podar Bhagat
16) Clinical anatomy for medical students – Richard Snell
17) J.S.P. Lumbley at all – M.C.Q's in Anatomy
18) Text Book of General Anatomy – V. Subhadra Devi
19) Clinical Anatomy by-Neeta V Kulkarni.

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