MGM INSTITUTE OF HEALTH SCIENCES

(Deemed University u/s 3 of UGC Act, 1956)
Grade 'A' Accredited by NAAC
Sector-01, Kamothe, Navi Mumbai - 410 209
Tel 022-27432471, 022-27432994, Fax 022 - 27431094
E-mail : registrar@mgmuhs.com ; Website : www.mgmuhs.com

Syllabus for

MBBS – (First Year)

Approved as per BOM. 04/2007, dated 14.12.2007, item 4 & amended up to BOM. 43/2015 dated ~~14.11.2015~~

Syllabus have been categorized as **'Must know'** (70%), **'Desirable to Know'** (30%) and **'Nice to Know'** (10%) topics.

Inside this booklet, **'Desirable to know'** & **'Nice to Know'** topics are stamped and remaining all unstamped topics belong to **'Must Know'** area.

Prof. Z. G. Badade
Registrar
MGM Institute of Health Sciences
Kamothe, Navi Mumbai-401209

INDEX

Sr. No	Item	Page No.
1.	General Considerations and Teaching Approach	1-3
2.	Objective of Medical Graduate Training Programme	4-8
3.	Human Anatomy Syllabus	9-39
4.	Human Physiology Syllabus	40-65
5.	Human Biochemistry Syllabus	66-73
6.	Rules & Regulations of Examination for the Subject of First Year MBBS Course of MGM Institute of Health Sciences, Navi Mumbai	74-80

GENERAL CONSIDERATIONS AND TEACHING APPROACH

(1) Graduate medical curriculum is oriented towards training students to undertake the responsibilities of a physician of first contact who is capable of looking after the preventive, promotive, curative & rehabilitative aspect of medicine.

(2) With wide range of career opportunities available today, a graduate has a wide choice of career opportunities. The training, though broad based and flexible should aim to provide an educational experience of the essentials required for health care in our country.

"Training should be able to meet internationally acceptable standards."

(3) To undertake the responsibilities of service situations which is a changing condition and of various types, it is essential to provide adequate placement training tailored to the needs of such services as to enable the graduates to become effective instruments of implementation of those requirements. To avail of opportunities and be able to conduct professional requirements, the graduate shall endeavour to have acquired basic training in different aspects of medical care.

(4) The importance of the community aspects of health care and of rural health care services is to be recognized. This aspect of education & training of graduates should be adequately recognized in the prescribed curriculum. Its importance has been systematically upgraded over the past years and adequate exposure to such experiences should be available throughout all the three phases of education & training. This has to be further emphasized and intensified by providing exposure to field practice areas and training during the internship period. The aim of the period of rural training during internship is to enable the fresh graduates to function efficiently under such settings.

(5) The educational experience should emphasize health and community orientation instead of only disease and hospital orientation or being concentrated – on - curative - aspects. As such all the basic concepts of modern scientific medical education are to be adequately dealt with.

(6) There must be enough experiences to be provided for self learning. The methods and techniques that would ensure this must become a part of teaching - learning process.

(7) The medical graduate of modern scientific medicine shall endeavour to become capable of functioning independently in both urban and rural environment. He/she shall endeavour to give emphasis on fundamental aspects of the subjects taught and on common problems of health and disease avoiding unnecessary details of specialization.

(8) The importance of social factors in relation to the problem of health and diseases should receive proper emphasis throughout the course and to achieve this purpose, the educational process should also be community based than only hospital based. The

importance of population control and family welfare planning should be emphasized throughout the period of training with the importance of health and development duly emphasized.

(9) Adequate emphasis is to be placed on cultivating logical and scientific habits of thought, clarity of expression and independence of judgment, ability to collect and analyze information and to correlate them.

(10) The educational process should be placed in a historic background as an evolving process and not merely as an acquisition of a large number of disjointed facts without a proper perspective. The history of Medicine with reference to the evolution of medical knowledge both in this country and the rest of the world should form a part of this process.

(11) Lectures alone are generally not adequate as a method of training and are a poor means of transferring/acquiring information and even less effective at skill development and in generating the appropriate attitudes. Every effort should be made to encourage the use of active methods related to demonstration and on firsthand experience. Students will be encouraged to learn in small groups, through peer interactions so as to gain maximal experience through contacts with patients and the communities in which they live. While the curriculum objectives often refer to areas of knowledge or science, they are best taught in a setting of clinical relevance and hands on experience for students who assimilate and make this knowledge a part of their own working skills.

(12) The graduate medical education in clinical subjects should be based primarily on out-patient teaching, emergency departments and within the community including peripheral health care institutions. The out-patient departments should be suitably planned to provide training to graduates in small groups.

(13) Clinics should be organized in small groups of preferably not more than 10 students so that a teacher can give personal attention to each student with a view to improve his skill and competence in handling of the patients.

(14) Proper records of the work should be maintained which will form the basis for the students' internal assessment and should be available to the inspectors at the time of inspection of the college by the Medical Council of India.

(15) Maximal efforts have to be made to encourage integrated teaching between traditional subject areas using a problem based learning approach starting with clinical or community cases and exploring the relevance of various preclinical disciplines in both understanding and resolution of the problem. Every attempt be made to de-emphasize compartmentalization of disciplines so as to achieve both horizontal and vertical integration in different phases.

(16) Every attempt is to be made to encourage students to participate in group discussions and seminars to enable them to develop personality, character, expression and other faculties which are necessary for a medical graduate to function either in solo practice or as a team leader when he begins his independent career. A discussion group should not have more than 20 students.

(17) Faculty member should avail of modern educational technology while teaching the students and to attain this objective, Medical Education Units/ Departments be established in all medical colleges for faculty development and providing learning resource material to teachers.

(18) To derive maximum advantage out of this revised curriculum, the vacation period to students in one calendar year should not exceed one month, during the 4 ½ years Bachelor of Medicine and Bachelor of Surgery (MBBS) Course.

(19) In order to implement the revised curriculum in Toto, State Govts. and Institution Bodies must ensure that adequate financial and technical inputs are provided.

(20) HISTORY OF MEDICINE –The students will be given an outline on "History of Medicine". This will be taught in an integrated manner by subject specialists and will be coordinated by the Medical Education Unit of the College.

(21) All medical institutions should have curriculum committee which would plan curricula and instructional method which will be regularly updated.

(22) Integration of ICT in learning process will be implemented.

OBJECTIVE OF MEDICAL GRADUATE TRAINING PROGRAMME:

(1) **NATIONAL GOALS** : At the end of undergraduate program, the medical student 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/her social obligations towards realization of this goal.

(b) Learn every aspect of National policies on health and devote himself / herself 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 observation of medical ethics and fulfilling social and professional obligations, so as to respond to national aspirations.

(2) **INSTITUTIONAL GOALS**: (1) In consonance with the goals each medical institution should evolve institutional goals to define the manpower (or professionals) they intend to produce. The undergraduate students 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 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) Be able to 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 Programmes including practical aspects of the following:-

(i) Family Welfare and Material and Child Health(MCH)

(ii) Sanitation and water supply

(iii) Prevention and control of communicable and non-communicable diseases
(iv) Immunization
(v) Health Education
(vi) IPHS standard of health at various level of service delivery, medical waste disposal.
(vii) Organizational 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.

(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 such as personal integrity, sense of responsibility and dependability and ability to relate to or show concern for other individuals.

All efforts must be made to equip the medical graduate to acquire the skills as detailed under :

A comprehensive list of skills recommended as desirable for Bachelor of Medicine and Bachelor of Surgery (MBBS) Graduate:

1. **Clinical Evaluation**:

(a) To be able to take a proper and detailed history.
(b) To perform a complete and thorough physical examination and elicit clinical signs.
(c) To be able to properly use the stethoscope, Blood Pressure, Apparatus Auroscope, Thermometer, Nasal Speculum, Tongue Depressor, Weighing Scales, Vaginal Speculum etc.:
(d) To be able to perform internal examination-Per Rectum (PR), Per Vaginum (PV) etc.
(e) To arrive at a proper provisional clinical diagnosis.

II. **Bed side Diagnostic Tests**:

(a) To do and interpret Haemoglobin (HB), Total Count (TC), Erythrocytic Sedimentation Rate (ESR), Blood smear for parasites, Urine examination /albumin /sugar /ketones /microscopic:
(b) Stool exam for ova and cysts;
(c) Gram, staining and Siehl-Nielsen staining for AFB;
(d) To do skin smear for lepra bacilli
(e) To do and examine a wet film vaginal smear for Trichomonas
(f) To do a skin scraping and Potassium Hydroxide (KOH) stain for fungus infections;
(g) To perform and read Montoux Test.

III. **Ability to Carry Out Procedures**:

(a) To conduct CPR (Cardiopulmonary resuscitation) and First aid in newborns, children and adults.
(b) To give Subcutaneous (SC) /Intramuscular (IM) /Intravenous (IV) injections and start Intravenous (IV) infusions.
(c) To pass a Nasogastric tube and give gastric leavage.
(d) To administer oxygen-by masic/catheter
(e) To administer enema
(f) To pass a ruinary catheter-male and female
(g) To insert flatus tube
(h) To do pleural tap, Ascitic tap & lumbar puncture
(i) Insert intercostal tube to relieve tension pneumothorax
(j) To control external Haemorrhage.

IV Anaesthetic Procedure

(a) Administer local anaesthesia and nerve block
(b) Be able to secure airway potency, administer Oxygen by Ambu bag.

V **Surgical Procedures**

(a) To apply splints, bandages and Plaster of Paris (POP) slabs;
(b) To do incision and drainage of abscesses;
(c) To perform the management and suturing of superficial wounds;
(d) To carry on minor surgical procedures, e.g. excision of small cysts and nodules, circumcision, reduction of paraphimosis, debridement of wounds etc
(e) To perform vasectomy;
(f) To manage anal fissures and give injection for piles.

VI **Mechanical Procedures**

(a) To perform thorough antenatal examination and identify high risk pregnancies.
(b) To conduct a normal delivery;
(c) To apply low forceps and perform and suture episiotomies;
(d) To insert and remove IUD's and to perform tubectomy

VII **Paediatrics**

(a) To assess new borns and recognize abnormalities and I.U. retardation
(b) To perform Immunization;
(c) To teach infant feeding to mothers;
(d) To monitor growth by the use of 'road to health chart' and to recognize development retardation;
(e) To assess dehydration and prepare and administer Oral Rehydration Therapy (ORT)
(f) To recognize ARI clinically;

VIII **ENT Procedures**:

(a) To be able to remove foreign bodies;
(b) To perform nasal packing for epistaxis;
(c) To perform trachesotomy

IX **Ophthalmic Procedures**:

(a) To invert eye-lids;
(b) To give Subconjunctival injection;
(c) To perform appellation of eye-lashes;
(d) To measure the refractive error and advise correctional glasses;
(e) To perform nasolacrimal duct syringing for potency

X. **Dental Procedures**:

To perform dental extraction

XI **Community Healthy**:

(a) To be able to supervise and motivate, community and para-professionals for corporate efforts for the health care;
(b) To be able to carry on managerial responsibilities, e.g. Management of stores, indenting and stock keeping and accounting
(c) Planning and management of health camps;
(d) Implementation of national health programmes;
(e) To effect proper sanitation measures in the community, e.g. disposal of infected garbage, chlorination of drinking water;
(f) To identify and institute and institute control measures for epidemics including its proper data collecting and reporting.

XII **Forensic Medicine Including Toxicology**

(a) To be able to carry on proper medico legal examination and documentation of injury and age reports.
(b) To be able to conduct examination for sexual offences and intoxication;
(c) To be able to preserve relevant ancillary material for medico legal examination;
(d) To be able to identify important post-mortem findings in common un-natural deaths.

XIII **Management of Emergency**

(a) To manage acute anaphylactic shock;
(b) To manage peripheral vascular failure and shock;
(c) To manage acute pulmonary oedema and LVF;
(d) Emergency management of drowning, poisoning and seizures
(e) Emergency management of bronchial asthma and status asthmaticus;
(f) Emergency management of hyperpyrexia;
(g) Emergency management of comatose patients regarding airways, positioning prevention of aspiration and injuries
(h) Assess and administer emergency management of burns

Syllabus for
HUMAN ANATOMY

INDEX

Sr. No	Item	Page No.
1	**Broad Curriculum As Per MCI Guidelines for Human Anatomy**	11-12
2	**Syllabus of Human Anatomy**	13-39

BROAD CURRICULUM AS PER MCI GUIDELINES (HUMAN ANATOMY)

(a) Goal

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide a basis for understanding the clinical correlation of organs or structures involved and the anatomical basis for the disease presentations.

(b) **Objectives** :

A) **Knowledge** :

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

a. Comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body.

b. Identify the microscopic structure and correlate elementary ultra-structure of various organs and tissues and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.

c. Comprehend the basic structure and connections of the central nervous system to analyze the integrative and regulative functions and systems. He / She should be able to locate the site of gross lesions according to the deficits encountered.

d. 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/She should be able to explain the developmental basis of the major variations and abnormalities.

(B) **Skills**:

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

(a) Identify and locate all the structures of the body and mark the topography of the living anatomy.

(b) Identify the organs and tissues under the microscope.

(c) Understand the principles of karyotyping and identify the gross congenital anomalies.

(d) Understand principles of newer imaging techniques and interpretation of Computerized Tomography (CT) Scan, Sonogram etc.

(e) Understand clinical basis of some common clinical procedures i.e., intramuscular & intravenous injection, lumbar puncture and kidney biopsy etc.

(C) **Integration**

From the integrated teaching of other basic sciences, student should be able to comprehend the regulation and integration of the functions of the organs and systems in the body and thus interpret the anatomical basis of disease process.

