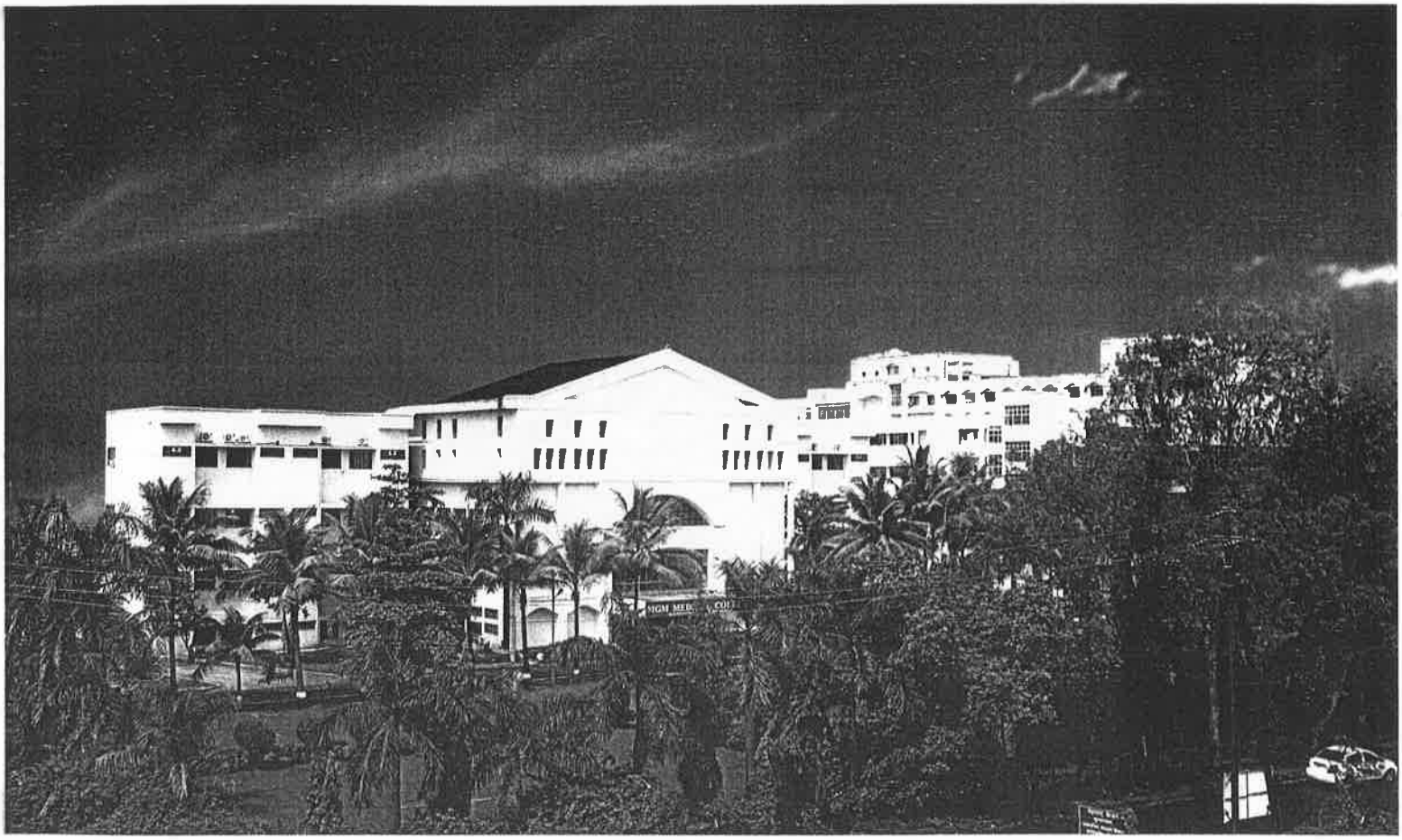
Curriculum for

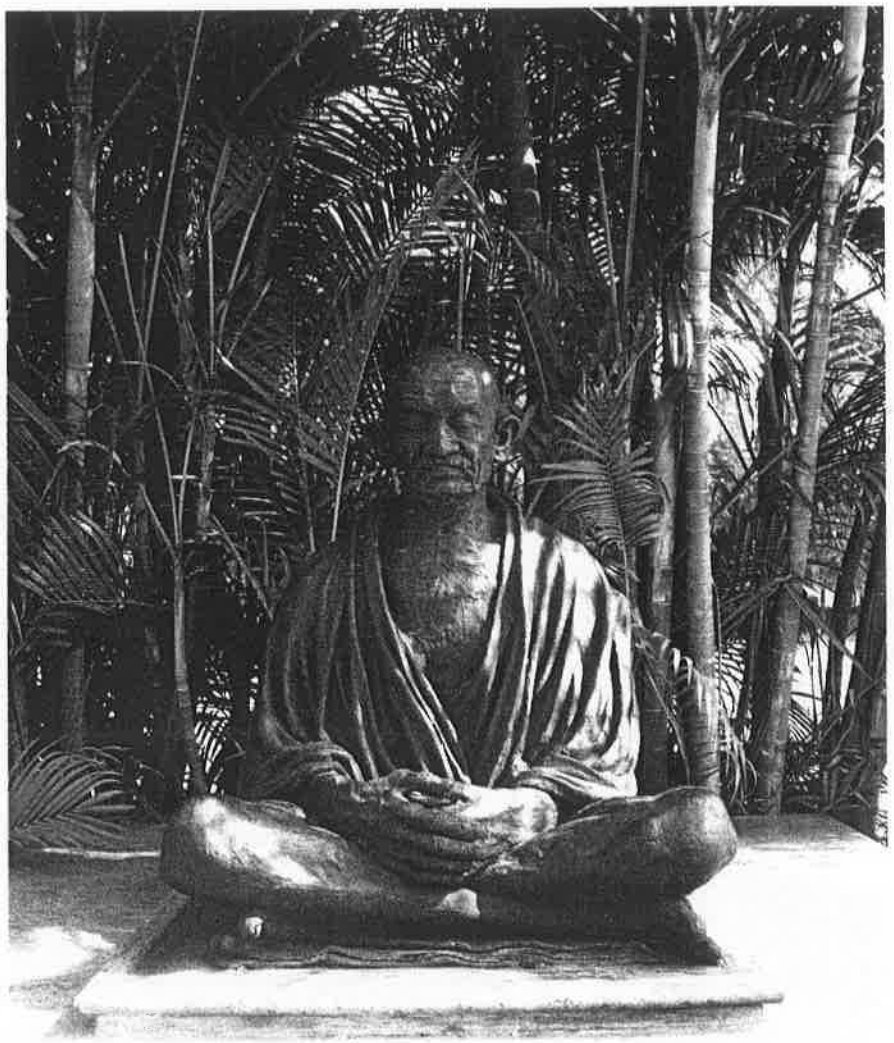
MD Degree in Anatomy



IN PURSUIT OF EXCELLENCE

MGM INSTITUTE OF HEALTH SCIENCES
(Deemed University Established u/s 3 of UGC Act, 1956)
Navi Mumbai - 410 209
www. mgmuhs.com

INSPIRING MINDS



Mission

To improve quality of the life for individuals and community by promoting health, preventing and curing disease, advancing biomedical and clinical research and educating tomorrow's Physicians and Scientists.

Vision

By 2020 the MGM University of Health Sciences will rank one of the top private Medical Institution. This will be achieved through ground breaking **discoveries in basic sciences and clinical research** targeted to prevent and relieve human suffering, **excellence in Medical Education** of the next generation of academic clinicians and intrinsic scientists.

MGM University of Health Sciences will transform the **Education of** tomorrow's Physicians and Scientists conducting Medical **Research** to advance health and improving lives by providing world-class patient care.

Many see the 21st Century as the golden age of biomedical research. The MGM University of Health Sciences will position for leadership at the horizon of this new era to promote and stabilise stand human health with a standard of excellence.

Chancellor's Message

It is my pleasure to welcome you to join constituent colleges of Mahatma Gandhi Misson's (MGM) University of Health Sciences, Navi Mumbai. I wish to avail this opportunity to apprise you and your parents about the academic excellence of the deemed university.

The MGM University of Health Sciences was established u/s 3 of UGC Act, 1956 vide HRD Notification No.F.9-21/2005-U.3(A) dated 30-8-2006. The MGM University is an outcome of untiring efforts of our educationists, professionals, social activists, technocrat, students and parents. The Mahatma Gandhi Mission Trust that manages the University of Health Sciences and over 40 institutions in Navi Mumbai, Aurangabad, Nanded, and Noida has the vision to empower the masses with the availability of state-of-the-art education. Most of our institutions have ISO certifications that further endorse our commitment to stringent quality standards. I am proud to state that we have succeeded in these accomplishments during our journey of the past 25 years.

I recollect the memories of struggle and determination when the MGM Trust established its two medical colleges, one each at Navi Mumbai and Aurangabad some twenty years ago. Both the medical colleges have grown into institutions imparting both undergraduate and postgraduate courses, and delivering quality health care to communities in their respective areas. While both colleges are engaged in their primary functions of teaching, patient care and research, they have also excelled in their pursuit for advancement of science and in taking health services to communities through extension programmes. A shining example is the establishment of the Department of Infectious Diseases in 1993 in collaboration with the University of Texas-Houston, USA. This department has established the state-of-the-art clinical services and laboratories for research and care of infectious diseases and received the acclaim of Director General of ICMR when he stated "MGM is the first medical college in India to establish a separate department of infectious diseases. This is the need of the hour." The department has undertaken path-breaking research and shaped the course of our national control programmes on HIV/AIDS and tuberculosis. The original research of the constituent colleges has been acclaimed among the scientific world globally.

In an era of economic liberalization and the competition among varsities, both in and out of India, the task of grooming professionals who will compete with the best in the world , is tough. To aid our efforts to excel, MGM University of Health Sciences has the latest research facilities, a dedicated research faculty, as well as an array of distinguished visiting faculty members. The quiet ambience of our campuses, the well filled library with subscriptions to international and national journals, and the lush-green gardens add to our accomplishments.

Considering the manpower needs of educational, industrial agricultural, and health sector to maintain their steady growth, several fresh M.Sc. courses have courses have been launched. M.Sc. courses introduced at the
University from the current academic year shall provide knowledge, skills and subsequent employability that are at par with the counterparts in India and abroad. The curricula of the courses have been designed by experts and peer-reviewed with an emphasis on the job requirements of educational institutions, industries, health care, and research institutions. These courses will empower the students to choose a career in a classroom, a research laboratory or an industry. I am happy that the university is ticking towards the pinnacle with the introduction of these value-added postgraduate courses in medical biotechnology, medical genetics and other basic sciences.

Finally, I wish to place on record my gratitude to the founder members, stake-holders, faculty, staff, students and their parents for providing the MGM Trust with your advice and support.

Once again, it is my pleasure to welcome you to join constituent colleges of MGM University of Health Sciences' at Navi Mumbai and Aurangabad.

Kamal Kishore Kadam
Chancellor

Dr R.D.Bapat
Vice Chancellor

Dr S.N.Kadam
Pro Vice Chancellor

Dr N.N.Kadam
Director (Examination)

Dr Ajit shroff
Dean (Aurangabad Campus)

Dr Z.G. Badade
Registrar

Dr G.S.Narshetty
Dean (Navi Mumbai Campus)

P.G. CURRICULUM IN THE SUBJECT OF ANATOMY

A. Goal: To prepare the postgraduate student to become an exemplary teacher and a research scientist par excellence. To achieve this goal, the postgraduate student in Anatomy should be given an overall exposure to the subject, teaching methodologies and a sound grounding in research technologies.

B. Learning objectives: To achieve this goal, the following objectives must be fulfilled.

I. Cognitive domain: At the end of three years of postgraduate training the student should be able to

1. Describe the gross anatomy of the human body and correlate the knowledge of structure and function.
2. Describe the microanatomy including cytology of various structures of the human body and compare the knowledge of microstructure with function and interpret it accordingly.
3. Interpret the anatomical basis of symptoms and signs of clinical conditions, diagnostic procedures and treatment modalities.
4. Describe the developmental aspects of human body and interpret the developmental basis of various congenital anomalies.
5. Describe the neuroanatomy in its entirety and interpret the neuroanatomical basis of various clinical conditions.
6. Explain various aspects of genetics and describe genetic basis of disorders and principles of genetics counseling.
7. Explain and interpret radiological anatomy and sectional anatomy of the human body as studied by various imaging techniques.
8. Comprehend surface and living anatomy of the human body.
9. Relate forensic anatomy to the study with medicolegal aspects of bone in particular.
10. Explain the general principles of Anatomy Act and Transplant of Human Organ Act.
11. Explain the process of embalming.
12. Comprehend ethical aspects of biomedical research.
13. Comprehend the basis of disposal of biomedical waste.
14. Comprehend horizontal integration of various subdivisions of anatomy with relevant physiology and biochemistry.

II. Psychomotor domain: At the end of the training, the student should be able to

1. Dissect and demonstrate various parts of adult human body
2. Demonstrate surface landmarks and living anatomy pertaining to mucle power, testing of nerves and palpating vessels.
3. Dissect and demonstrate various parts of a fetus .
4. Prepare tissue blocks ,perform H&E staining and is able to explain the principles of the following special stains -silver nitrate, periodic acid Schiff, osmic acid, Masson trichome, Verhoeff and Orcein stains .
5. Prepare and deliver lectures on various topics of human anatomy using audio-visual aids.
6. Operate computers so as to prepare documents, tables, charts and projection slides.

7. Identify research topics; carry out research and prepare a dissertation on a topic.
8. Present paper / poster in conferences.
9. Set undergraduate theory question paper, evaluate students and able to compute results including internal assessment marks.

III. Affective domain: At the end training the students should be able to

1. Co-operate with and react and respond in a cordial manner in his /her interaction with peers, superiors and subordinates.
2. Project a cheerful persona to the students.
3. Inspire the students to reach greater heights.
4. Arouse an element of curiosity and wonder in the minds of students.
5. Maintain a log book (Appendix - I).
6. Develop a healthy personality and a liking and respect for the subject.