SYLLABUS & TEACHING HOURS DISTIBUTION
(1ST Year MBBS)

		Topic	Lect	Demo	LD	Diss	Practical
1.	**GENERAL ANATOMY**						--
		Introduction to Anatomy	1				
		Terminology			1		
		Bone	1	1		3	
		Joints	2				
		Skin & fascia	1				
		Muscle	1				
		Circulatory System	1				
		Nervous System	1				
		Lymphatic System	1				
2.	**UPPER LIMB**	**Region** Back	1			28.5	-
		Scapular region			1		
		Pectoral region			1		
		Mammary Gland	1				
		Axilla	1				
		Arm i. Back			1		
		ii. Front					
		Cubital fossa		1			
		Fore arm i. Front			1		
		ii. Back			1		
		Palm					
		Anatomical Snuff box		1			
		Palmar. Spaces		1			
		Bones Scapula		1		-	-
		Clavicle		1			
		Humerus		1			
		Radius		1			
		Ulna		1			
		Articulated hand		1			
		Muscles Intrinsic muscles of Hand			1	3	-

		Nerves	Brachial plexus	1			3	
			Radial nerve	1				
			Median nerve	1				
			Ulnar nerve	1				
			Axillary nerve			1		
		Vessels	Axillary Artery			1		-
			Anastamosis around scapula			1		
			Palmar arches			1	1.5	
		Joints	Shoulder	1			3	-
			Elbow	1				
			Wrist & 1st CMC	1				
			Radioulnar	1				
		Revision					6	
3.	**LOWER LIMB**	**Region**	Front of thigh			1	33	-
			Femoral Triangle	1				
			Femoral Sheath		1			
			Gluteal region	1				
			Adductor canal			1		
			Popliteal fossa		1	1		
			Back of thigh			1		
			Leg			2		
		Bones	Hip bone		2		-	-
			Femur		2			
			Tibia/fibula		2			
			Patella					
			Articulated foot with Talus & calcanium		1			
		Muscles	Layers of sole			1	3	
		Nerves	Femoral & Obturator nerve					
			Sciatic Nerve	1		1		
		Vessels	Femoral Artery				3	-
			Popliteal Artery					
			Vessels of Leg & sole			1		

			Venous Drainage of Lower limb	1				
		Joint	Hip	1			3	
			Knee	1				
			Ankle	1				
			Subtalar Joint. Inversion& Eversion	1				
			Arches of foot	1				
		Revision					9	
4	**THORAX**	**Bones**	Sternum		1		-	-
			Rib		1			
			Thoracic Vertebra		2			
		Thoracic cage	Intercostal space	1		1	19.5	-
			Mechanism & movement of respiration	1				
			Pleura	1				
			Lung & Bronchopulmonary segments	1	2			
			Pericardium	1				
			Coronary circulation	1				
			Heart –External & Internal features		2			
			Division of mediastinum and superior mediastinum					
				1				
			Posterior Mediastinum			1		
			Diaphragm	1				
		Vessels	Azygous system	1				
		Revision					4.5	
5.	**ABDOMEN & PELVIS**	**Bones**	Pelvis		2		-	-
			Lumber vertebra		1			
			Sacrum		1			

			Anterior Abdominal wall Rectus sheath	1			10.5	-
			Inguinal canal	1				
			Testis and spermatic cord	1				
			Peritoneum	2				
		Organs	Liver		1		19.5	
			Extrahepatic biliary apparatus	1				
			Portal Vein and Portocaval anastamosis	1				
			Stomach	1	1			
			Duodenum	1	1			
			Small & Large intestines		1	1		
			Posterior abdominal wall			1		
			Abdominal aorta			1		
			Anal canal	1				
			Rectum			1		
			Pancreas	1	1			
			Spleen			1		
			Kidney	1	1			
			Supra renal			1		
			Ureter					
			Prostate		1			
			Uterus	1				
			Fallopian tube, Ovary and Uterus		1			
			Urinary bladder	1	1			
		Pelvis	Perineal pouches	1			10.5	
			Ischiorectal fossa	1				
			Male urethra	1				
			Pelvic diagram	1				
		Revision					9	

6.	**NEURO ANATOMY**		Spinal cord	2				
			Lumber vertebra		1			
			Medulla	1			1.5	
			Pons	1				
			Cerebellum	1		1		
			CSF circulation			1		
			4th Ventricle	1		1		
			Mid brain	1	1			
			Cerebrum					
			Surfaces & borders		1		4.5	
			Sulci & gyri	1				
			Functional area	1				
			Blood supply	1		1		
			White matter of cerebrum & Corpus callosum	1		1	1.5	
			Internal capsule	1	1		1.5	
			Gray matter					
			Basal ganglion	1				
			Lateral Ventricle	1	1			
			Thalamus	1			1.5	
			3rd Ventricle	1				
			Blood supply & Circle of willis	1		1	1.5	
			CSF circulation & cisterns			1		
			Limbic System	1				
			Reticular formation	-				
			Autonomic nervous system	1				
		Meninges	Layers & folds			1	1.5	
			Dural Venous sinuses	2				
		Revision					7.5	
7	**HEAD FACE & NECK**	**Bones**	Normas		2			
			Mandible		1			
			Cervical Vertebra		1			
			Cranial fossa		2			
			Foetal skull		1			
			Scalp	1				

			Face	1		1		
			Neck	2		1		
			Midline structure					
			Deep cervical fascia	1				
		Muscle				2		
		Nerves	Introduction to functional components	1			46.5	
			III, IV, VI	1				
			VII	1				
			IX	1				
			XI			1		
			XII	1				
			X	1				
		Vessels	Common carotid & External carotid arteries			1		
			Jugular veins			1		
			Subclavian artery			1		
			Maxillary artery			1		
		Glands	Parotid	1	1			
			Thyroid	1	1			
			Submandibular & Sublingual	1				
			Pituitary	1				
			Infratemporal fossa					
			Muscles of Mastication		1			
			Introduction to Vth cranial nerve & Mandibular Nerve	1		1		
			Parasympathetic ganglion			2		
			Pterygoid plexus of veins			1		
			Temporomandibular joint	1				
			Tongue	1				
			Pharynx	1	1			

			Larynx	2				
			Orbit and extra ocular muscles	1				
			Nasal cavity	1				
			Ear			1		
			Middle ear	1				
			Tympanic membrane & auditory tube	1		1		
			Movements of eye		1			
			Palate	1				
			Tonsil					
			Paranasal air sinuses			1		
		Revision					12	
8	**HISTOLOGY**	**General Histo**	Microscope	1				2
			Cells & organelles	1				2
			Epithelium	1				2
			Connective Tissue	1				2
			Cartilage	1				2
			Bones	1				2
			Muscle	1				2
			Nervous System	1				2
			Blood vessels	1				2
			Lymphoid System	2				4
			Skin	1				2
		Revision						10
		Systemic Histo	Tongue & Salivary gland	1				
			Oesophagus & stomach	1				2
			Small & Large intestines & appendix	1				2
			Accessory organs of digestive system	1				
			Respiratory System	1				2
			Urinary system	1				2
			Male reproductive system	1				2
			Female reproductive	2				2

			system					
			Endocrines	1				4
			Nervous system	1				2
			Eye- retina & cornea	1				2
								2
		Revision	Cell division	1				15
9.	**EMBRYOLOGY**	**Gen Emb**	Spermatogenesis	1				
			Oogenesis & follicular devp	1				1
			Menstrual Cycle	1				
			Fertilization	1				1
			1st Wk of devp	1				1
			2nd Wk of Devp	1				
			3rd wk ofDevp	2				1
			4th wk of Devp					
			Folding of embryo	1				
			Derivatives of germ layer	2				1
			Choriinic villi					1
			Placenta	2				
								1
		Revision						4
		Systemic Emb	Primordial gut and its derivatives	1				
			Rotation of stomach & duodenum	1				
			Rotation of Gut	1				1
			Development of pancreas & Liver	1				1
			Development of Anal canal	1				1
			Cardiovascular system	3				1
			Urogenital system	2				2
			Respiratory system	1				2
			Pharyngeal Arch	1				
			Pouches, thyroid development	1				1
			Face	1				
			Palate	1				1

			Nervous system	3				1
			Skeletal system	1				
			Revision					
			Revision					6
10	**GENETICS**		Karyotyping	1				
			Chromosomal abnormalities and syndromes	5		1		
11	**RADIOLOGY**		Principles of Radiology	1		-	-	-
			Upper limb		1			
			Lower limb		1			
			Thorax		1			
			Abdomen		1			
			Pelvis					
			Head face and neck		1			
			Neuroanatomy		1			
					1			
		Revision			5			
12	**LIVING ANATOMY**		Movements of joints		1	-	-	-
			Upper limb		1			
			Lower Limb		1			
			Thorax		1			
			Abdomen and Pelvis		1			
			Head face and neck		1			
		Revision			5			

	THEORY		PRACTICAL			
	Lecture	**Lecture cum Demo**	**Demonstration**	**Dissection**	**Histology practicals**	**Embryology practicals**
TEACHING HOURS	167	53	78	252	71	29
TOTAL	**220**			**430**		

Horizontal Integration: Is done in collaboration with physiology and biochemistry departments on clinically relevant topics during the course.

DEPARTMENT OF ANATOMY
M. G. M. Institute of Health Sciences, Navi Mumbai

SYLLABUS

I General Anatomy

Introduction to Anatomy

Tissues of body (Organization)

Terminology

Bone

Joints

Skin and Fascia

Muscle

Circulatory System

Nervous System

Lymphatic System

Introduction of imaging techniques.

Must Know:

1. Bone – Classification, Sesamoid bone, Parts of a growing long bone blood supply of long bone. Parts of long bone, ossification and its classification; epiphysis and its types. Laws of ossification.

2. Tissues of body: organization of tissue; types of tissues and organization of organ systems with systemic organization.

2. Joints – Classification

Fibrous joints, cartilaginous joints, Synovial joints – Classification

3. Skin and fascia

~~Structure and Functions of Skin~~

~~Thick skin, thin skin, skin appendages.~~

Superficial fascia, deep fascia, modifications of deep fascia

4. Muscle

Classification – Structural (in detail during histology lect.), functional and morphological

Origin, Insertion, Tendon, ligaments, Bursae

5. Circulatory System

Types of circulation and its importance; classification of vessels (anatomical and physiological); Factors affecting venous return.

Structure of blood vessels, anastomosis, end arteries

6. Lymphatic System

Lymphatic circulation, circulating lymphocytes, lymphoid tissue

7. Nervous System

Classification – Central Nervous System, Peripheral nervous system (PNS) and autonomic nervous system (ANS)

CNS Brain and Spinal Cord

PNS – Cranial Nerves, Spinal Nerves Typical Spinal Nerve & Dermatomes

ANS-Sympathetic Parasympathetic

Classification Neurons & Nerve fibres

Glial cells

Desirable To Know

Bursitis Kinesiology, close packed and loose packed joints, range of movements, spin, swing, levers

Langer's lines, Flexure creases, Dermatoglyphics, Skin graft, atherosclerosis, Myelination

II Upper limb

Must Know:

1. Regions - Back, Scapular region, Pectoral region, Mammary gland, axilla, front of arm, back of arm, Cubital fossa, front of forearm, palm, back of forearm Anatomical snuff box.
2. Bones - Humerus, Scapula, Clavicle, Radius, Ulna, articulated hand. supracondylar fracture, colles fracture
3. Muscle Attachments, Nerve Supply, actions. Intrinsic muscles of hand
4. Nerves - Brachial plexus, Radial Nerve, Median nerve, Ulnar nerve, axillary nerve, musculocutaneous nerve.
5. Vessels – Axillary artery, Subscapular anastomosis, brachial artery, radial and ulnar arteries, superficial and deep palmar arches.
6. Joints – shoulder girdle, elbow joint wrist joint, Superior and inferior radioulnar joint 1st carpometacarpal joint.
7. Applied – Erb's palsy, klumpke's paralysis, winging of scapula, Tennis elbow, wrist drop, claw hand, dupuytren's contracture, carpal tunnel syndrome.

Desirable to know

Palmar spaces and its clinical importance, fracture of neck of Humerus.

III Lower limb

1. Regions: - Front of thigh, femoral triangle, femoral sheath. Gluteal region, adductor canal, popliteal fossa, back of thigh.

2. Bones-Hip bone, Femur, Tibia, Fibula, Patella, articulated foot, Special mention about talus and calcaneum.

3. Muscles – Attachments, nerve supply and actions of quadriceps femoris, gluteus maximus, Gluteus medius and minimus. Adductor group, hamstring group, Muscles of leg specially soleus and muscular layer of sole.

4. Nerves – Femoral nerve, Obturator nerve, Sciatic nerve, Tibial and common peroneal nerve, foot drop.

5. Vessels – Femoral artery, popliteal artery, vessels of leg and sole and venous drainage of lower limb.

6. Joints – Hip joint, knee joint, ankle joint, subtalar joint, arches of foot, trendelenburg sign and test, dislocation of hip joint.

Desirable to know

Femoral hernia, cruciate and trochanteric anastomosis, blood supply of head of femur, fracture neck of femur, Meniscal tear, cruciate ligament tear, varicose vein,

IV Thorax

Bones – Ribs, sternum, Thoracic vertebrae

Thoracic cage – Inlet, outlet, intercostal spaces with its blood supply and nerve supply with its clinical importance and mechanism of respiration.

Mediastinum – Divisions of mediastinum and boundaries and contents

Pleura, lung, Bronchopulmonary segments

Pericardium and heart

Diaphragm – development, Nerve supply, openings.

Vessels of thorax: Aorta, azygous venous system, superior vena cava and its tributaries.

pleuritis, pleural effusion, Pericardial effusion, myocardial infarction, congenital anomalies of heart

Diaphragmatic hernia

Desirable to know –

Intercostal drainage, Medistenal syndrome.

V Abdomen and pelvis

Must Know:

1. Bones – Pelvis: Types of pelvis, dimensions of pelvis and pelvimetry and difference between male and female, lumbar vertebrae, sacrum
2. Anterior abdominal wall – Muscles, nerves, blood supply, Rectus sheath and scrotum and inguinal canal.
3. Spermatic cord
4. Testis
5. Peritoneum – Greater sac, lesser sac, Epiploic foramen, Greater omentum lesser omentum, Vertical and horizontal disposition and mesentries.
6. Organs

    Liver, extrahepatic biliary apparatus portal vein, porto caval anastomosis

    Stomach

    Duodenum

    Small and large intestine

    Posterior abdominal wall: muscles, abdominal aorta and inferior vena cava.

    Rectum and anal canal

Pancreas, spleen, Appendix, kidney, suprarenal glands, ureter, prostate Uterus, fallopian tubes, ovary, urinary bladder – neurological bladder

6. Pelvis, Pelvic diaphragm

Perineal pouches, ischiorectal fossa, male urethra, Pelvic vessels and nerves. Abdominal incisions – hernia – inguinal and incisional; Peptic ulcer, carcinoma pancreas, pancreatitis, colonoscopy, proctoscope, splenomegaly, appendicitis, hydronephrosis ureteric stones, cystoscopy. prostatectomy, pouch of douglas. Tubectomy, ovarian cyst, cervical carcinoma, psoas abscess.

Desirable to know:

Abdominal incisions – hernia – inguinal and incisional, vasectomy, varicocele, hydrocele, subphrenic spaces, ascites and abdominal tapping, Hepatic Segments, cholecystitis, liver biopsy, gastroscopy,

V Neuroanatomy

Must Know:

1. Spinal cord – External features, internal features, spinal meninges ascending and descending tracts, lumbar puncture, Blood supply of spinal cord and its clinical anatomy.

2. Medulla oblongata

External and internal features, Blood Supply, sections at sensory, pyramidal and olivary with correlation of nuclei and functional aspect. With vascular lesions and syndromic approach.

3. Pons

External and internal features and sections with nuclei and functional aspect. With vascular lesions and syndromic approach.

4. Cerebellum

Classification – anatomical and functional.

Peduncles – Superior, middle and inferior cerebellar peduncles, deep cerebellar nuclei.

Intracerebellar connections, functions of cerebellum.

Blood supply and vascular lesions.

5. 4th Ventricle and overall view of ventricular system and its communication.

(Boundaries, floor, roof).

6. Mid brain

External and internal features sections with lesions and reflexes.

7. Cerebrum

Surfaces and borders, lobes, sulci and gyri, functional areas

Blood supply

White matter – Classification, corpus callosum, internal capsule – components, blood supply & applied anatomy

Grey matter – Basal ganglia and its connections

8. Lateral ventricle

9. Diencephalon

Parts of diencephalon

Thalamus, hypothalamus. Gross connections major nuclei.

10. 3rd ventricle

Boundaries, recess

11. Blood Supply of Brain

Circle of willis

CSF circulation cisterns,

12. Meninges

Layers, dural folds, Dural venous sinuses.

13. Limbic system with tela chor., fornix.

14. Reticular formation.

15. Autonomic nervous system.

Clinical correlation syringomychia, Brown Sequard Syndrome, poliomyelitis tractotomy. Vertebral venous plexus, medullary syndromes. Arnold chiari syndrome. Pontine haemorrhage, pontine tumors. Cerebellar dysfunctions. Weber's syndrome Benedict's syndrome.

Desirable to know

met thalamus, Subthalamus, epithalamus.

split brain syndrome. Lesions of Basal ganglia vantriculegsephy. Hydrocephalus V-A Shint. Quickenstedf's sign. Blood brain barrier Nerve supply of dura cavernous sinus thrombosis cerebral naemoerhage cisternal puncture. Epidural spaces choroid plexus.

Spinal cord Cervical, thoracic lumar, sacral spinal, parasympathelic ganglia.

VI Head, Face & Neck

Must Know:

1. Bones skull – Normas, Parietal, Frontal, occipital, temporal, Mandible, Cervical vertebrae, fetal skull and Cranial fossa.

2. Scalp

3. Face – Muscles, Blood supply and nerve supply.

4. Neck – Triangles of neck – Boundaries and contents

Midline structure of neck

Deep cervical fascia

Muscles – Sternocleidomastoid, Trapezius, hyoglossus, Mylohyoid, Strap muscles.

Nerves – Over view of cranial nerves with its functional components and Trigeminal, Occulomotor nerve with abducent and trochlear, Hypoglossal nerve, vagus nerve, glossopharyngeal nerve, spinal accessory Nerve and fascial nerve.

Blood vessels – External carotid artery, subclavian artery.

Veins – Common carotid artery and Internal and external jugular veins

Glands – Parotid, thyroid, submandibular and sublingual glands.

5. Infratemporal fossa.

Muscles of mastication

Mandibular nerve

Maxillary artery

Parasymphathetic ganglions of HNF: Otic, Submandibular, Pteriogopalatine and ciliary ganglion.

Pterigoid plexus

Temporo Mandibular joint

6. Organs – Tongue, pharynx, larynx, Nasal cavity, orbit – muscles, nerves and vessels

Ear – Middle ear, tympanic membrane

Eye Ball, Extraocular muscles its attachments, nerve supply and movements.

Pallete, Tonsil and Para nasal sinuses.

Clinical anatomy: Dangerous area of face, Bell's palsy, dislocation of temporomandibular joint. Thyroidectomy. Subclavian steal syndrome, posterior triangle cold abscess, carcinoma tongue.

Desirable to know: -

Dangerous area of face, Bell's palsy, dislocation of temporomandibular joint. Thyroidectomy. Subclavian steal syndrome, posterior triangle cold abscess, carcinoma tongue, Nerve palsies of vocal cord, Internal ear, external ear tympanoplasty.

VII Histology

A. General histology

1. Microsopy and Types of microscope and lab techniques for H & E staining

1a: cell: Organelles and cytoskeleton.

2. Epithelia & glands – classification, cell surface modification

3. Connective tissue classification and formation its cellular component and matrix and tis clinical importance.

4. Cartilage classification and its composition.

5. Bone classification and its structure and cellular components.

6. Muscle

Classification and its structure and differences

Skeletal muscle, cardiac muscle and smooth muscle

7. Nervous tissue : Peripheral nerve.

Neurons, Glial, cells, myelination

8. Blood vessels: endothelium its modifications and functions.

Elastic artery, muscular artery, capillaries and vein

9. Lymphoid tissue

Thymus, spleen, lymphnode, tonsil – payer's patches, MALT

10. Skin - Thick skin, Thin skin, hair follicle and appendages.

B. Systemic histology

1. GIT

Lip, tongue, salivary glands

Submandibular parotid and sublingual glands

Oesophagus, Stomach, fundus, pylorus SI – Duodenum, Jejunum ileum

Large intestine, appendix

Accessory glands Liver, pancreas (Exocrine and endocrine) , gall bladder

2. Respiratory system (Overveiw of respiratory epithelum).

Epiglottis, Trachea, lung, Bronchi

3. Urinary system

Kidney, ureter, urinary bladder

4. Male reproductive system

Testis, Epididymis. Vas deferens, prostate

5. Female RS

Ovary, Fallopian tube, uterus, mammary gland and placenta, Umbilical cord.

6. Endocrine system

Pituitary gland, Thyroid and parathyroid glands, suprarenal gland

7. Nervous system: Spinal cord, Cerebrum and Cerebellum

8. Eye – Retina Cornea

9. Internal ear.

10. Intercelilular junctions developing bone. Growth of bone. Hypertophy, hyperplasia. Blood thymus barrier. Open and closed circulation. Hyprothalamo pituitary porta system.

Desirable to Know

Electron microscopy

Diabetes mellitus Hyaline membrane disease. Heart failure cells, juxta glomerular apparatus.. Pheochromocytoma

VIII Embryology

A. General – Cell division – mitosis & meiosis, crossing over.

Gametogenesis, spermatogenesis Oogenesis, follicular development and fertilization.

1st week of development – Zygote, cleavage division, Morula, blastocyst, implantation

2nd week of development -

Bilaminar embryonic disc, embryoblast, trophoblast, amniotic cavity, yolk sac chorion.

3rd week of development

Trilaminar embryonic disc, primitive streak, notochord, development of neural tube, Neural crest cells, vasculogenesis.

4th week of development

Folding of embryo – craniocaudal and lateral, foetal membrane – chorion, amnion, yolk sac, allantois umbilical cord.

Derivatives of 3 germ layers. Ectoderm, endoderm, mesoderm

Placenta

Role of molecular basis of primitive streak and Notochord on axis development.

Twining.

Teratology.

B. Systemic

1. GIT – Foregut, midgut, hindgut; Derivatives of each and Rotation of stomach and Gut.

Pancreas, liver

2. Urogenital

Kidney, ureter, UB, Uterus, FT, ovary & testis, external genitalia

3. Cardiovascular system

Development of heart folding of heart tube development of 4 chambers and Interatrial septum and ventricular septum and ASD and VSD and Fallot's tertralogy, aortic arches, foetal circulation

4. Respiratory system

Development of lungs

4a. Development of face,

Pharyngeal arches and pouches.

5. Nervous system

Development of functional components, neural crest cells. Neural tube folding formation of brain vesicles.

6. Development of skeletal system and concept of ectodermal and mesodermal interactions.

Developmental anomalies of GIT urinary system.

Development anomalies of heart & aortic arches. Development – IVC & portal vein tracheo esophageal fistula.

Desirable to know

Contraceptive methods, artificial-reproductive techniques chorionicvillis biopsy amniocenteris, fetoscopy USG, pregnanacy test. Sacrocoecygeal teratoma neural tube defects.

IX Genetics

Introduction

Mendel's Laws Chromosome-classification

Common syndrome, Gene, Codon.

Developmental genetics.

Numerical & structural aberrations Mendelian inheritance.

Hemoglobin disorders, thalassemia and sickle cell anaemia.

Cell cycle and cancer genetics.

Pedigree chart, prenatal genetic diagnosis, Genetic counseling.

Human Genome project.

X Radiological Anatomy

Principle of plain radiograms and CT scan, Ultrasonography, Color dopplar, MRI and PET scan and Nuclear Medicine. _Overview of various imaging techniques and role in diagnosis of human diseases or diorders.

Plain X – Concept of AP and Lateral view and X-Rays of shoulder elbow & wrist, hand hip joints, knee, ankle and foot, head. Concept of Estimation of age with x-rays.

AP and lateral x-ray of Skull and Paranasal sinuses water's view, cervical vertebra and lumbar vertebra lateral view.

Thorax – Plain X-ray of thorax AP and lateral

Abdomen – plain AP and lateral, contrast - Barium swallow, meal enema & follow through

Cholecystography,

pylography cystogram,

hysterosalpingography,

myelography bronchogram. Carotid angiogram, Abdominal aortogram.

Ultrasonography in developing fetus.

CT Scan. Plain and contrast, MRI

XI Living anatomy

Peripheral arterial pulsations

Bony prominences with relevant vertebral levels.

Joint movements: Shoulder joint, Pronation and supination, movements of thumb.

Movements of neck, trunk and knee joint, movements at fingers and ankle and subtalar joint.

Muscle testing: Tendon reflex with root values.

Nerve palpation – ulnar N. Common Peroneal Nerve

Landmarks seen externally and its clinical importance.

Anatomical snuff box

Skills – Site for lumbar puncture, sternal pericardial tapping, liver biopsy. Locate veins for venesection, locate site for emergency tracheostomy.

List of Prescribed books:

Prescribed Books for MBBS course, for *Anatomy*
MGM Indstitute of Health Sciences, Navi Mumbai.

Text Books

	Gen. Anatomy	Author	Edition
1	Hand book of General Anatomy	B. D. Chaurasia	5th
2	General Anatomy	Vishram Singh	2nd
	Gross Books		
1	Human Anatomy Vol I, II, III	B. D. Chaurasia	6th
2	Anatomy Vol I, II, III	Vishram Singh	2nd
3	Clinical Anatomy	Neeta Kulkarni	3rd
4	Manual of Practical Anatomy	Cunnigham's	15th
5	Grants Dissector	Tank	2nd
	Atlas		
1	Grant's Atlas of Anatomy	Agur	13th
2	Netter's Atlas of Anatomy		5th
	Histology		
1	Textbook of Human Histology	Inderbir Singh's	7th
2	Textbook of Histology (A Practical Guide)	J.P. Gunasegaran	2nd
3	Textbook of Histology	Krishna Garg	3rd
	Embryology		
1	Human Embryology	Inderbir Singh's	10th
2	Medical Embryology	Langman's	11th
	Neuroanatomy		
1	Textbook of Human Neuroanatomy	Inderbir Singh's	9th
2	Textbook of Clinical Neuroanatomy	Vishram Singh	2nd
	Genetics		
1	Medical Genetics	G P Pal	1st
2	Human Genetics	S. D. Gangane	4th

Prescribed Books for MBBS course, for *Anatomy*
MGM Indstitute of Health Sciences, Navi Mumbai.

Reference Books

	Anatomy	Author	Edition
1	Gray's Anatomy		40th
2	Clinical Anatomy by Regions	R. Snell	8th
3	Last's Anatomy (Regional and Applied)	Sinnatamby	12th
4	Recent Human Anatomy Vol: I, II, III	J Prasad	2nd
5	Atlas of Anatomy (Thieme)	Gilroy	3rd
	Histology		
1	Basic Histology Text and Atlas	Junqueira	13th
2	Functional Histology (A Text and Atlas)	Wheater's	6th
	Embryology		
1	The Developing Human	Keith Moore	9th
2	Human Embryology and Developmental Biology	Carlson	5th
	Neuroanatomy		
1	Functional Neuroanatomy (Text and Atlas)	Afifi	2nd
	Genetics		
1	Medical Genetics	Jorde	4th
2	Essentials of Human Genetics	Kothari	5th
3	Genetics in Medicine	Thompson & Thomson	8th

RULES & REGULATIONS OF EXAMINATION FOR THE SUBJECTS OF FIRST MBBS COURSE AT CONSTITUENT COLLEGES OF MGM UNIVERSITY OF HEALTH SCIENCES, NAVI MUMBAI
(Approved vide BOM – 04/2007 Resolution No. 4 and amended vide BOM-07/2008 Resolution No. 3.2)

1. **THEORY EXAMINATION IN ANATOMY**
   - 1.1. There shall be two papers in preliminary/university examination in the Anatomy The course content shall be distributed as per given below:
   - 1.2. **ANATOMY PAPER-I-** shall includes gross anatomy, systemic histology and systemic embryology of the region Superior extremity, head face, neck and neuro Anatomy.
   - 1.3. **ANATOMY PAPER –II:** shall includes the gross anatomy, systemic histology and systemic '1 embryology of the region Thorax, Abdomen, Pelvix, interior extremity , General histology, General embryology, general anatomy & genetics.
2. **PRACTICAL EXAM. PATTERN:**
   - 2.1. Total Marks for Orals (Viva) — 20 marks
     - 2.1.1. i) Axial Skeleton — 10 marks
     - 2.1.2. ii) Appendicular skeleton — 5 marks
     - 2.1.3. iii)Embryology models — 5 marks
3. **DISTRIBUTION OF PRACTICAL MARKS**
   - 3.1. Soft parts dissected body, organs, viscera, brain Histology — 20 marks
   - 3.2. spotting — 6 marks
   - 3.3.one slide for discussion — 4 marks
   - 3.4.Radiology — 5 marks
   - 3.5.Surface anatomy — 5 marks

Resolution No. 3.1(c): Resolved to shift 'Thorax' portion from Anatomy (1st MBBS) Paper II to Paper I to have proper distribution in two papers for the batch of Students to be admitted in 1st MBBS from the academic year 2016-17 onwards.