C. COURSE DESCRIPTION

I. Eligibility: As per the guidelines of Medical Council of India and affiliated university.

II. Duration: 3 years

III. Desirable qualities: The student should have an aptitude for teaching and reasonable command over spoken and written English language.

IV. Details of Training: The P.G. student would be a resident in the department for 3 years. The time-plan and the proposed division of curriculum will be on the following lines.

1. FIRST YEAR OF RESIDENCY

a. ***Orientation programme***- Institutional and departmental orientation including duties and responsibilities of a postgraduate student.

b. ***Time Management*** - should be conducted within 3-6 month.

c. ***Stress Management***- should be conducted within 3-6 months.

d. **Gross anatomy**: Dissection of one whole human body and study of gross anatomy and acquisition of embalming skills.

e. **Microanatomy**: Basic techniques in tissue processing, preparation of blocks, microtome sections and H & E and principles of the following special stains -silver nitrate, periodic acid Schiff, osmic acid, Masson's trichome, Verhoeff and Orcein stains.

f. To attend all undergraduate lectures held in the department of Anatomy and all the lectures organized by the university by various PG teachers at different colleges.

g. To present the topic for dissertation and the research design in front of a dissertation committee comprising of all senior and PG teachers in the department within first six months of registration. Thereafter periodic assessment of the progress of the dissertation (every 6 monthly) will be done by the concerned PG teacher and if required, by the dissertation committee.

h. Get trained to use computer for teaching and use the internet

i. Scan Anatomy journals and periodicals.

j. **OPTIONAL yet DESIRABLE**: To attend all the orations/ seminars/ workshops held for the subject in the city colleges, attend general orations held in the institution and attend regional /national conferences.

k. TEACHING

i. 70 hours of small group teaching with at least 1/3 of these under supervision by a senior teacher.
ii. **Microteaching sessions** are mandatory before small group teaching for each and every session.
iii. Should be exposed to evaluation techniques.
iv. Exposure to Medical Education Technology Workshops
v. Presentation in Journal club.
vi. Presentation in Seminars and symposia.
vii. Should complete gross and microanatomy journals.

l. RESEARCH

i. Basic techniques like review of literature for a given topic and collection of data.
ii. Exposure to computer for various applications.

2. II YEAR OF RESIDENCY

a. SPECIAL POSTING

Interaction with other pre, para and clinical specialties so as to prime the mind of the P.G. students in Anatomy to the growing needs of application of anatomical knowledge to other branches of medicine .This will be achieved through **horizontal and vertical integration.**

Posting

i. Horizontal Integration

(Selected topics should be taken as PG lectures by the concerned departments.)

Physiology and Biochemistry

ii. Vertical integration (Lectures to be arranged by the various departments for PG students)

Radiology, Surgery, Orthopaedics, Medicine, Obs &Gynac, Genetic Laboratory Pathology, Microbiology& Forensic.

(Posting in pathology - to gain knowledge about Frozen-sections, use of cryostat, special immunohistochemical techniques and immunological techniques and morbid and medicolegal anatomy from postmortem.)

During vacation.

b. RESEARCH

Starting the work on thesis by the beginning of second year of residency with the aim to complete the data collection & analysis by the end of second year.

c. TEACHING

i. From middle of IInd year, the P.G. students in Anatomy should be capable of giving lectures for the entire batch of students.
ii. Start teaching Embryology and Genetics in small groups after microteaching Sessions.
iii. Should be conversant with the use of various audiovisual aids

d. Presentation in Journal Club
e. Presentation in Seminars / Symposia at the departmental and institutional level

f. FETAL DISSECTION: Should have dissected at least one fetus

3. III YEAR OF RESIDENCY

a. RESEARCH

i. Completion of Dissertation
ii. Presentation of paper in conference (optional but desirable)
iii. Writing articles for publication

b. TEACHING

i. Full fledged lectures, lecture-demonstration, small group teaching
ii. Seminars / Symposia
iii. Journal Club

c. DISSECTION - Exercise in window-dissection of various regions.

V. SYLLABUS

1. Postgraduate curriculum shall include the entire undergraduate curriculum as spelt out below (Appendix III) with modifications as under:
Levels 1 & 2 of U.G. curriculum will become Level 1 of P.G curriculum.
Levels 3 of U.G curriculum will become Level 2 of P.G. Curriculum
Levels.3 of P.G. Curriculum will include current trend and recent advances in the Concerned topic and historical aspects.

2. Additional topics to be covered

a. History of anatomy
b. Embalming techniques
c. Microanatomy
   i. Principles and types of Electron microscopy: TEM, SEM
   ii. Identification of various cell organelles and their EM appearance

a. Embryology: Stem Cell.
b. Genetics : a)Exposure to various DNA technologies, including cell culture, Karyotyping, Polymerase Chain Reaction (PCR) and Fluorescent-in-Situ-Hybridization (FISH)
c. Neuroanatomy: Limbic system and Reticular Systems - Details
d. Clinical Anatomy: Application of anatomical knowledge to explain the anatomical basis of various clinical symptoms and signs, diagnostic procedures and treatment modalities
e. imaging Modalities
   i. Radiology
   ii. Ultrasonography (USG): - Principles of USG, Orientation of anatomical organs, in various USG plates. Structures as seen in 2-D echocardiography axes used and orientation of heart in various axes in 2-D echocardiography.
   iii. PET scan: Principles.

f. Forensic Anatomy: Estimation of age and sex
   i. With reference to bones including ossification
   ii. With reference to radiology pictures
g. Cross-sectional Anatomy and its correlation to C.T. scan images and MRI images
h. Comparative Vertebrate Anatomy: Basic outline
I. Anthropology: Basic principles and anthropometry

D. EVALUATION

I. FORMATIVE: Internal assessment based on

1. Teaching: to be evaluated based on a given proforma (Appendix II)
2. Dissection
3. Log Book
4. Journals-Microanatomy and Gross anatomy
5. Examinations

a. Theory:

i. At the end of first year, two papers on general anatomy, gross anatomy, and microanatomy of the

* Upper half of the body: Head (without neuroanatomy), neck, upper limb, thorax and general anatomy.

** Lower half of the body: Diaphragm (Thoracoabdominal), abodomen, lower limb and general microantomy.

ii. At the end of second year, two papers on

* Embryology and Genetics (Including a. i. **).

** Neuroanatomy and applied anatomy (Including a. i. *)

30% of the paper will be constituted by multiple choice questions of the following types: Single best response, multiple true false, multiple completion and assertion reason.

iii. At the end of third year, preliminary examination as per the university examination

b. Practicals and viva

i. At the end of first year,

* Prepare a tissue block, stain and discuss. 10 microanatomy spots.

** Window dissection and viva on Osteology and soft parts.

ii. At the end of second year

* Viva on embryology models (Including b. i. *)

** Viva on brain (Including a. i. **)

iii. At the end of third year, preliminary examination as per the university examination.

II. SUMMATIVE

1. By points system – The following point scale should be strictly adhered to Points in fractions should not be assigned.