(Approved vide BOM – 43/2015, Resolution No. – 3.1(c))

Approved As per BOM 40/2015, Dated 13/05/2015
Resolution No. - 3.1 (e)

Resolution No. 3.1(e): Resolved to redistribute the marks in Anatomy MBBS practical Viva as below:

Distribution of Viva Marks:-

	Previous	Proposed
1.Axial Skeleton	7	5
2.Appendicular Skeleton	6	8
3.Embryology	7	5
4. Genetics	0	2

Approved As per BOM 45/2016, Dated 28/04/2016
Resolution No. - 3.1 (b)

Resolution No. 3.1(b): Resolved to accept revised method to calculate internal assessment marks for Ist MBBS as given below from the academic year 2016 -17 onwards:

For Theory:

	Anatomy	Physiology	Biochemistry
1st Sem. & Prelim Exam.	15	15	15
Day to day assessment as per MCI norms	05	05	05
Total marks	20	20	20

For Practical:

	Anatomy	Physiology	Biochemistry
1st Sem. & Prelim Exam.	15	15	15
Day to day assessment as per MCI norms	05	05	05
Total marks	20	20	20

DEPARTMENT OF PHYSIOLOGY
MGM MEDICAL COLLEGE, KAMOTHE, NAVI MUMBAI

MGM/MED-C/PHY/2016/626 Date: 28.12.2016

To
The Registrar
MGM IHS,
Navi Mumbai

Subject: First MBBS Syllabus for Human Physiology, Human Anatomy & Human Biochemistry subjects.

Sir,

Please find herewith the First MBBS Syllabus for Human Physiology, Human Anatomy & Human Biochemistry syllabus, as submitted by HODs after due discussion sent by email registrar@mgmuhs.com & dyr@mgmuhs.com.

This is for your kind information and necessary action.

Thanking you,

Yours sincerely,

Academic Council
28.12.16

Dr. R. S. Inamdar
Chairman
Pre Clinical BOS
Professor & Head
Department of Physiology
MGM Medical College,
Kamothe, Navi Mumbai

MGM Institute Of Health Sciences
INWARD NO. 10699
DATE: 28/12/16
REF:

SYLLABUS
FOR
ANATOMY

INDEX

Sr. No	Item	Page No.
1.	Broad Curriculum As Per MCI Guidelines for Human Anatomy	3
2.	Syllabus of Anatomy	4 - 13
3.	Syllabus anatomy teaching hour distribution	14-28
4.	Books for Anatomy	29
5.	Examination pattern	30-31
6.	Model University Examination Question Paper	31-37
7.	Topics for horizontal integration in I-MBBS	38

BROAD CURRICULUM AS PER MCI GUIDELINES (HUMAN ANATOMY)

(a) Goal

The broad goal of the teaching of undergraduate students in Anatomy aims at providing comprehensive knowledge of the gross and microscopic structure and development of human body to provide a basis for understanding the clinical correlation of organs or structures involved and the anatomical basis for the disease presentations.

(b) **Objectives** :

A. **Knowledge** :

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

(a) Comprehend the normal disposition, clinically relevant interrelationships, functional and cross sectional anatomy of the various structures in the body.

(b) Identify the microscopic structure and correlate elementary ultra-structure of various organs and tissues and correlate the structure with the functions as a prerequisite for understanding the altered state in various disease processes.

(c) Comprehend the basic structure and connections of the central nervous system to analyze the integrative and regulative functions and systems. He / She should be able to locate the site of gross lesions according to the deficits encountered.

(d) 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/She should be able to explain the developmental basis of the major variations and abnormalities.

B. **Skills**:

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

(a) Identify and locate all the structures of the body and mark the topography of the living anatomy.

(b) Identify the organs and tissues under the microscope.

(c) Understand the principles of karyotyping and identify the gross congenital anomalies.

(d) Understand principles of newer imaging techniques and interpretation of Computerized Tomography (CT) Scan, Sonogram etc.

(e) Understand clinical basis of some common clinical procedures i.e., intramuscular & intravenous injection, lumbar puncture and kidney biopsy etc.

C. **Integration**

From the integrated teaching of other basic sciences, student should be able to comprehend the regulation and integration of the functions of the organs and systems in the body and thus interpret the anatomical basis of disease process.

I-MBBS ANATOMY SYLLABUS

I General Anatomy

Must know

1. Introduction to Anatomy

2. Terminology

3. Introduction of imaging techniques.

4. Bone –Classification, Sesamoid bone, Parts of a growing long bone blood supply of long bone. Parts of long bone, epiphysis and its types, ossification and its classification, Laws of ossification.

5. Joints – Classification
   Fibrous joints, cartilaginous joints, Synovial joints – Classification & details

6. Skin and fascia
   Structure and Functions of Skin
   Superficial fascia, deep fascia, modifications of deep fascia

7. Muscle
   Classification – Structural (in detail during histology lect.), functional and morphological
   Origin, Insertion, Tendon, ligaments, Bursae.

8. Circulatory System
   Types of circulation and its importance, classification of vessels (anatomical and physiological), Factors affecting venous return, Structure of blood vessels, anastomosis, end arteries.

9. Lymphatic System
   Lymphatic circulation, circulating lymphocytes, lymphoid tissue

10. Nervous System
    Classification – Central Nervous System, Peripheral nervous system (PNS) and autonomic nervous system (ANS)
    PNS – Cranial Nerves, Spinal Nerves, Typical Spinal Nerve, Myelination & Dermatomes
    Classification of neurons, Nerve fibres & Glial cells

Desirable to know

Close packed and loose packed joints, range of movements, spin, swing, levers,Langer's lines, Flexure creases, atherosclerosis.

Nice to know

Bursitis Kinesiology, Dermatoglyphics, Skin graft

II Upper limb

Must know

1. Regions - Pectoral region, Mammary gland, Scapular region & back, axilla, front of arm, back of arm, Cubital fossa, Front of forearm, palm, Back of forearm Anatomical snuff box.

2. Bones - Clavicle, Scapula, Humerus, Radius, Ulna, Articulated hand, Supracondylar fracture, Colles fracture

3. Muscle Attachments, Nerve Supply, actions of important muscles of all regions especially-deltoid, pectoralis major, serratus anterior, Trapezius, lattissimus dorsi, biceps, triceps, brachioradialis, pronator teres, Intrinsic muscles of hand

4. Nerves - Brachial plexus, Radial Nerve, Median nerve, Ulnar nerve, Axillary nerve, Musculocutaneous nerve.

5. Vessels – Axillary artery, Subscapular anastomosis, brachial artery, radial and ulnar arteries, superficial and deep palmar arches, Veins of upper limb.

6. Joints – shoulder girdle, elbow joint, wrist joint, Superior and inferior radioulnar joints, 1st carpometacarpal joint.

7. Applied – Erb's palsy, Klumpke's paralysis, Winging of scapula, Tennis elbow, Wrist drop, claw hand, Dupuytren's contracture, carpal tunnel syndrome.

Desirable to know

Deep Muscles of Back, Palmar spaces and its clinical importance, fracture neck Humerus, Dermatomes of upper limb.

Nice to know

Grips of hand

III Lower limb

Must know

1. Regions: - Front of thigh, femoral triangle, femoral sheath, adductor canal, Gluteal region, back of thigh, popliteal fossa, leg compartments, sole.

2. Bones-Hip bone, Femur, Tibia, Fibula, Patella, articulated foot, Special mention about talus and calcaneum.

3. Muscles – Attachments, nerve supply and actions of important muscles of all regions especially - quadriceps femoris, gluteus maximus, Gluteus medius and minimus. Adductor group, hamstring group, Muscles of leg specially soleus and names of muscular layers of sole.

4. Nerves – Femoral nerve, Obturator nerve, Sciatic nerve, Tibial and common peroneal nerve, foot

5. Vessels – Femoral artery, popliteal artery, vessels of leg and sole and venous drainage of lower limb.

6. Joints – Hip joint, knee joint, ankle joint, subtalar joint, arches of foot, Trendelenburg sign, dislocation of hip joint.

Desirable to know

Femoral hernia, cruciate and trochanteric anastomosis, blood supply of head of femur, Meniscal tear, cruciate ligament tear, varicose veins, Dermatomes of lower limb.

Nice to know

Fracture neck of femur, Trendelenberg's test, Walking Cycle.

IV Head, Face & Neck

Must know

1. Bones skull – Normas-verticalis, occipitalis, Frontalis, lateralis, basalis, interior of skull, Mandible, Cervical vertebrae, fetal skull Scalp

2. Face – Muscles, Blood supply and nerve supply.

3. Neck – Triangles of neck – Boundaries and contents, Midline structure of neck, Deep cervical fascia

4. Muscles – Sternocleidomastoid, hyoglossus, Mylohyoid, Strap muscles, lateral pterygoid

5. Meninges - Layers, dural folds, Dural venous sinuses.

6. Cranial Nerves – Over view of cranial nerves with its functional components, Occulomotor nerve with abducent and trochlear, Trigeminal, facial nerve, glossopharyngeal nerve, vagus nerve, accessory Nerve and Hypoglossal nerve

7. Blood vessels – Common carotid artery and External carotid artery, subclavian artery, Internal and external jugular veins

8. Glands – Parotid, thyroid, submandibular and sublingual glands, Pituitary.

9. Infratemporal fossa - Muscles of mastication, Mandibular nerve, Maxillary artery, Parasymphathetic ganglia of HNF: Otic, Submandibular, Pteriogopalatine and ciliary ganglion, Pterygoid Venous plexus, Temporo Mandibular joint

10. Organs – Tongue, Palate, pharynx, Tonsil, larynx, Nasal cavity, Para nasal sinuses, orbit – muscles, nerves and vessels, Ear – Middle ear, tympanic membrane

Desirable to know

Dislocation of temporomandibular joint. Thyroidectomy. Subclavian steal syndrome, posterior triangle cold abscess, Nerve palsies of vocal cord, Internal ear, external ear.

Nice to know

Carcinoma tongue, tympanoplasty, tracheostomy

V Neuroanatomy

Must know

1. Spinal cord – External features, internal features, spinal meninges, ascending and descending tracts, lumbar puncture, Blood supply of spinal cord and its clinical anatomy, syringomychia, Brown Sequard Syndrome, poliomyelitis,Vertebral venous plexus,

2. Medulla oblongata- External and internal features, Blood Supply, sections at sensory, pyramidal and olivary levels with correlation of nuclei and functional aspect, vascular lesions and syndromes.

3. Pons-External and internal features and sections with nuclei and functional aspect, vascular lesions and syndromes.

4. Mid brain-External and internal features sections with lesions and syndromes.

5. Cerebellum-Classification – anatomical and functional.
   Peduncles – Superior, middle and inferior cerebellar peduncles, deep cerebellar nuclei, connections, functions of cerebellum, Blood supply and vascular lesions.

6. Overall view of ventricular system and its communication, CSF circulation, cisterns,

7. 4th Ventricle - Boundaries, floor, roof.

8. Cerebrum-Surfaces and borders, lobes, sulci and gyri, functional areas, Blood supply, White matter – Classification, corpus callosum, internal capsule –parts, blood supply & applied anatomy, Grey matter – Basal ganglia and its connections

9. Lateral ventricle - Boundaries, floor, roof

10. Diencephalon-Parts of diencephalon, Thalamus, hypothalamus - Gross connections, major nuclei.

11. 3rd ventricle Boundaries, floor, roof and recesses

12. Blood Supply of Brain, Blood brain barrier, Circle of Willis

13. Autonomic nervous system.

14. Limbic system.

Desirable to know

Metathalamus, Subthalamus, epithalamus, split brain syndrome, Lesions of Basal ganglia, Hydrocephalus V-A Shunt. Queckenstedt's sign, Nerve supply of dura, cerebral haemorrhage, cisternal puncture, Arnold Chiari syndrome, Epidural spaces, Pontine haemorrhage, pontine tumors, Reticular formation.

Nice to know

Spinal cord - Cervical, thoracic lumbar, sacral level transverse sections, Ventriculography, tractotomy.

V Thorax

Must Know

1. Bones – Ribs, sternum, Thoracic vertebrae
2. Joints of Thorax
3. Thoracic cage – Inlet, outlet, intercostal spaces with its blood supply and nerve supply with its clinical importance, mechanism of respiration.
4. Mediastinum – Divisions of mediastinum and boundaries and contents
5. Pleura, lung, Bronchopulmonary segments, Pleuritis, pleural effusion.
6. Pericardium and heart, Pericardial effusion, myocardial infarction
7. Oesophagus
8. Diaphragm – development, Nerve supply, openings, Diaphragmatic hernia.
9. Vessels of thorax: Aorta, azygous venous system, superior vena cava and its tributaries, thoracic duct

Desirable to know –

Intercostal drainage, Mediastinal syndrome.

Nice to know

Thymus

V Abdomen and pelvis

Must know

1. Bones – Pelvis: Types of pelvis, dimensions of pelvis and pelvimetry and difference between male and female, lumbar vertebrae, sacrum
2. Anterior abdominal wall – Muscles, nerves, blood supply, Rectus sheath and inguinal canal, Abdominal incisions – hernia – inguinal and incisional.
3. Spermatic cord, Testis, scrotum, prostate, prostatectomy, male urethra.
4. Peritoneum – Greater sac, lesser sac, Epiploic foramen, Greater omentum lesser omentum, Vertical and horizontal disposition and mesentery, pouch of Douglas
5. Organs-Stomach, Peptic ulcer,
   Duodenum Small and large intestine, Appendix, colonoscopy, appendicitis,
   Liver, extrahepatic biliary apparatus portal vein, Porto caval anastomosis,
   Rectum and anal canal, proctoscopy.

Pancreas, spleen, carcinoma pancreas, pancreatitis, splenomegaly,
kidney, suprarenal glands, ureter, urinary bladder – neurological bladder,
hydronephrosis ureteric stones, cystoscopy.
Uterus, fallopian tubes, ovary, Tubectomy, ovarian cyst, cervical carcinoma,

6. Posterior abdominal wall: muscles, nerves, psoas abscess.

7. Abdominal aorta and inferior vena cava.

8. Pelvis, Pelvic diaphragm, Pelvic vessels and nerves.

9. Perineal pouches, ischiorectal fossa,

Desirable to know

Abdominal incisions,Vasectomy, varicocele, hydrocele, ascites and abdominal tapping, Hepatic Segments, cholecystitis, liver biopsy.