Point System	Remarks
0(Zero)	Very poor
1(one)	Poor
2(Two)	Below Average
3(Three)	Average
4(Four)	Good
5(Five)	Very Good
6(Six)	Outstanding

a. **Theory:** 4 papers (*As per Direction No. 01/2008 dtd 26/05/2008 & practical scheme is as per revised practical marksheet.)*

E. LIST OF RECOMMENDED BOOKS

I. Textbooks:

1. Cunningham's Manual of Practical Anatomy - Latest editions of volumes I, II, III
2. Regional & Applied Anatomy - R. J. Last
3. Clinical Anatomy for Medical Students - Richard Snell
4. Synopsis of Surgical Anatomy - McGregor
5. Functional Histology - Wheater, Burkit,
6. Langman's Medical Embryology
7. Embryology by Keith Moore
8. Clinical Neuroanatomy – Snell
9. The Human Nervous System - Murray Barr, John Kieman
10. Genetics by Emery
11. Human Genetics - S.D. Gangane
12. Essential of Human Genetics by Bhatnagar, Kothari and Mehta
13. Cross-sectional anatomy by Bo, Meehan and Kruger
14. Principles of General anatomy by A. K. Dutta
15. Comparative anatomy A.S. Romer.

II. Reference Books:

1. Gray's Anatomy
2. Clinical Anatomy _ NMS Series
3. Anatomy for Surgeons - Henry Hollinshead
4. Surgical Anatomy - Harold Ellis
5. Bailey's Textbook of Microscopic Anatomy
6. Embryology - Boyd & Mossman
7. Clinically oriented anatomy _ Keith Moore
8. Atlas of Human Histology – Di fiore
9. Tissues of the Human Body by Le Gros Clerk
10. Genetics by Thompson and Thompson
11. History of Anatomy - Charles Singer
12. History of Anatomy Indian Medicine - Kutumbiah
13. Dorlands Medical Dictionary

III. Journals:

1. Journal of Clinical Anatomy
2. Surgical & Radiological Anatomy
3. Journal of Anatomy
4. Development Dynamics
5. Anatomical Record
6. Journal of Anatomical Society of India

Appendix I (LOG BOOK)- Not yet FINALIZED

Log book details

Sr.No.	Date	Time	Topic /Activity	Teacher	Remarks and sign of PG teacher

*Topic -- Topic of lecture/Demonstration attended
Topic of Lecture/Demonstration taught

*Activity- Dissection – Part

- Microanatomy- Practical
- Special posting- Department

** Fortnightly submission of the logbook to the concerned PG teacher and signature obtained

BOM - 28/2013, dated 26-03-2013

Annexure -I

MGMIHS
MS (Anatomy – Syllabus of Practical)

Sr. No.	Topic	Particulars
	Terminology	Planes
		Common terminology
	Preservation Technique	
		Embalming
		Plastination
	Anatomy Act	
	Imaging techniques	
	X- Ray	Chest X ray Shoulder joint Elbow joint Wrist joint Hip joint Knee joint Ankle joint KUB Skull Water's view PNS Neck Spine
	Traditional	Principle
	Special technique	Barium
		IVP
		HSG
	Cross sectional anatomy	
	CT	
	MRI	
	Ultrasonography	
	Color Doppler	
	PET	

Sr. No.	Region	Particulars
	Embalming technique	
	Museum maintenance	
	Embryology description	
	Anthropometry	
	Medico legal cases	
	Superior Extremity	
1	Breast (Mammary Gland)	Extent of breast, Arterial supply, Lymphatic drainage
2	Axilla	Anterior wall, Clavi-pectoral fascia, Boundaries & contents' Show axillary vein also
3	Axillary artery and Brachial Plexus	Axillary ,artery and its branches Brachial Plexus
4	Scapular Region	Axillarynerve, Anastomosis around scapula
5	Typical spinal Nerve Dermatomes	
6	Cubital fossa, Elbow joint	Lateral view, Front view
7	Nerves of Superior Extremity	Nerves : Radial, Median, Ulnar, Musculocutaneous
8	Hand	Superficial palmar arch, Palmar spaces
9	Joint of Upper Limb	Shoulder joint, Radio-ulnar joints.
	Inferior Extremity	
10	Fermoral Triangle	Boundaries & floor, Contents, Roof, Femoral sheath & canal, Femoral artery, Femoral nerve
11	Adductor canal and obtrator nerve	
12	Gluteal region	Structers under gluteus maximus
13	Popliteal fossa	Roof, boundaries and contents, Popliteal artey
14	Hip Joint	
15	Great Saphenous vein	
16	Knee Joint	Ligaments & interior of joint
17	Arches of foot	
	Abdomen & Pelvis	

18	Rectus sheath & inguinal canal	
19	Male genital system	Testis, Male urethra, T. S. of Spermatic cord
20	Peirtoneum	Lasser sac, Mesentery, Epiploic foraman
21.	Stomach	Relations, Blood supply, Lymphatic drainage
22	Caecum & Appendix	Relations, Blood supply, types of caecum, Position of appendix
23	Duodenenum & Spleen	Visceral surface of spleen, Relations, Blood supply Interior of II part of duodenum
24	Liver	Extra-Hepatic, Biliary apparatus, Relations of inferior surface of liver
25	Portal ven	Portal vien and tributaries, sites of porto-caval 16Anastomosis
26	Pancreas	Relations, Blood supply, Duct pattern, Lymphatic Drainage Relations, Blood supply
27	Supra-renal	Relations, Blood supply
28	Kidney	Relation TS of Kidney, Vascular segements
29	Diaphragm	
30	Ovary & Uterine tube	Relations, Blood Supply
31	Urinary Bladder	Relations, Supports interior
32	Prostate	Relatios, Lodes, Capsules
33	Uterus & Cervix	Position, Relation, Interior, Supports
34	Rectum & Anal canal	Position, Relation, Interior
35	Perineum	Perineal membrance, Ischiorectal fossa, Superficial perineal pouch
	Head, Neck & Brain	
36	Scalp	Layers of scalp, Nerve & blood supply
37	Side of the neck	Antern Tringle, Postrior Tringle of neck
38	Dural sinuses	Cavernous sinus, Superior sagittal sinus
39	Orbits	Extrinsic muscles if eye ball Ophthalmic artery and its branches.
40	Parotid gland	
41	Submandibular region	Submandibular gland, structers over hypglossus, Relations
42	Thyriod gland	Blood supply
43	Cervical sympathetic system	
44	Cervical lympus nodes	

062

45	Pharynx	Exterior, Interior of pharynx
46	Tonsil, Auditory tube	
47	Nasal cavity	Lateral wall of nose, Septum of nose
48	Larynx	Cartilages, Interior Muscles and Igaments
49	Tonge	Muscles, Blood supply, Lymphane drainage
50	Cranial nerves	Oculomotor nerve
51		Mandibular nerve, Accessory spinal nerve, Hypoglossal nerve.
	Thorax	
52	Contents of typical intercostal Space and typical spinal nerve.	
53	Bronchopulmonary segments	
54	Interior of heart	Right atrium, Right ventricle
55	Blood supply of heart	Coronary arteries, veins
56	Arch of aorta	Branches, Relations
57	Azygos venous system	
58	58T. S. of spinal card	General plan Grey mater, White mater, Central canal
59	T. S. of mediulla oblongata	Pyranmidal decussation, sensory decussation
60	Floor of fourth Ventricle	
61	Pons	T. S. at- Lower pons, Upner pons
62	Mid-Brain	T. S. at Superior collicluc, T. T. at- Interior colliculus
63	Cerebrum	Superolateral surface, (Showing cerebral sulci and Gyri, functional areas and blood supply)
64	Ascending tract	Tract of Gall and Burdach
65	Descending tract	Cortispinal tacts
66	Visual pathway	
67	Auditory pathway	
68	Cerebrum	LS showing internal capsule and corpus striatum
	General Embryology	
69	Human Karyotype	
70	Ogenesis, spermatogenesis	
71	Blastocyst, yolk sac, Notochord, chorionic cillus	
	Systemic	

72	Pharyngeal arches, Tongue development Development of a plate and anomalies, development if thyriod
73	Development of stomach, caecum appendix, rectum and anal canal
74	Development of liver, gall bladder pancreas and spleen
75	Male genital tract development
76	Female genital tract development
77	Urinary system
78	Development of heart
79	Neural tube derivatives, neural crest derivaties
80	Development of suprarenal and pituitary glands
81	Development of eye ball

TOPICS	SUBTOPICS
1. The Microscope	
TYPES OF MICROSCOPES	
LIGHT MICROSCOPE: COMPOUND MICROSCOPE	PRINCIPLE
	PARTS AND PRINCIPLES
	USES RESOLUTION ADVANTAGES/ DISADVANTAGES
DIGITAL MICROSCOPY (NEW EDGE ADDED TO MICROSCOPY)	
PHASE CONTRAST MICROSCOPY	PRINCIPLES USES ADVANTAGE AND DISADVANTAGES
FLOROSANCE MICROSCOPE	PRINCIPLES USES ADVANTAGE AND DISADVANTAGES
ELECTRONE MICROSCOPE	
SCANNING ELECTRONE MICROSCOPE	PRINCIPLES USES ADVANTAGE AND DISADVANTAGES
TRANSMISSION ELECTRON MICROSCOPE	PRINCIPLES USES ADVANTAGE AND DISADVANTAG
ATOMIC FORCE MICROSCOPY	
MICROMETRY	

The Cell	CELL PLASMA MEMBRANE:
	Cell organelles : a. Membrane bound : i) Mitochondria ii) Golgi apparatus iii) Smooth endoplasmic reticulum iv) Rough endoplasmic reticulum v) Lysosomes b. Nonmembrane bound : i) Microtubules ii) Free Ribosomes / Polysomes iii) Microfilaments iv) Centriole v) Inclusions/ Pigment / Granules
	Nucleus
	Junctional Complexes
HISTOLOGY TECHNIQUE	
SELECTION OF TISSUE	
TISSUE PRESERVATION	IDEAL TYPES PRINCIPLES USES ADVANTAGES/ DISADVANTAGES
Common fixing agents	Formaldehyde (HCHO) Potassium dichromate Picric acid Acetic acid Ethyl alcohol (Ethnol) 10% frormal saline (Buffered soluntion) Murcuric chloride – formalin (formal sublimate) Zenker's Fluid: Bouin's Fluid
Tissue processing:	Dehydration Clearing Wax impregnation Other type of imprenation: Storage of paraffin blocks
Automatic tissue processing Other embedding methods	
Microtome	Rocking microtome

	Rotary microtomes Freezing microtomes Knives: ~~Knife~~ sharpening Section cutting
Manipulation and mounting of sections	
Preparation of frozen section:	
Standard staining methods	
Special stain:-	PAS Masson's trichrome stain
Epithelium	General features Simple Stratified Transitional Pseudostratified
	Ultrastructure Cilia Microvilli Stereocilia Kinocilia
Connective Tissue	General consideration
	Cell Fibers Ground substance
	Loose areolar tissue Adipose tissue Tendon
Cartilage	General consideration
	Hyaline cartilage Articular cartilage. Costal cartilage
	Elastic Cartilage
	Fibrocartilage
Bone	Ground bone (Dried compact bone) T. S.
	Developing bone L. S.
Muscle Tissue	Striated muscle Cardiac muscle Smooth muscle
	Ultrastructure of muscle
Nervous Tissue	Structure of neuron Types of neurons
	Neuroglial cells
	Nerve
Blood vessels	Ultrastrucute Cellular components

Lymphoid Tissue	Types vessels Basic immunology
	Lymphoid tissue: Lymph node Thymus Spleen Tonsil
Gland - General Consideration	Exocrine (Acinous and duct Endocrine (Cell and capillary) Paracrine
According to mode of secretion	Apocrine Holocrine Merocrine
According to the shape of secretory unit	Tubular : Tubular coiled Alveolar Tubuloalveolar According to the duct Simple unbranched Compound branched :
Integumentary System	
Gastrointestinal Tract	Lip, Tongue, Teeth
	Salivary glands (Exocrine)
	Oesophagus and Stomach
	Intestine (Duodenum, Small intestine, Large intestine and Appendix)
	Liver, Gall bladder and Pancreas
Respiratory System	Epiglottis
	Trachea T. S.
	Bronchus T. S
	Lung
Urinary System	Kidney
	Ureter T. S
	Urinary bladder
Male Reproductive system	Testies
	Epedidemis

	Vas difference
	Prostate
Female Reproductive system	Ovaries
	Fallopiean tube
	Uterus
Endocrine	Pitutary
	Thyroid
	Suprarenal
Nervous System	Spinal cord
	Cerebellum
	Cerebrum
Organs of Special senses	
Eye	Cornea
	Retina
	Sclerocorneal junction
Ear	Organ corti
Genetics	
	Introduction
	Branches of Genetics
	Mendel's Laws of Inheritance
	Chromosomes and Sex chromatin Human chromosome Classification
Molecular Genetics:	DNA structure, Codon and Gene Structure of RNA and Protein synthesis steps
	Cell Cycle Cytogenetics
	Mitosis and Meosis
	Chromosomal Disorders
	Common chromosomal number disorders
	Modes of inheritance and Gene disorders
	Haemoglobin disorders
	Immunogenetics
	Genetics and Cancer
	Developmental Genetics
	Genetic counseling
	Human Genome Project
	Stem Cell

	Cell culture/ Tissue culture

MGM INSTITUTE OF HEALTH SCIENCES, NAVI MUMBAI

MARKLIST FOR PRACTICAL AND VIVA-VOCE EXAMINATION

EXAM CENTRE:_____ **COURSE / EXAM : PG –**

DATE OF EXAMINATION:_____ **EXAMINATION FOR: M.D. (ANATOMY)**

Seat No.	1	2					3									Grand Total Practical Total =400 Marks (1+2+3)
	Long Case	Short Case					Viva/Orals									
	1	Microanatomy	Neuroanatomy slides	Genetics Chart –1	Histology Techniques	Total	A	B	C	D	E	F	G	Dissertation	Total	
	100 marks	(5x8) 40	10	10	50	110 marks	40	30	20	40	20	20	20		190	

NAME OF EXAMINER	COLLEGE	SIGNATURE WITH DATE
1.		
2.		
3.		
4.		