Nice to know

Subphrenic spaces, Gastroscopy,

VII Histology

Must know

A. General histology-

1. Microsopy and Types of microscopes and lab techniques for H & E staining
2. Cell: Organelles and cytoskeleton.

3. Epithelia & glands – classification, cell surface modification, cell junctions.

4. Connective tissue classification, cells and matrix and its clinical importance.

5. Cartilage classification and structure.

6. Bone classification, structure and cells, developing bone, growth of bone, hypertrophy, hyperplasia.

7. Muscle-Classification, Skeletal muscle, cardiac muscle and smooth muscle structure

8. Nervous tissue – Peripheral nerve, sensory ganglia, autonomic ganglia.

9. Blood vessels- endothelium-structure and functions, classification of blood vessels, Elastic artery, muscular artery, capillaries and vein structure

10. Lymphoid tissue-Thymus, blood thymic barrier, spleen, open & closed circulation, lymph node, MALT-tonsil

11. Skin - Thick skin, thin skin, hair follicle and appendages.

B. Systemic histology

1. GIT-
   Lip, tongue, salivary glands-Submandibular parotid and sublingual glands
   Oesophagus, Stomach-fundus, pylorus, small Intestine – Duodenum, Jejunum, ileum,
   Large intestine, appendix, Accessory glands- Liver, pancreas, gall bladder

2. Respiratory system -Epiglottis, Trachea, lung

3. Urinary system-Kidney, ureter, urinary bladder

4. Male reproductive system-Testis, Epididymis. Vas deferens, prostate

5. Female reproductive system-Ovary, Fallopian tube, uterus, mammary gland and placenta.

6. Endocrine system-Pituitary gland, Hyprothalamo pituitary portal system, Thyroid and parathyroid glands, suprarenal gland

7. Nervous system- Cerebrum and Cerebellum

8. Eye – Retina, Cornea

Desirable to know

Umbilical cord, Spinal cord, Internal ear, Diabetes mellitus,

Nice to know

Hyaline membrane disease, Pheochromocytoma, Electron microscopy

VIII Embryology

Must know

A. General Embryology

1. Cell division – mitosis & meiosis.

2. Gametogenesis- spermatogenesis Oogenesis, follicular development and fertilization.

3. 1st week of development – Zygote, cleavage, morula, blastocyst, implantation

4. 2nd week of development -Bilaminar embryonic disc, embryoblast, trophoblast, amniotic cavity, yolk sac, chorion.

5. 3rd week of development - Gastrulation,Trilaminar embryonic disc, primitive streak, notochord, development of neural tube, Neural crest cells, vasculogenesis.

6. 4th week of development - Folding of embryo – craniocaudal and lateral, foetal membrane – chorion, amnion, allantois umbilical cord.

7. Derivatives of 3 germ layers. Ectoderm, endoderm, mesoderm

8. Placenta

B. Systemic Embryology

1. GIT – Foregut, midgut, hindgut; Derivatives of each and Rotation of stomach and midgut, Pancreas, liver, Developmental anomalies of GIT, tracheo esophageal fistula.

2. Urogenital - Kidney, ureter, UB, Uterus, FT, ovary & testis, external genitalia and developmental anomalies

3. Cardiovascular system - Development of heart, folding of heart tube, development of 4 chambers and Interatrial and interventricular septum and ASD and VSDs and Fallot's tertralogy, aortic arches, Development anomalies of aortic arches, foetal circulation

4. Respiratory system - Development of lungs

5. Head, face & neck - Development of face, Pharyngeal arches and pouches.

6. Nervous system - Development of functional components, neural crest cells. Neural tube folding formation of brain vesicles, neural tube defects.

Desirable to know

Twining. Teratology, Development – IVC & portal vein, artificial reproductive techniques

Nice to know

Development of skeletal system & limbs, fetoscopy

IX Genetics

Must know

1. Introduction
2. Mendel's Laws Chromosome-classification
3. Karyotyping
4. Barr body, Lyon's hypothesis
5. Chromosomal abnormalities, syndromes
6. Inheritance
7. Genetic Counseling
8. Prenatal Diagnosis.

Desirable to know

Developmental genetics, Hemoglobin disorders, thalassemia and sickle cell anaemia, cancer genetics, Pedigree chart, Human Genome project.

Nice to know

Gene therapy, genetic engineering, population genetics.

X Radiological Anatomy

Must know

1. Overview of various imaging techniques and role in diagnosis of human diseases
2. Principle of plain radiograms and CT scan, Ultrasonography, MRI
3. Plain Xray – Concept of AP and Lateral view
4. Limbs – shoulder, elbow, wrist joints & hand, hip, knee, ankle joints and foot, AP and lateral
5. Head, face & neck - Skull and Paranasal sinuses, Water's view, cervical vertebrae and lumbar vertebrae lateral view.
6. Thorax – Plain X-ray of thorax PA and lateral views
7. Abdomen – plain AP and lateral, contrast - Barium swallow, meal, enema & follow through, Cholecystography, pylography, cystogram, hysterosalpingography
8. CT scan. Plain and contrast, MRI

Desirable to know

Concept of Estimation of age with x-rays, Color Doppler, Carotid angiogram.

Nice to know

Myelography bronchogram, Abdominal aortogram. Ultrasonography in developing fetus, PET scan and Nuclear Medicine

XI Living anatomy

Must know

1. For upper limb, Lower limb, Thorax, Abdomen, Pelvis & Head, Face, Neck -
   Bony prominences with relevant vertebral levels.
   Joint movements - for example, Shoulder joint, Pronation and supination, movements of thumb, movements at fingers, hip joint, knee joint, ankle and subtalar joint.
   Movements of neck, trunk
   Muscle testing - Tendon reflex with root values.
2. Nerve palpation – ulnar Nerve, common peroneal Nerve
3. Important Landmarks and clinical importance - for example - Anatomical snuff box
4. Peripheral arterial pulsations – for example - brachial, radial, femoral, posterior tibial, dorsalis pedis artery
5. Knowledge of certain procedures like lumbar puncture, pericardial tapping, liver biopsy, Locating veins for venesection, site for emergency tracheostomy.

XII Introduction of early clinical exposure

For example –

1. Upper limb – Erb'spalsy, Klumke's paralysis, claw hand, wrist drop

2. Lower limb – Varicose veins, Trendelenburg's test for gluteus medius, Knee arthroscopy and replacement, foot drop, Flat foot, Femoral hernia.

3. Thorax – pleural effusion, procedure of pleural or pericardial tap, diaphragmatic hernia, X-ray chest with introduction of terms such as CT scan, HRCT, Bronchoscopy. Introduction of echocardiography and valvular movements, Angiography.

4. Abdomen – renal calculi, Meekel's diverticulum, cholecystitis, Introduction to endoscopy of stomach and large intestine and duodenum, Peancreatic and gallstone removal with endoscopy

5. Pelvis – interior of bladder by cystoscopy, ectopic pregnancy, haemorrhoids, Introduction of pelvic laproscopy.

6. Head, face, neck – facial palsy, Parotitis, black eye I scalp injury

7. Neuro-anatomy – Huntington's chorea, Hydrocephaly, Procedure of lumbar puncture. Introduction of MRI and MRI angiography and tensor imaging

SYLLABUS

ANATOMY

TEACHING HOUR

DISTRIBUTION

ANATOMY TEACHING HOURS

Theory	**223**
Practical	**474**
Total	**697**

SYLLABUS & TEACHING HOURS DISTRIBUTION
(1ST Year MBBS-Theory)

Sr. No.	Topic	Theory Hours
1.	General Anatomy	11
2.	Upper Limb	18
3.	Lower Limb	13
4.	HFN	38
5.	Neuro Anatomy	21
6.	Thorax	14
7.	Abdomen & Pelvis	25
8.	Histology	26
9.	Embryology	31
10.	Genetics	6
11.	Seminars	20
	Total	**223**

Sr. No.	Topic	Lecture	LD	Theory Hours
1.	General Anatomy	10	1	11
2.	Upper Limb	13	5	18
3.	Lower Limb	11	2	13
4.	HFN	26	12	38
5.	Neuro Anatomy	18	3	21
6.	Thorax	11	3	14
7.	Abdomen & Pelvis	21	4	25
8.	Histology	26		26
9.	Embryology	31		31
10.	Genetics	6		6
11.	Seminars		20	20
	Total	**172**	**50**	**223**

Sr. No.	Region	Topic	Lect.	LD
1	**General Anatomy**	Introduction to Anatomy	1	
		Terminology	1	
		Bone	1	1
		Joints	1	
		Skin & fascia	1	
		Muscle	1	
		Circulatory System	1	
		Nervous System	1	
		Lymphatic System	1	
		Imaging Techniques	1	
		Total	10	1

Sr. No.	Region	Topic	Lect.	LD
2	**Upper Limb**	Mammary Gland	1	
		Pectoral Region		1
		Pectoral Girdle	1	
		Brachial Plexus	1	
		Back	1	
		Axilla		1
		Intermuscular Spaces & Axillary Nerve	1	
		Shoulder Joint	1	
		Abduction at Shoulder Joint		1
		Venous Drainage of Upper Limb		1
		Compartments of arm and cubital fossa	1	
		Elbow Joint	1	
		Radio-Ulnar Joint	1	
		Anatomical Snuff Box		1
		Muscles & Nerves of Palm	1	
		Palmar Arches		1
		Palmar Spaces	1	
		Median & Ulnar Nerve	1	
		Radial Nerve	1	
		Total	13	6

Sr. No.	Region	Topic	Lect.	LD
3	**Lower Limb**	Venous drainage of lower limb	1	
		Femoral triangle	1	
		Adductor canal & obturator nerve	1	
		Gluteal Region	1	
		Back of Thigh & Sciatic Nerve		1
		Hip joint	1	
		Popliteal fossa	1	
		Knee joint	1	
		Movements of Knee Joints		1
		Compartments of Leg	1	
		Ankle joint	1	
		Subtalar joint	1	
		Arches of foot	1	
		Total	11	2

Sr. No.	Region	Topic	Lect.	LD
4	**Head, Face & Neck**	Scalp	1	
		Face-Muscles, Nerve supply	1	
		Face-Blood supply		1
		Triangles of neck & posterior triangle	1	
		Anterior triangle		1
		Carotid triangle	1	
		Thyroid gland	1	
		Subclavian artery		1
		Cervical sympathetic chain		1
		Functional components of Cranial Nerves	1	
		Cranial Nerve XI in neck		1
		Parotid gland	1	
		Extra cranial VII Nerve	1	
		Infra temporal region & mandibular nerve	1	
		Infra temporal fossa		1
		T M Joint	1	
		Muscles of mastification		1
		Submandibular region & gland	1	
		Hypoglossal nerve	1	
		Styloid apparatus & glossopharyngeal Nerve	1	
		Meninges & dural venous sinuses		1
		Cavernous Sinus	1	
		Pituitary gland	1	
		Peripheral Parasympathetic Ganglia	1	
		Orbit		1
		Extra ocular muscles of eye	1	
		Ophthalmic & maxillary div. of V Cranial Nerve	1	
		Cranial Nerve III & ciliary ganglion	1	
		Cranial Nerve IV & VI	1	
		Joints in Cervical Region		1
		Pharynx	1	
		Palate	1	
		Tongue	1	
		Lateral wall of nose & nasal septum		1
		Paranasal sinuses	1	
		Larynx	1	
		Larynx- Interior		1
		Middle ear	1	
		Total	26	12

Sr. No.	Region	Topic	Lect.	LD
5	**Neuro Anatomy**	Introduction to CNS	1	
		Spinal cord I (Nuclei & tracts)	1	
		Spinal cord External features		1
		Spinal cord II (Blood supply & applied)	1	
		Blood supply of brain	1	
		Medulla I	1	
		Medulla II	1	
		Pons	1	
		Mid brain	1	
		Cerebellum	1	
		IV Ventricle	1	
		Gyri, sulci & functional areas of brain	1	
		White matter of cerebrum & corpus callosum	1	
		Basal ganglia	1	
		Thalamus	1	
		Hypothalamus		1
		Internal capsule	1	
		Lateral ventricle	1	
		III Ventricle	1	
		CSF Circulation		1
		Limbic system	1	
		Total	18	3

Sr. No.	Region	Topic	Lect.	LD
6	**Thorax**	Thoracic cavity	1	
		Intercostal space	1	
		Typical Intercostal Nerve		1
		Pleura	1	
		Broncho pulmonary segments	1	
		Lungs		1
		Mediastinum divisions & Superior Med.	1	
		Pericardium	1	
		Interior of right atrium	1	
		Blood supply of heart	1	
		Respiratory Movements		1
		Thoracic duct	1	
		Esophagus	1	
		Azygous system	1	
		Total	11	3

Sr. No.	Region	Topic	Lect.	LD
7	**Abdomen & Pelvis**	Ant. Abd. Wall	1	
		Rectus sheath		1
		Inguinal canal	1	
		Spermatic cord	1	
		Testis		1
		Peritoneum	1	1
		Lesser sac	1	
		Stomach	1	
		Duodenum	1	
		Portal vein	1	
		Extra hepatic biliary system	1	
		Kidney	1	
		Ureter	1	
		Diaphragm	1	
		Urinary bladder	1	
		Prostate	1	
		Rectum	1	
		Uterus	1	
		Anal canal	1	
		Fallopian tube & ovary	1	
		Perineal pouches	1	
		Ischio rectal fossa	1	
		Pelvic diaphragm	1	
		Internal Iliac Artery		1
		Total	21	4

Sr. No.	Region	Topic	Lect.	LD
8	**Histology (General +Systemic)**	**General**		
		Cells & organelles	1	
		Epithelium	1	
		Connective Tissue	1	
		Cartilage	1	
		Bones	1	
		Muscle	1	
		Nervous System	1	
		Blood vessels	1	
		Lymphoid System	2	
		Skin	1	
		Revision General Histology	1	
		Systemic		
		Tongue & Salivary gland	1	
		Oesophagus & stomach	1	
		Small & Large intestines & appendix	1	
		Accessory organs of digestive system	1	
		Respiratory System	1	
		Urinary system	1	
		Male reproductive system	1	
		Female reproductive system	2	
		Endocrines	1	
		Nervous system	1	
		Eye- retina & cornea	1	
		Revision Systemic Histology	2	
		Total	26	