Paper Wise Distribution of Topics

viii)	M.D.	ANATOMY	I.	General and gross anatomy including corresponding microanatomy and embryology and clinical anatomy of Head, Face, Neck and Thorax.
			II.	Gross anatomy including corresponding microanatomy and Embryology and clinical anatomy of Abdomen, Pelvis and Perineum and superior and inferior extremity.
			III.	Neuroanatomy including corresponding microanatomy, embryology and clinical anatomy.
			IV.	Genetics, Radiological Anatomy, Sectional Anatomy, Clinical Anatomy and Recent Advances.
	MD	Psychiatry	I	Basic Sciences – Neuroanatomy, Neurophysiology, Psychology and their applications
			II	Neuropsychiatry, Liaison Psychiatry
			III	Clinical Psychiatry Part - 1
			IV	Clinical Psychiatry Part -2 with Recent Advances
	MD	Biochemistry	I	General Biochemistry and Instrumentation
			II	Metabolism and Nutrition
			III	Clinical Biochemistry
			IV	Molecular Biology, Biotechnology and Recent Advaces in Clinical Biochemistry
	MD	Respiratory Medicine	I	Basic Sciences – Anatomy, Physiology, Pathology, Microbiology, Pulmonary and extra pulmonary T.B., Public Health, Surgical aspects
			II	Non-Tubercular Pulmonary Diseases
			III	Internal Medicine as applied to pulmonary Medicine
			IV	Recent advancement in pulmonary medicine

IN PURSUIT OF EXCELLENCE

MGM DEEMED UNIVERSITY OF HEALTH SCIENCES

Constituent Colleges

Navi Mumbai

M.G.M. Medical College
M.G.M School of Biomedical Science
M.G.M School of Physiotherapy
M.G.M New Bombay College of Nursing
M.G.M College of Nursing

Aurangabad

M.G.M. Medical College
M.G.M School of Biomedical Science
M.G.M School of Physiotherapy
M.G.M College of Nursing

MAHATMA GANDHI MISSION

AURANGABAD

- MGM's Jawaharlal Nehru Engineering College
- MGM's Institute of Management
- MGM's Mother Teresa College of Nursing
- MGM's Mother Teresa Institute of Nursing Education
- MGM's College of Journalism & Media Science
- MGM's Medical Center & Research Institute
- MGM's College of Fine Arts
- MGM's Dr. D. Y. Pathrikar College of Comp. Sc. & Tech.
- MGM's Hospital & Research Center
- MGM's College of Agricultural Bio-Technology
- MGM's Dept. of Bio-Technology & Bio-informaties.
- MGM's Inst. of Hotel Management & Catering Tech.
- MGM's Institute of Indian & foreign Languages & Comm.
- MGM's College of Physiotherapy
- MGM's Hospital, Ajabnagar
- MGM's Sangeet Academy (Mahagami)
- MGM's Institute Naturopathy & Yoga
- MGM's Sports Club & Stadium
- MGM's Institute of Vocational Courses
- MGM's Horticulture
- MGM's Health Care Management
- MGM's Junior College of Education (Eng. & Mar.)
- MGM's Sanskar Vidyalaya (Pri. & Sec. - Mar.)
- MGM's Clover Dale School (Pri. & Sec. - Eng.)
- MGM's First Steps School (Pre-Primary - English)
- MGM's Sanskar Vidyalaya (Pre-Priamary - Marathi)
- MGM's School of Biomedical Sciences

NAVI MUMBAI

- MGM's College of Engineering & Technology
- MGM's Institute of Management Studies & Research
- MGM's Dental College & Hospital
- MGM's College of Physiotherapy
- MGM's College of Media Science
- MGM's Institute of Research
- MGM's New Bombay Hospital, Vashi
- MGM's Hospital, CBD
- MGM's Hospital, Kamothe
- MGM's Hospital, Kalamboli
- MGM's Infotech & Research Centre
- MGM's Pre-Primary School (English & Marathi)
- MGM's Primary & Secondatry School (Eng. & Mar.)
- MGM's Junior College Science
- MGM's Junior College of Vocational Courses
- MGM's Florence Nightingale Inst. Nursing Edu.
- MGM's College of Nursing
- MGM's College of Law

NANDED

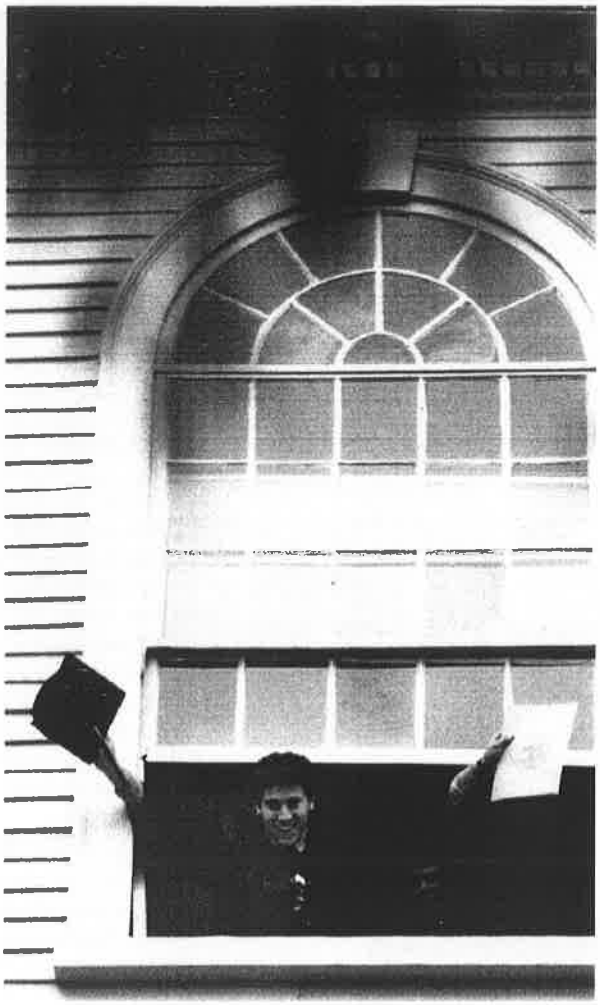
- MGM's College of Engineering
- MGM's College of Fine Arts
- MGM's College of Computer Science
- MGM's College of Journalism & Media Science
- MGM's Centre for Astronomy & Space Tech.
- MGM's College of Library & Information Science

PARBHANI

- MGM's College of Computer Science

NOIDA (U.P.)

- MGM's College of Engineering & Technology



MGM University of Health Sciences
(Education - Health Services - Research)
A Mission started, nurtured and Managed
by Professional Doctors, Scientists Engineers...

MGM INSTITUTE OF HEALTH SCIENCES
(Deemed University u/s 3 of UGC Act, 1956)

Post Box -6, MGM Educational Complex, Sector-18,
Kamothe, Navi Mumbai – 410209
Ph : - 022-27422471, 65168127, 65138121 Fax : 022-27420320
E-mail : mgmuniversity@mgmuhs.com
Website: www.mgmuhs.com

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

Resolution No. 5.25: Resolved to institute 6 monthly progress Report for PG Students of all Courses from the batches admitted in 2016-17. **[Annexure-XVII of BOM-48/2017]**

ANNEXURE - XVII

Mahatma Gandhi Mission's Medical College and Hospital
Navi Mumbai

Six monthly Progress Report for Postgraduate Students

PART A

Name of the PG student: .....

Department: .....

Admitted in (Month and Year): .....

Name of the PG guide: .....

Report for the period: ..... to .....

Attendance: _____days (_____%)

PART B

Grading as per performance

Grade	Percentage
A	80% and above
B	65% to 79%
C	50% to 64%
D	Below 50%

1. OPD work:
2. Ward work:
3. Lab work:
4. OT work:
5. ICU work:
6. Teaching assignments:

PART C

Progress of Thesis

PART D

Activities from serial No. 1 to 5 should be rated on a scale of 0 to 10.

1. Case Presentations

Sr. No.	Topic	Date	Guide	Marks

2. Microteaching

Sr. No.	Topic	Date	Guide	Marks

3. Recent Advances

Sr. No.	Topic	Date	Guide	Marks

PART E

1. Papers presented

Sr. No.	Title of Paper	Authors	Event	Date

2. Posters presented

Sr. No.	Title of Poster	Authors	Event	Date

3. Publications

(Note: Mention only those publications that are published or are accepted for publication during the said period only)

Sr. No.	Title of Paper	Authors	Journal	Year/Vol/ Issue	Page Nos	Indexed/ Non-Indexed	Status

4. Seminars

Sr. No.	Topic	Date	Guide	Marks

5. Journal Clubs

Sr. No.	Journal	Title of Paper	Date	Guide	Marks

6. Marks obtained in tests

Sr. No.	Date	Theory / Practical	Marks obtained

7. Any other academic activity conducted:

PART E

1. Papers presented

Sr. No.	Title of Paper	Authors	Event	Date

2. Posters presented

Sr. No.	Title of Poster	Authors	Event	Date

3. Publications

(Note: Mention only those publications that are published or are accepted for publication during the said period only)

Sr. No.	Title of Paper	Authors	Journal	Year/Vol/ Issue	Page Nos	Indexed/ Non-Indexed	Status

Certificate by the PG Guide

This is to certify that Dr _____ has an attendance of _____% , during the period _____ to _____
His /Her performance during the said period has been satisfactory/ average / unsatisfactory.

Overall Grading: _____

Date: _____

Name and Signature of PG guide:

Certificate by the Head of Department

This is to certify that the performance of Dr _____, during the period _____to_____ . has been satisfactory/ average / unsatisfactory.

Overall Grading: _____

Date: _____

Name and Signature of HOD:

Final Remarks

Satisfactory / Average / Unsatisfactory

Director (Academics) Dean

Date:

Resolution No. 1.3.7.13 of BOM-51/2017: Resolved to accept PG Topics (50 hrs)– Anatomy, Physiology, Biochemistry [Annexure-IV]

Annexure-VI

DEPARTMENT OF ANATOMY
POST GRADUATE LECTURES / FACILITATION

	FIRST YEAR –	NO of Lect
1	Introduction to department and Induction program.	1
2	Introduction to Anatomy & Objective of post graduation.	1
3	Anatomical terminologies & language of medicine.	1
4	Learning teaching skills.	1
5	Small group vs Large group teaching.	1
6	Microteaching – I	1
7	Microteaching – II	1
8	Student centric teaching.	1
	Research methodology.	
9	Selection of topic & sample size.	1
10	Teaching learning ethics.	1
11	Cadaver handling / Ethics.	1
	General Anatomy.	
12	An Overview of Tissue of body.	1
13	An Overview of Cartilage and bone	1
14	An Overview of Joints.	1
15	An Overview of Muscles.	1
16	An Overview of Lymphatic System.	1
17	An Overview of Nervous system.	1
18	An Overview of Cardio vascular system.	1
19	Imaging technique.	1
	Super Extremity	
20	Overview of extremity & organ of prehension.	1
21	Shoulder girdle.	1
22	Mammary gland.	1
23	Axillary artery & axillary lymph nodes brachial plexus.	1
24	Dermatomes of superior & venous drainage of superior extremity.	1
25	Cubital fossa & elbow joint.	1
26	Radioulnar joint and supination and pronation.	1
27	Medial and ulnar nerve.	1
28	Radial and axillary nerve.	1
29	Palmar spaces and 1st carpometacarpal joint.	1
30	Hand grips.	1
	Thorax	
31	Thoracic cage & mechanism of respiration.	1
32	Mediastinum.	1
33	Lung and bronchopulmonary segments.	1
34	Heart chambers and blood supply.	1
35	Conducting system of heart.	1
36	Azygous system of veins.	1

11/8/12

37	Vertebral column.	1
	Histology	
38	Microscope and Histology Techniques.	1
39	Collection of tissue and tissue processing.	1
40	Cell.	1
41	Epithelium-I	1
42	Epithelium- II	1
43	Glandular Epithelium	1
44	Cartilage & Bone I.	1
45	Cartilage & Bone II.	1
46	Muscles.	1
47	Nervous Tissue.	1
48	Artery, Aorta and vein.	1
49	Lymph node. Spleen and tonsil	1
50	Thymus and Immunity.	1
	General Embryology	
51	Embryology and developmental biology & its Historical overview.	1
52	Gametogenesis.	1
53	Fertilization & bloastocyst.	1
54	Implantation & germ layer formation with notched.	1
55	Folding of embryo & body axis plan.	1
56	Placenta.	1
57	Twinning & teratology.	1
	Total	57

DEPARTMENT OF ANATOMY

POST GRADUATE LECTURES/FACILITATION

	Second Year	NO of Lect
1	Communication skill.	1
2	Effective use of media.	1
3	Body donation.	1
4	Histology techniques.	2
5	Adult learning.	1
6	Review of literature	1
7	Design material method.	1
8	Observation	1
9	Statistics.	1
10	Privacy, confidentiality & PCPNDT.	1
11	Medical Ethics & Mentorship.	1
	Abdomen	
12	Inguinal canal.	1
13	Rectus sheath.	1
14	Testis.	1
15	Peritoneum.	2
16	Stomach.	1
17	Ceacum and appendix.	1
18	Pancreas.	1
19	Duodenum.	1
20	Extrahepatic billary apparatus and portal vein.	1
21	Kidney.	1
22	Autonomic nervous system of abdomen.	1
23	Ischiorectal fossa.	1
24	Urinary bladder.	1
25	Perineal pouches.	1
26	Prostate gland.	1
27	Male urethra.	1
28	Uterus.	1
29	Rectus and anal canal.	1
30	Sections of abdomen.	1
31	Other imaging techniques.	1
	Histology	
32	General plan of GIT – oesophagus & stomach.	1
33	Small intestine, large intestine & appendix	1
34	Liver	1
35	Pancreas and gall bladder.	1
36	Epiglottis, trachea.	1
37	Bronchus and Lungs	1
38	Kidney.	2
39	Ureter & Urinary bladder.	1