Sr. No.	Region	Topic	Lect.	LD
9	**Embryology (General +Systemic)**	**General**		
		Cell Division	1	
		Gametogenesis	1	
		Ovarian & Menstrual Cycle	1	
		Fertilization & 1st Wk of Development	1	
		2nd Wk of Development	2	
		3rd wk of Development	2	
		4th wk of Development	1	
		Folding of embryo	1	
		Placenta	2	
		Revision General Embryology	1	
		Systemic		
		GIT	4	
		Respiratory system	1	
		Cardiovascular system	3	
		Urinary system	1	
		Male Reproductive System	2	
		Female Reproductive System	2	
		HFN	3	
		Nervous system	1	
		Revision Systemic Embryology	1	
		Total	31	

Sr. No.	Region	Topic	Lect.	LD
10	**Genetics**	Karyotyping	1	
		Chromosomal abnormalities	1	
		syndromes	1	
		Inheritance	1	
		Genetic Counseling	1	
		Prenatal Diagnosis	1	
		Total	6	

SYLLABUS & TEACHING HOURS DISTRIBUTION
(1ST Year MBBS-Practical)

Sr. No.	Topic	Practical Hours
12.	General Anatomy	2
13.	Upper Limb	41
14.	Lower Limb	38
15.	HFN	69
16.	Neuro Anatomy	21
17.	Thorax	35
18.	Abdomen & Pelvis	75
19.	Histology	52
20.	Embryology	29
21.	Genetics	2
22.	Mid Term Exams	30
23.	Terminal & Prelim Exams	80
	Total	**474**

Sr. No.	Topic	Diss. Hours	Demo Hours	Tut. Hours	Pract. Hours	Exam Hours	Total Practical Hours
1.	General Anatomy		1	1			**2**
2.	Upper Limb	32	7	2			**41**
3.	Lower Limb	28	8	2			**38**
4.	HFN	49	16	4			**69**
5.	Neuro Anatomy	9	10	2			**21**
6.	Thorax	24	10	1			**35**
7.	Abdomen & Pelvis	56	14	5			**75**
8.	Histology				52		**52**
9.	Embryology				29		**29**
10.	Genetics				2		**2**
11.	Mid Term Exams					30	**30**
12.	Terminal & Prelim Exams					80	**80**
	Total	**198**	**66**	**17**	**83**	**110**	**474**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
1	**General Anatomy**	Bones		1	
		Joints			1
		Total		**1**	**1**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
2	**Upper Limb**	Pectoral region	4		1
		Axilla	4		
		Scapular region	4		
		Back	4		
		Arm i. Back	2		
		ii. Front	2		
		Cubital fossa	2		1
		Fore arm i. Front	4		
		ii. Back	2		
		Palm	4		
		Clavicle		1	
		Scapula		1	
		Humerus		1	
		Radius		1	
		Ulna		1	
		Articulated hand		1	
		Radiology & Living Anatomy		1	
		Total	**32**	**7**	**2**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
3	**Lower Limb**	Front of thigh	4		
		Medial compartment	2		
		Gluteal region	6		1
		Back of thigh	2		
		Popliteal fossa	4		1
		Leg - posterior	4		
		Leg – anterior and lateral	2		
		Sole	4		
		Hip bone		2	
		Femur		2	
		Tibia		1	
		Fibula/ Patella		1	
		Articulated foot		1	
		Radiology & Living Anatomy		1	
		Total	**28**	**8**	**2**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
4	**Head, Face & Neck**	Scalp & Face	6		
		Posterior triangle	4		1
		Anterior triangle	6		
		Deep dissection of neck	4		1
		Parotid region	4		
		Temporal & Infra temporal region	6		
		Submandibular region	4		1
		Removal of brain	4		
		Orbit	4		
		Pharynx, palate, tongue & nose	3	4	
		Larynx	4	1	
		Normas Skull		5	1
		Cranial fossa Skull		2	
		Mandible		1	
		Cervical Vertebra		1	
		Foetal skull		1	
		Radiology & Living Anatomy		1	
		Total	**49**	**16**	**4**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
5	**Neuro Anatomy**	Spinal cord	1	1	
		Brain Stem	1	1	1
		Cerebellum		2	
		Cerebrum	3	4	1
		Sections	4	2	
		Total	**9**	**10**	**2**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
6	**Thorax**	Thoracic cavity & Intercostal space	8		
		Lungs	4	1	
		Heart	6	2	1
		Posterior mediastinum	6	1	
		Sternum		1	
		Rib		2	
		Thoracic Vertebra		2	
		Radiology & Living Anatomy		1	
		Total	**24**	**10**	**1**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
7	**Abdomen & Pelvis**	Anterior Abdominal wall Rectus sheath	4		
		Inguinal canal	2		
		Testis and spermatic cord	4		
		Peritoneum	4		
		Liver	2	1	1
		Stomach	2	1	
		Small & Large intestines	2	1	1
		Pancreas	2	1	
		Spleen	2	1	
		Kidney	4	1	1
		Supra renal	2		
		Posterior abdominal wall	6		
		Diaphragm	2		
		Uterus	4	1	1
		Urinary bladder	4	1	
		Perineum	4		
		Male Pelvis	3	1	
		Female Pelvis	3	1	
		Pelvis		1	1
		Lumber vertebra		1	
		Sacrum		1	
		Radiology & Living Anatomy		1	
		Total	**56**	**14**	**5**

Sr. No.	Region	Topic	Practical
8	**Histology (General +Systemic)**	**General**	
		Microscope	2
		Cells & organelles	2
		Epithelium	2
		Connective Tissue	2
		Cartilage	2
		Bones	2
		Muscle	2
		Nervous System	2
		Blood vessels	2
		Lymphoid System	4
		Skin	2
		Revision	2
		Systemic	
		Tongue & Salivary gland	2
		Oesophagus & stomach	2
		Small & Large intestines & appendix	2
		Accessory organs of digestive system	2
		Respiratory System	2
		Urinary system	2
		Male reproductive system	2
		Female reproductive system	4
		Endocrines	2
		Nervous system	2
		Eye- retina & cornea	2
		Revision	2
		Total	**52**

Sr. No.	Region	Topic	Practical
9	Embryology (General +Systemic)	**General**	
		Gametogenesis	1
		Ovarian & Menstrual Cycle	1
		Fertilization & 1st Wk of Development	1
		2nd Wk of Development	2
		3rd wk of Development	2
		4th wk of Development	1
		Folding of embryo	1
		Placenta	2
		Revision	2
		Systemic	
		GIT	4
		Respiratory system	1
		Cardiovascular system	3
		Urinary system	1
		Male Reproductive System	1
		Female Reproductive System	1
		HFN	3
		Revision	2
		Total	**29**

Sr. No.	Region	Topic	Practical
10	Genetics	Karyotyping	1
		Chromosomal abnormalities	1
		Total	**2**

Books for Anatomy

	Sections	Title	Authors	Edition
A	**General Anatomy**			
	1	Handbook of General Anatomy	B.D.Chaurasia	5th edition
	2	General Anatomy	Vishram Singh	2nd edition
B	**Gross Anatomy**			
	1	Textbook of Anatomy Vol –I,II,III	Vishram Singh	2nd edition
	2	Human Anatomy Vol –I,II,III	B.D.Chaurasia	7th edition
C	**Dissector**			
	1	Thieme dissector Vol –I,II,III	Vishram Singh	1st edition
D	**Histology**			
	1	Histology text and atlas	Brijesh kumar	1st edition
	2	Textbook of histology	Krishna Garg	5th edition
	For reference 3	Atlas of histology	di Fiore's	12th edition
	For reference 4	Functional histology	Wheaters	5th edition
E	**Embryology**			
	1	Human Embryology	B.D.Chaurasia	2nd edition
	2	Clinical Embryology	Vishram Singh	2012 reprint
	For reference 3	Medical Embryology	Langman's	11th edition
F	**Neuroanatomy**			
	1	Textbook of clinical Neuroanatomy	Vishram Singh	2nd edition
G	**Genetics**			
	1	Medical Genetics	G P Pal	2st edition
	2	Human Genetics	S D Gangane	4th edition

Reference Books

Sr. No.	Anatomy	Author	Edition
1.	Gray's Anatomy		41st
2.	Clinical Anatomy by Regions	R. Snell	9th
3.	Last's Anatomy (Regional and Applied)	Slnnatamby	12th
4.	Functional Histology (A Text and Atlas)	Wheater's	6th
5.	Basic Histology Text and Atlas	Junqueira	13th
6.	The Developing Human	Keith Moore	9th
7.	Functional Neuroanatomy (Text and Atlas)	Afifi	2nd
8.	Medical Genetics	Jorde	4th
9.	Genetics in Medicine	Thompson & Thompson	8th

EXAMINATION PATTERN

Internal Exams (Terminal + Preliminary)

THEORY -

	Terminal	Preliminary		University	
Total Marks	60	50	50	50	50
Durations	2.30 hrs.	2.30 hrs.	2.30 hrs.	2.30 hrs.	2.30 hrs.
Paper	**Only one paper**	**Paper I**	**Paper II**	**Paper I**	**Paper II**
Section A	MCQ – Sec-A 20 X 0.5 = 10 Marks	MCQ - Sec-A 20 X 0.5 = 10 Marks	MCQ - Sec-A 20 X 0.5 = 10 Marks	MCQ - Sec-A 20 X 0.5 = 10 Marks	MCQ - Sec-A 20 X 0.5 = 10 Marks
Section B	SAQ - Sec-B 6 out of 7 6 X 5 = 30 Marks	SAQ - Sec-B 4 out of 5 4 X 5= 20 Marks	SAQ - Sec-B 4 out of 5 4 X 5= 20 Marks	SAQ - Sec-B 4 out of 5 4 X 5= 20 Marks	SAQ - Sec-B 4 out of 5 4 X 5= 20 Marks
Section C	LAQ – Sec-C 2 out of 3 10 X 2 = 20 Marks	LAQ – Sec-C 2 out of 3 10 X 2 = 20 Marks	LAQ – Sec-C 2 out of 3 10 X 2 = 20 Marks	LAQ – Sec-C 2 out of 3 10 X 2 = 20 Marks	LAQ – Sec-C 2 out of 3 10 X 2 = 20 Marks

PRACTICAL EXAMINATION (TERMINAL)

	Histology Spots (6 x 1 = 6 Marks)	Slide Discussion (1 X 4 = 4 Marks)	Soft Part	Radio	Living Anatomy	Viva*			Total
						Ax Sk	Ap Sk	& Emb	
Marks	6	4	20	5	5	7	8	5	60

PRACTICAL EXAMINATION (PRELIMINARY & UNIVERSITY)

	Soft part above diaphragm	Soft part below diaphragm	Radio-logy	Living anatomy	Histology spots 8 X 0.5 = 4 Marks	Histology Slide Discussion 2 X 3 = 6 Marks	Viva *				Total
							Ax Sk	Ap Sk	Emb	Gene-tics	
Marks	10	10	5	5	4	6	5	8	5	2	60

Note:* 20 practical viva marks to be added along with this.

Internal Assessment of Anatomy

	Theory	Practical
Terminal & Prelim exams	15	15
Day to day assessment as per MCI	05	05
Total	**20**	**20**

Date -_____

Model University Examination Question Paper

I M.B.S.S. Anatomy Examination

Paper I

Section :- A

Q. 1. Multiple Choice Questions (20 X 0. 5= 10 Marks)

1. What type of joint is interphalangeal joint ?
   a) Ellipsoid b) Hinge
   c) Pivot d) Saddle

2. Which one of the following is the action of Brachialis on Elbow joint ?
   a) Flexion b) Adduction
   c) Medial Rotation d) Abduction

3. Which one of the following nerves supplies radial lumbricals ?
   a. Ulnar b) Median
   c. Radial d) Posterior interosseous

4. Which one of the following nerves is injured in case of winging of scapula ?
   a. Lower subscapular nerve b) Long thoracic nerve
   c. Dorsal Scapular nerve d) Upper subscapular nerve

5. Which one of the following muscle is a medial rotator and adductor of arm ?
   a) Subscapularis b) Teres minor
   c) Supraspinatus d) Infraspinatus

6. Which one of the following muscle is the tensor of the vocal cord ?
   a) Cricoarytenoids b) Cricothyroid
   c) Thyroarytenoids d) Transverse arytenoids

7. Which one of the following sinuses does not open in middle meatus ?
   a) Middle ethmoidal b) Anterior ethmoidal
   c) Posterior ethmoidal d) Maxillary

8. Which one of the following venous sinuses is an unpaired sinus ?
   a) Sigmoid sinus b) Transverse sinus
   c) Cavernous sinus d) Occipital sinus

9. Which one of the following muscles causes depression of eyeball ?
   1. Lateral Rectus b) Transverse sinus
   c) Inferior Oblique d) Superior Oblique

10. Which one of the following is the root value of Ulnar nerve ?
    a. C7, C8, T1 b. C8, T1
    c. C5, C6, C7 d. C5, C6

11. Which one of the following pouch contributes to form tonsil ?
    a. 2^{nd} b. 3^{rd}
    c. 1^{st} d. 4^{th}

12. Medical Medullary syndrome is seen because of injury to which artery ?
    a. Posterior spinal artery d. Anterior spinal artery
    c. Basilar artery d. PICA

13. Anterior inferior cerebellar artery is a branch of which artery ?
    a. Superior cerebellar d. Vertebral
    c. Operculated d. Limiting

14. What type of sulcus is central sulcus ?
    a. Axial b. Complete
    c. Operculated d. Limiting

15. Which muscle causes opening of mouth ?
    a. Medical Pterygoid b. Temporalis
    c. Lateral Pterygoid d. Masseter

16. Which one of the following is motor speech are ?
    a. area 3,1 b. area 44, 45
    c. area 37 c. area 42

17. Which one of the following structure give rise to cornea ?
    a. Surface ectoderm b. neuro ectoderm
    c. Neural crest cells d. notochord

18. What is the epithelium of tongue ?
    a. Non keratinized stratified squamous b. keratinized stratified squamous
    c. Simple squamous d. Simple columnar