DEPARTMENT OF ANATOMY

POST GRADUATE LECTURES/FACILITATION

40	Testies.	1
41	Epidydemis, vas deferens & prostate.	1
42	Ovary.	1
43	Fallopian tube and umbilical cord.	1
44	Uterus.	1
45	Mammary gland and Placenta	1
46	Skin scalp.	1
	Embryology	
47	Oesophagus, 1st part of duodenum and stomach	1
48	Intestines, umbilical hernia and its reduction	1
49	Anomalies of rotation of gut and liver, gall bladder, pancreas and spleen	1
50	Rectum, anal canal and its anomalies	1
51	Pronephros, mesonephros and metanephors	1
52	Histogenesis of kidney and ureter	1
53	Ascent of kidney and anomalies	1
54	Urinary bladder, prostate and urethra and anomalies	1
55	Male genital organs and anomalies	1
56	Female genital organs and anomalies	1
57	Primitive blood vessels, heart tubes and formation of chamber and folding of heart tubes	1
58	Atrial and ventricular division, formation of chambers	1
59	Division of truncus arteriosus and chambers of heart	1
60	Development of skeletal system	2
	Inferior extremity	
61	Femoral triangle, femoral sheath and canal	1
62	Adductor canal and obturator nerve	1
63	Gluteal region	1
64	Popliteal fossa	1
65	Hip joint	1
66	Cutaneous nerves and venous and lymphatic drainage	1
67	Knee joint	1
68	Sole of the foot	1
69	Arches of foot and mechanism of walking	1
	Total	73

DEPARTMENT OF ANATOMY

POST GRADUATE LECTURES/FACILITATION

	Third Year	NO of Lect
1	Theory evaluation and paper setting	1
2	Methods of assesment	1
3	Early Clinical exposure	1
	Research methodolgy	
4	Discussion, summary and conculsion	1
5	Citation	1
6	Plagiarism	2
	Head, Neck and Face	
7	Scalp	1
8	Fascia of neck and cervical lymph nodes	1
9	Muscles of facial expression and lacrimal apparatus	1
10	Cavernous sinus	1
11	Thyroid gland	1
12	Subclavian artery	1
13	Tongue and hypoglossal nerve	1
14	Extraocular muscles and movements of eye ball	1
15	Muscles of mastication, Mandibular nerve and otic ganglion	1
16	Submandibular region	1
17	Parotid gland and facial nerve	1
18	Tempromandibular joint	1
19	Soft palate and tonsil	1
20	Muscles of pharynx and deglutition	1
21	Nasal cavity	1
22	Muscles of larynx and phonation	1
23	3^{rd}, 4^{th} and 6^{th} cranial nerves	1
24	9^{th}, 10^{th}, 11^{th} nerves	1
25	Middle ear	1
26	Imaging in HNF	1
	Central nervous system	
27	Spinal cord I	1
28	Spinal cord II	1
29	Spinal cord III	1
30	Medulla oblongata I	1
31	Medulla oblongata II	1
32	Pons	1
33	Cerebellum	1
34	Mid brain	1
35	Functional areas and blood supply of cerebrum	1
36	White matter of cerebrum (Internal capsule)	1
37	Hypothalamus	1

DEPARTMENT OF ANATOMY
POST GRADUATE LECTURES/FACILITATION

38	Thalamus	1
39	Limbic system	1
40	Reticular formation	1
41	Ventricular system of brain	1
42	Basal ganglion	1
43	Sections of brain	1
44	Imaging technique in CNS	1
	Histology	
45	PITUITARY GLAND, SUPRARENAL GLAND	1
46	THYROID AND PARATHYROID	1
47	SPINAL CORD, CEREBRUM	1
48	CEREBELLUM	1
49	CORNEA, RETINA AND LENS	1
50	INTERNAL EAR	1
51	Tissue processing and staining	1
52	Maintanance of instuments	1
53	Special staining	1
	Embryology	
54	Pharyngeal pouches and arches	1
55	Respiratory system and anomalies	1
56	Face and oral cavity and its anomalies	1
57	Gum, cheek and salivary glands and tooth	1
58	Development of skin	1
59	Nervous system formation of neural tube and plexus	1
60	Histogenesis of neural tube, ventricles, spinal cord, brain stem and cerebellum	1
61	Neural crest cells, adrenal gland and hypophysis cerebri	1
62	Eye ball and lacrimal apparatus	1
63	Ear	1
64	Developmental genetics	2
	Genetics	
65	Introduction to genetics and its branches	1
66	Human chromosome and sex determination	1
67	Genes, Genetic code and gene mutation	1
68	Chromosomal aberration and types	1
69	Mendelian laws and application in human genetics	2
70	Common chromosomal abnormalities	3
71	Hamatologic and immunological genetics	1
72	Cell cycle and cancer genetics	1
73	Prenatal testing and genetic counseling	2
74	Human genome project and Ethics	1
	Total	80

Resolution No. 1.3.7.11 (i) of BOM-51/2017: Resolved that the following Bioethics topics in PG Curriculum are to be included for PG students of all specialization and a sensitization of these topics can be done during PG Induction programme:

- Concept of Autonomy
- Informed Consent
- Confidentiality
- Communication Skills
- Patient rights
- Withholding / Withdrawing life-saving treatment
- Palliative Care
- Issues related to Organ Transplantation
- Surgical Research and Surgical Innovation
- Hospital Ethics Committee
- Doctor-Patient relationship

Resolution No. 1.3.23 of POM-51/2017: Resolved to implement a Structured Induction programme (07 days) for PG students. [Annexure-XLIV]

MGM INSTITUTE OF HEALTH SCIENCES
Navi Mumbai

Induction Program for newly admitted Postgraduate students

Day 1	• Address by Dean, Medical Suptd, Director (Academics) • Pre-test • Communication Skills • Universal Safety Precautions • Biomedical Waste Management • Infection Control Policy
Day 2	• Emergency services • Laboratory services • Blood Bank services • Medicolegal issues • Prescription writing • Adverse Drug Reaction • Handling surgical specimens
Day 3	• Principles of Ethics • Professionalism • Research Ethics • Informed Consent • Confidentiality • Doctor-Patient relationship
Day 4 Day 5 Day 6	• Research Methodology • Synopsis writing • Dissertation writing • Statistics
Day 7	• ATLS • Post-test

The Induction Program will be conducted in the first week of June.
Timing: 9.30 am to 3.30 pm

(Prof. Dr. Siddharth P. Dubhashi)
Director (Academics)

Resolution No. 3.5.6 of BOM-52/2018:

(i) Resolved to have allied postings for MD Anatomy, MD Physiology and MD Biochemistry as mentioned below, with effect from batch admitted in 2017-18 onwards:

1) **MD Anatomy –**
   a. Pathology – 2 weeks
   b. FMT – 2 weeks
   c. Radiology – 4 weeks
   d. Genetics – 2 weeks

NOTE : MD Student from Aurangabad campus can be deputed for genetics posting in Navi Mumbai campus.

Resolution No. 3.5.7 of BOM-52/2018: Resolved to include the below mentioned topics of Bioethics in PG Curriculum, with effect from batch admitted in 2016-17 onwards:

(i) MD Anatomy :

1. Biomedical waste disposal
2. Laboratory quality assurance
3. Genetic counseling

*PG student should attend cadaveric oath with UG students

(iv) Further it was also resolved to include the above Bioethiics topics in respective PG handbooks.

Resolution No. 4.5.4.2 of BOM-55/2018: Resolved to have 10 short notes out of 11 (10 marks each) in all the papers in university examination for PG courses including superspeciality. To be implemented from batch appearing in April/May 2019 examination onwards for MD/MS/Diploma and August/September 2019 examination onwards for superspeciality.