19. Which one of the following type of neuron is seen in dorsal root ganglion ?
    a. Pseudounipolar b. Unipolar
    c. Biopolar d. Multipolar

20. Membrana tectoria is a continuation of which one of the following structures ?
    a. Posterior atlanto-occipital membrane b. Posterior longitudinal ligament
    c. Anterior longitudinal ligament d. Anterior atlanto-occipital membrane

Date -_____

Model University Examination Question Paper
I M.B.S.S. Anatomy Examination
Paper I

SECTION A

MCQ (10 Marks)

SECTION B

Q. 1 Short answering question (4 out of 5) – (4 X 5 = 20 Marks)

1. Muscles of mastication
2. Pectoris major muscle
3. Microscopic structure of cornea
4. Primary motor area
5. Nerve supply of tongue with embryological basis

SECTION C

Q. 1 Long answering question (2 out of 3) - (2 X 10 = 20 Marks)

1. Describe Brachial Plexus under following headings
   a. Formation (4 Marks)
   b. Branches (3 Marks)
   c. Applied aspect (3 Marks)

2. Describe Cerebellum under following headings.
   a. Gross Anatomy (2 Marks)
   b. Blood supply (3 Marks)
   c. Connections and structures passing through it (4 Marks)
   d. Applied (1 Mark)

3. Describe Parotid Gland under following headings
   a. Gross Anatomy (3 Marks)
   b. Relations (3 Marks)
   c. Microscopic structure (2 Marks)
   d. Applied aspect (2 Marks)

Date-_____

Model University Examination Question Paper

I M.B.S.S. Anatomy Examination

Paper II

Section :- A

MCQs (20 X 0. 5= 10 Marks)

1. Which one is not the content of the middle mediastinum ?
   a. Heart with pericardium
   b. Pulmonary arteries
   c. Lower half of superior vena cava
   d. Bifurcation of trachea

2. Which one of the following ribs articulates with one vertebra only ?
   a. 1^{st}
   b. 2^{nd}
   c. 3^{rd}
   d. 4^{th}

3. Inguinal ligament is a thickening of which structure ?
   a. Aponeurosis of external oblique
   b. Aponeurosis of internal oblique
   c. Deep fascial of thigh
   d. Superficial fascia of thing

4. Which muscle is not supplied by obturator nerve ?
   a. Pectineus
   b. Adductor longus
   c. Adductor brevis
   d. Semimembranosus

5. Dorsalis pedis artery is a continuation of which artery ?
   a. Popliteal artery
   b. Anterior tibial artery
   c. Malleolar artery
   d. Posterior tibial artery

6. Inversion is caused by which muscle ?
   a. Tibialis anterior
   b. Peroneus longus
   c. Extensor digitorum longus
   d. Flexor digitorum

7. Which is not the content of recus sheath ?
   a. Rectus abdominis muscle
   b. Superior epigastric artery
   c. Ilioinguinal nerve
   d. Inferior epigastric vein

8. Which is the unpaired branch of aorta ?
   a. Inferior phrenic artery
   b. Renal artery
   c. Middle suprarenal artery
   d. Coeliac trunk

9. Which structure is not crossed by pelvic part of the ureter ?
   a. External iliac vessels
   b. Psoas major muscle
   c. Middle suprarenal artery
   d. Obturator artery

10. Left ovarian vein opens in which vein ?
    a. External iliac vein
    b. Internal iliac vein
    c. Left renal vein
    d. Inferior vena cava

11. Which part of the bone is ossified from primary centre ?
    a. Epiphysis
    b. Diaphysis

c. Metaphysis
d. Epiphyseal cartilage

12. Which is multipennate muscle ?
    a. Interossei
    b. Reotus femoris
    c. Deltoid
    d. Tibialis anterior

13. Presence of an arteiod in lymphoid tissue is seen in which tissue ?
    a. Spleen
    b. Lymph node
    c. Thymus
    d. Tonsil

14. Chromosome number 3 is which type of chromosome ?
    a. Metacentric
    b. Submetacentric
    c. Acrocentric
    d. Acrocentric with satellite

15. Smooth part of the right atrium is derives from which part ?
    a. Right horn of sinus venosus
    b. Primitive atrial chamber
    c. Left horn of sinus venosus
    d. Bulbus cordis

16. What is the remnant of urachus ?
    a. Medican umbilical ligament
    b. Medial umbilical ligament
    c. Lateral umbilical ligament
    d. Medical fold

17. Aorta is an example of which artery ?
    a. Small muscular artery
    b. End artery
    c. Large elastic artery
    d. none of the above

18. Pancreases is derived from which gut ?
    a. Forgut
    b. Midgut
    c. Hindgut
    d. Mesogastrium

19. What is the epithelium of appendix ?
    a. Simple cuboidal
    b. Simple columnar
    c. Stratified columnar
    d. Simple Sqamous

20. Submucosa is the absent in which structure ?
    a. Esophagus
    d. Ilieum
    c. Large intestine
    d. Gall bladder

Date -_____

Model University Examination Question Paper
I M.B.S.S. Anatomy Examination
Paper II

SECTION A

MCQ (20 X 0.5 = 10 Marks)

SECTION B

Q. 1 Short answering question (4 out of 5) – (4 X 5 =20 Marks)

1. Supports of Uterus
2. Microscopic structure of Bone
3. Development of Pancreas
4. Down Syndrome
5. Oogenesis

SECTION C

Q. 1 Long answering question (2 out of 3) - (2 X 10 = 20 Marks)

1. Describe Knee Joit under following headings
   a. Type and bones articulating (2 Marks)
   b. Ligaments (3 Marks)
   c. Movements and muscles causing movement (4 Marks)
   d. Applied aspects (1 Mark)

2. Describe second part of Duodenum under following headings.
   a. Gross Anatomy (2 Marks)
   b. Blood supply (2 Marks)
   c. Relations (2 Marks)
   d. Microscopic structure (2 Marks)
   e. Applied aspects (1 Mark)

3. Describe Respiratory movements in detail with applied aspect

TOPICS FOR HORIZONTAL INTEGRATION IN I-MBBS

(Anatomy, Physiology, Biochemistry)

Sr. No.	Month	Name of the Topic	Anatomy	Physiology	Biochemistry
1.		Thyroid disorders			
2.		Coronary artery disease			
3.		Stroke			
4.		Renal stones			
5.		Diabetes			
6.		Pneumonia			
7.		Ulcerative colitis			
8.		Benign prostatic hypertrophy			
9.		Atonic bladder			
10.		Endometriosis			

ANATOMY TEACHING HOURS

Theory	**222**
Practical	**474**
Total	**696**

SYLLABUS & TEACHING HOURS DISTRIBUTION
(1ST Year MBBS-Theory)

Sr. No.	Topic	Theory Hours
24.	General Anatomy	11
25.	Upper Limb	18
26.	Lower Limb	13
27.	HFN	38
28.	Neuro Anatomy	20
29.	Thorax	14
30.	Abdomen & Pelvis	25
31.	Histology	26
32.	Embryology	31
33.	Genetics	6
34.	Seminars	20
	Total	**222**

Sr. No.	Topic	Lecture	LD	Theory Hours
12.	General Anatomy	10	1	11
13.	Upper Limb	13	5	18
14.	Lower Limb	11	2	13
15.	HFN	26	12	38
16.	Neuro Anatomy	17	3	20
17.	Thorax	11	3	14
18.	Abdomen & Pelvis	21	4	25
19.	Histology	26		26
20.	Embryology	31		31
21.	Genetics	6		6
22.	Seminars		20	20
	Total	**172**	**50**	**222**

Sr. No.	Region	Topic	Lect.	LD
1	**General Anatomy**	Introduction to Anatomy	1	
		Terminology	1	
		Bone	1	1
		Joints	1	
		Skin & fascia	1	
		Muscle	1	
		Circulatory System	1	
		Nervous System	1	
		Lymphatic System	1	
		Imaging Techniques	1	
		Total	10	1

Sr. No.	Region	Topic	Lect.	LD
2	**Upper Limb**	Mammary Gland	1	
		Pectoral Region		1
		Pectoral Girdle	1	
		Brachial Plexus	1	
		Back	1	
		Axilla		1
		Intermuscular Spaces & Axillary Nerve	1	
		Shoulder Joint	1	
		Abduction at Shoulder Joint		1
		Venous Drainage of Upper Limb		1
		Compartments of arm and cubital fossa	1	
		Elbow Joint	1	
		Radio-Ulnar Joint	1	
		Anatomical Snuff Box		1
		Muscles & Nerves of Palm	1	
		Palmar Arches		1
		Palmar Spaces	1	
		Median & Ulnar Nerve	1	
		Radial Nerve	1	
		Total	13	6

Sr. No.	Region	Topic	Lect.	LD
3	**Lower Limb**	Venous drainage of lower limb	1	
		Femoral triangle	1	
		Adductor canal & obturator nerve	1	
		Gluteal Region	1	
		Back of Thigh & Sciatic Nerve		1
		Hip joint	1	
		Popliteal fossa	1	
		Knee joint	1	
		Movements of Knee Joints		1
		Compartments of Leg	1	
		Ankle joint	1	
		Subtalar joint	1	
		Arches of foot	1	
		Total	11	2

Sr. No.	Region	Topic	Lect.	LD
4	**Head, Face & Neck**	Scalp	1	
		Face-Muscles, Nerve supply	1	
		Face-Blood supply		1
		Triangles of neck & posterior triangle	1	
		Anterior triangle		1
		Carotid triangle	1	
		Thyroid gland	1	
		Subclavian artery		1
		Cervical sympathetic chain		1
		Functional components of Cranial Nerves	1	
		Cranial Nerve XI in neck		1
		Parotid gland	1	
		Extra cranial VII Nerve	1	
		Infra temporal region & mandibular nerve	1	
		Infra temporal fossa		1
		T M Joint	1	
		Muscles of mastification		1
		Submandibular region & gland	1	
		Hypoglossal nerve	1	
		Styloid apparatus & glossopharyngeal Nerve	1	
		Meninges & dural venous sinuses		1
		Cavernous Sinus	1	
		Pituitary gland	1	
		Peripheral Parasympathetic Ganglia	1	
		Orbit		1
		Extra ocular muscles of eye	1	
		Ophthalmic & maxillary div. of V Cranial Nerve	1	
		Cranial Nerve III & ciliary ganglion	1	
		Cranial Nerve IV & VI	1	
		Joints in Cervical Region		1
		Pharynx	1	
		Palate	1	
		Tongue	1	
		Lateral wall of nose & nasal septum		1
		Paranasal sinuses	1	
		Larynx	1	
		Larynx- Interior		1
		Middle ear	1	
		Total	26	12

Sr. No.	Region	Topic	Lect.	LD
5	**Neuro Anatomy**	Introduction to CNS	1	
		Spinal cord I (Nuclei & tracts)	1	
		Spinal cord External features		1
		Spinal cord II (Blood supply & applied)	1	
		Blood supply of brain	1	
		Medulla I	1	
		Medulla II	1	
		Pons	1	
		Mid brain	1	
		Cerebellum	1	
		IV Ventricle	1	
		Gyri, sulci & functional areas of brain	1	
		White matter of cerebrum & corpus callosum	1	
		Basal ganglia	1	
		Thalamus	1	
		Hypothalamus		1
		Internal capsule	1	
		Lateral ventricle	1	
		III Ventricle	1	
		CSF Circulation		1
		Total	17	3

Sr. No.	Region	Topic	Lect.	LD
6	**Thorax**	Thoracic cavity	1	
		Intercostal space	1	
		Typical Intercostal Nerve		1
		Pleura	1	
		Broncho pulmonary segments	1	
		Lungs		1
		Mediastinum divisions & Superior Med.	1	
		Pericardium	1	
		Interior of right atrium	1	
		Blood supply of heart	1	
		Respiratory Movements		1
		Thoracic duct	1	
		Esophagus	1	
		Azygous system	1	
		Total	11	3

Sr. No.	Region	Topic	Lect.	LD
7	**Abdomen & Pelvis**	Ant. Abd. Wall	1	
		Rectus sheath		1
		Inguinal canal	1	
		Spermatic cord	1	
		Testis		1
		Peritoneum	1	1
		Lesser sac	1	
		Stomach	1	
		Duodenum	1	
		Portal vein	1	
		Extra hepatic biliary system	1	
		Kidney	1	
		Ureter	1	
		Diaphragm	1	
		Urinary bladder	1	
		Prostate	1	
		Rectum	1	
		Uterus	1	
		Anal canal	1	
		Fallopian tube & ovary	1	
		Perineal pouches	1	
		Ischio rectal fossa	1	
		Pelvic diaphragm	1	
		Internal Iliac Artery		1
		Total	21	4

Sr. No.	Region	Topic	Lect.	LD
8	**Histology (General +Systemic)**	**General**		
		Cells & organelles	1	
		Epithelium	1	
		Connective Tissue	1	
		Cartilage	1	
		Bones	1	
		Muscle	1	
		Nervous System	1	
		Blood vessels	1	
		Lymphoid System	2	
		Skin	1	
		Revision General Histology	1	
		Systemic		
		Tongue & Salivary gland	1	
		Oesophagus & stomach	1	
		Small & Large intestines & appendix	1	
		Accessory organs of digestive system	1	
		Respiratory System	1	
		Urinary system	1	
		Male reproductive system	1	
		Female reproductive system	2	
		Endocrines	1	
		Nervous system	1	
		Eye- retina & cornea	1	
		Revision Systemic Histology	2	
		Total	26	

Sr. No.	Region	Topic	Lect.	LD
9	**Embryology (General +Systemic)**	**General**		
		Cell Division	1	
		Gametogenesis	1	
		Ovarian & Menstrual Cycle	1	
		Fertilization & 1st Wk of Development	1	
		2nd Wk of Development	2	
		3rd wk of Development	2	
		4th wk of Development	1	
		Folding of embryo	1	
		Placenta	2	
		Revision General Embryology	1	
		Systemic		
		GIT	4	
		Respiratory system	1	
		Cardiovascular system	3	
		Urinary system	1	
		Male Reproductive System	2	
		Female Reproductive System	2	
		HFN	3	
		Nervous system	1	
		Revision Systemic Embryology	1	
		Total	31	

Sr. No.	Region	Topic	Lect.	LD
10	**Genetics**	Karyotyping	1	
		Chromosomal abnormalities	1	
		syndromes	1	
		Inheritance	1	
		Genetic Counseling	1	
		Prenatal Diagnosis	1	
		Total	6	

SYLLABUS & TEACHING HOURS DISTRIBUTION
(1ST Year MBBS-Practical)

Sr. No.	Topic	Practical Hours
35.	General Anatomy	2
36.	Upper Limb	41
37.	Lower Limb	38
38.	HFN	69
39.	Neuro Anatomy	21
40.	Thorax	35
41.	Abdomen & Pelvis	75
42.	Histology	52
43.	Embryology	29
44.	Genetics	2
45.	Mid Term Exams	30
46.	Terminal & Prelim Exams	80
	Total	**474**

Sr. No.	Topic	Diss. Hours	Demo Hours	Tut. Hours	Pract. Hours	Exam Hours	Total Practical Hours
13.	General Anatomy		1	1			**2**
14.	Upper Limb	32	7	2			**41**
15.	Lower Limb	28	8	2			**38**
16.	HFN	49	16	4			**69**
17.	Neuro Anatomy	9	10	2			**21**
18.	Thorax	24	10	1			**35**
19.	Abdomen & Pelvis	56	14	5			**75**
20.	Histology				52		**52**
21.	Embryology				29		**29**
22.	Genetics				2		**2**
23.	Mid Term Exams					30	**30**
24.	Terminal & Prelim Exams					80	**80**
	Total	**198**	**66**	**17**	**83**	**110**	**474**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
1	**General Anatomy**	Bones		1	
		Joints			1
		Total		**1**	**1**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
2	**Upper Limb**	Pectoral region	4		1
		Axilla	4		
		Scapular region	4		
		Back	4		
		Arm i. Back	2		
		ii. Front	2		
		Cubital fossa	2		1
		Fore arm i. Front	4		
		ii. Back	2		
		Palm	4		
		Clavicle		1	
		Scapula		1	
		Humerus		1	
		Radius		1	
		Ulna		1	
		Articulated hand		1	
		Radiology & Living Anatomy		1	
		Total	**32**	**7**	**2**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
3	**Lower Limb**	Front of thigh	4		
		Medial compartment	2		
		Gluteal region	6		1
		Back of thigh	2		
		Popliteal fossa	4		1
		Leg - posterior	4		
		Leg – anterior and lateral	2		
		Sole	4		
		Hip bone		2	
		Femur		2	
		Tibia		1	
		Fibula/ Patella		1	
		Articulated foot		1	
		Radiology & Living Anatomy		1	
		Total	**28**	**8**	**2**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
4	**Head, Face & Neck**	Scalp & Face	6		
		Posterior triangle	4		1
		Anterior triangle	6		
		Deep dissection of neck	4		1
		Parotid region	4		
		Temporal & Infra temporal region	6		
		Submandibular region	4		1
		Removal of brain	4		
		Orbit	4		
		Pharynx, palate, tongue & nose	3	4	
		Larynx	4	1	
		Normas Skull		5	1
		Cranial fossa Skull		2	
		Mandible		1	
		Cervical Vertebra		1	
		Foetal skull		1	
		Radiology & Living Anatomy		1	
		Total	**49**	**16**	**4**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
5	**Neuro Anatomy**	Spinal cord	1	1	
		Brain Stem	1	1	1
		Cerebellum		2	
		Cerebrum	3	4	1
		Sections	4	2	
		Total	**9**	**10**	**2**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
6	**Thorax**	Thoracic cavity & Intercostal space	8		
		Lungs	4	1	
		Heart	6	2	1
		Posterior mediastinum	6	1	
		Sternum		1	
		Rib		2	
		Thoracic Vertebra		2	
		Radiology & Living Anatomy		1	
		Total	**24**	**10**	**1**

Sr. No.	Region	Topic	Diss.	Demo	Tut.
7	**Abdomen & Pelvis**	Anterior Abdominal wall Rectus sheath	4		
		Inguinal canal	2		
		Testis and spermatic cord	4		
		Peritoneum	4		
		Liver	2	1	1
		Stomach	2	1	
		Small & Large intestines	2	1	1
		Pancreas	2	1	
		Spleen	2	1	
		Kidney	4	1	1
		Supra renal	2		
		Posterior abdominal wall	6		
		Diaphragm	2		
		Uterus	4	1	1
		Urinary bladder	4	1	
		Perineum	4		
		Male Pelvis	3	1	
		Female Pelvis	3	1	
		Pelvis		1	1
		Lumber vertebra		1	
		Sacrum		1	
		Radiology & Living Anatomy		1	
		Total	**56**	**14**	**5**

Sr. No.	Region	Topic	Practical
8	**Histology (General +Systemic)**	**General**	
		Microscope	2
		Cells & organelles	2
		Epithelium	2
		Connective Tissue	2
		Cartilage	2
		Bones	2
		Muscle	2
		Nervous System	2
		Blood vessels	2
		Lymphoid System	4
		Skin	2
		Revision	2
		Systemic	
		Tongue & Salivary gland	2
		Oesophagus & stomach	2
		Small & Large intestines & appendix	2
		Accessory organs of digestive system	2
		Respiratory System	2
		Urinary system	2
		Male reproductive system	2
		Female reproductive system	4
		Endocrines	2
		Nervous system	2
		Eye- retina & cornea	2
		Revision	2
		Total	**52**

Sr. No.	Region	Topic	Practical
9	Embryology (General +Systemic)	**General**	
		Gametogenesis	1
		Ovarian & Menstrual Cycle	1
		Fertilization & 1st Wk of Development	1
		2nd Wk of Development	2
		3rd wk of Development	2
		4th wk of Development	1
		Folding of embryo	1
		Placenta	2
		Revision	2
		Systemic	
		GIT	4
		Respiratory system	1
		Cardiovascular system	3
		Urinary system	1
		Male Reproductive System	1
		Female Reproductive System	1
		HFN	3
		Revision	2
		Total	**29**

Sr. No.	Region	Topic	Practical
10	**Genetics**	Karyotyping	1
		Chromosomal abnormalities	1
		Total	**2**

Registrar

From: Aruna Mukherjee [arunamukherjee123456@gmail.com]
Sent: 15 January 2016 13:31
To: registrar@mgmuhs.com; Lalita Chavan
Subject: Pattern of Examination & Internal Assessment - Distribution of Marks
Attachments: Pattern of Examination.docx

A Cell
16/1/16.

DEPARTMENT OF ANATOMY
MGM MEDICAL COLLEGE KAMOTHE, NAVI MUMABI

Date: 15.1.2016

Pattern of Examination

Preliminary + University Examination

Theory – 120 Marks	**Practical – 40 Marks**
Paper I - 50 Marks	Soft Part – 20 Marks
Paper II - 50 Marks	Radio + Living = 10 Marks
50 Marks + 50 Marks + Viva (20 Marks = 120)	Histology Spotting = 6 Marks
Section A – MCQs - Total (20X0.5=10 Marks)	Histology Slide Discussion = 4 Marks
Section B – SAQs - Total (4X5=20 Marks)	**Viva – 20 Marks** **Appendicular = 6 Marks** **Axial Skeleton = 7 Marks** **Embryology = 7 Marks**
Section C – LAQs - Total (2X10=20 Marks)	

Internal Assessment Distribution of Marks

Theory – 20 Marks		**Practical – 20 Marks**	
Terminal Examination	5	Terminal Examination	5
Preliminary Examination	5	Preliminary Examination	5
Attendance	5	Attendance	5
Seminars	5	Journals	5
Total	**20**	**Total**	**20**

Resolution passed in BOM – 48/2017, dated 24/01/2017

Item No. 5.6: BOS (Preclinical) dated 20.09.2016

a) About **Internal assessment examination pattern Anatomy, Physiology and Biochemistry**.

Resolution No. 5.6(a): It was resolved to abide by the existing **Internal assessment examination pattern of Anatomy, Physiology and Biochemistry in 1st MBBS** with regards to distribution of marks and pattern in concurrence with rules of MCI & MGMIHS.

b) **Internal Assessment pattern – First MBBS**

Resolution No. 5.6(b): It was resolved that the actual modality to calculate day to day assessment component of internal assessment in MBBS subjects is to be decided by the respective department heads with keeping all the records for verification in future.

c) About inclusion of Bioethics in MBBS (UG) curriculum.

d) About inclusion of Bioethics in PG curriculum and research.

For both above items' following resolution was adopted:

Resolution No. 5.6(c): It was resolved to send the material received by University from UNESCO chair, Bioethics to Dean Faculty (Aurangabad and Navi Mumbai) and Chairpersons of BOS for their perusal and appropriate inputs to be put forth in next BOS meeting for discussion. [Annexure-II & III of BOM-48/2017]

1st Year - MBBS 8 copies

Resolution No. 1.3.7.1 of BOM-51/2017: Resolved to continue the current Internal Assessment pattern for MBBS (i.e. 5 marks for Day-to-day assessment) for Pre and Para Clinical subjects (Anatomy, Physiology, Biochemistry, Microbiology, Pharmacology, Pathology and FMT).
For rest of the subjects, Internal Assessment is to be calculated from terminal/Post end exam marks and Prelims examination, with immediate effect.

1st MBBS

Anatomy

Resolution No. 1.3.7.3 of BOM-51/2017: Approved to include Bioethics in First MBBS curriculum with three Lectures (1 hr each) per subject of Anatomy, Physiology and Biochemistry with topics: (with effective from Academic year 2017-18)

1) Anatomy –
    1) Cadaveric oath
    2) Genetic counseling
    3) Biomedical waste disposal

1st MBBS, Anatomy

Resolution No. 3.5.2 of BOM-52/2018: It was resolved to conduct Bioethics as lecture schedule in MBBS in Anatomy, Physiology, Biochemistry with topics & time table as mentioned below, with effect from batch admitted in 2017-18 onwards–

1) Anatomy –
   1) Cadaveric oath (September)
   2) Genetic counseling (April)
   3) Biomedical waste disposal (December)

Resolution No. 4.5.1.2 of BOM-55/2018: Resolved that the internal assessment for 1st M.B.B.S. will be calculated as per the table below from 2018-19 onwards. Further Departments should maintain record of Internal Assessment:

Theory: (20 Marks)

	I Terminal & Prelim	4 Periodicals	PBL	Seminar
Existing	15	3		2
Revised	10	5	5 PBL/Seminar/case studies/any other as per dept.	

Practical: 20 marks

	I Terminal & Prelim	4 Periodicals	OSPE	Journal
Existing	15	3		2
Revised	10	5	5 Journal/OSPE/any other method as per dept.	

Resolution No. 4.5.1.3 of BOM-55/2018: Resolved to accept specific mark distribution in MCQ (Section A) in 1st MBBS – Anatomy, Physiology & Biochemistry. To be implemented from 2018-19 onwards. **[Annexure-30-A,B,C]**

Annexure C - 30 - (A)

Annexure C – 1

SPECIFIC MARK DISTRIBUTION IN MCQ PAPER IN I MBBS ANATOMY

Paper I

Sr. No.	Topic	No. of Questions
1.	Upper Limb	4
2.	Thorax	4
3.	Systemic Histology	2
4.	Systemic Embryology	2
5.	Head, Face & Neck	4
6.	Neuroanatomy	4
Total		**20**

Paper II

Sr. No.	Topic	No. of Questions
1.	Lower Limb	4
2.	Abdomen	4
3.	Pelvis	4
4.	Systemic Histology	2
5.	Systemic Embryology	1
6.	General Histology	1
7.	General Embryology	2
8.	General Anatomy	1
9.	Genetics	1
Total		**20**

10 % of MCQ marks should be from clinically based questions

Annexure - 30 (B)

Annexure C – 2

SPECIFIC MARK DISTRIBUTION IN MCQ PAPER IN I MBBS PHYSIOLOGY

Paper I

Sr. No.	Topic	No. of Questions
7.	General physiology	2
8.	Cardiovascular System	4
9.	Respiratory System	4
10.	Blood	4
11.	Endocrine	4
12.	Reproduction	2
Total		**20**

Paper II

Sr. No.	Topic	No. of Questions
10.	Nerve-Muscle Physiology	3
11.	Digestive System	4
12.	Renal System	4
13.	CNS	6
14.	Special Sense	3
Total		**20**

10 % of MCQ marks should be from clinically based questions

Item No. - 7

DEPARTMENT OF BIOCHEMISTRY

Annexure C-3

Distribution of MCQ's

Paper-I

Annexure - 30 (C)

Sr. No.	Topic	MCQs (20)	Marks (10)
1	Molecular and functional organization of a cell and its sub-cellular components	01	0.5
2	Chemistry of enzymes and their clinical applications.	03	1.5
3	Chemistry and metabolism of proteins and related disorders.	02	01
4	Chemistry and metabolism of purines and pyrimidines and related disorders.	02	01
5	Chemistry and functions of DNA and RNA , Genetic code ; Protein biosynthesis &.regulation (Lac-operon)	03	1.5
6	The principles of genetic engineering and their applications in medicine.	02	01
7	Chemistry and Metabolism of hemoglobin.	02	01
8	Biological oxidation.	01	0.5
9	Molecular concept of body defense and their applications in medicine.	01	0.5
10	Vitamins	02	01
11	Nutrition	01	0.5

Paper-II

Sr. No.	Topic	MCQs	Marks
1	Chemistry and metabolism of carbohydrates and related disorders.	02	01
2	Chemistry and metabolism of lipids and related disorders.	02	01
3	Mineral metabolism	02	01
4	Water and electrolyte balance & imbalance.	01	0.5
5	Acid base balance and imbalance.	01	0.5
6	Integration of various aspects of metabolism and their regulatory pathways.	01	0.5
7	Starvation metabolism	01	0.5
8	Mechanism of hormone action.	01	0.5
9	Environmental biochemistry.	01	0.5
10	Liver function tests, Kidney function tests, Thyroid function tests.	03	1.5
11	Detoxification mechanisms.	01	0.5
12	Biochemical basis of cancer and carcinogenesis.	01	0.5
13	Radioisotopes.	01	0.5
14	Investigation techniques : (LCD-Topics) First Aid in Biochemistry laboratory, Colorimeter, Electrophoresis, pH meter, Chromatography, Flame photometer, Lipid profile, Immunoassay techniques	02	01

Received 19/11/18

I/C Head
Dept. of Biochemistry

Professor & Head
Department of Biochemistry,
MGM Medical College,
Kamothe, Navi Mumbai

BOS Member