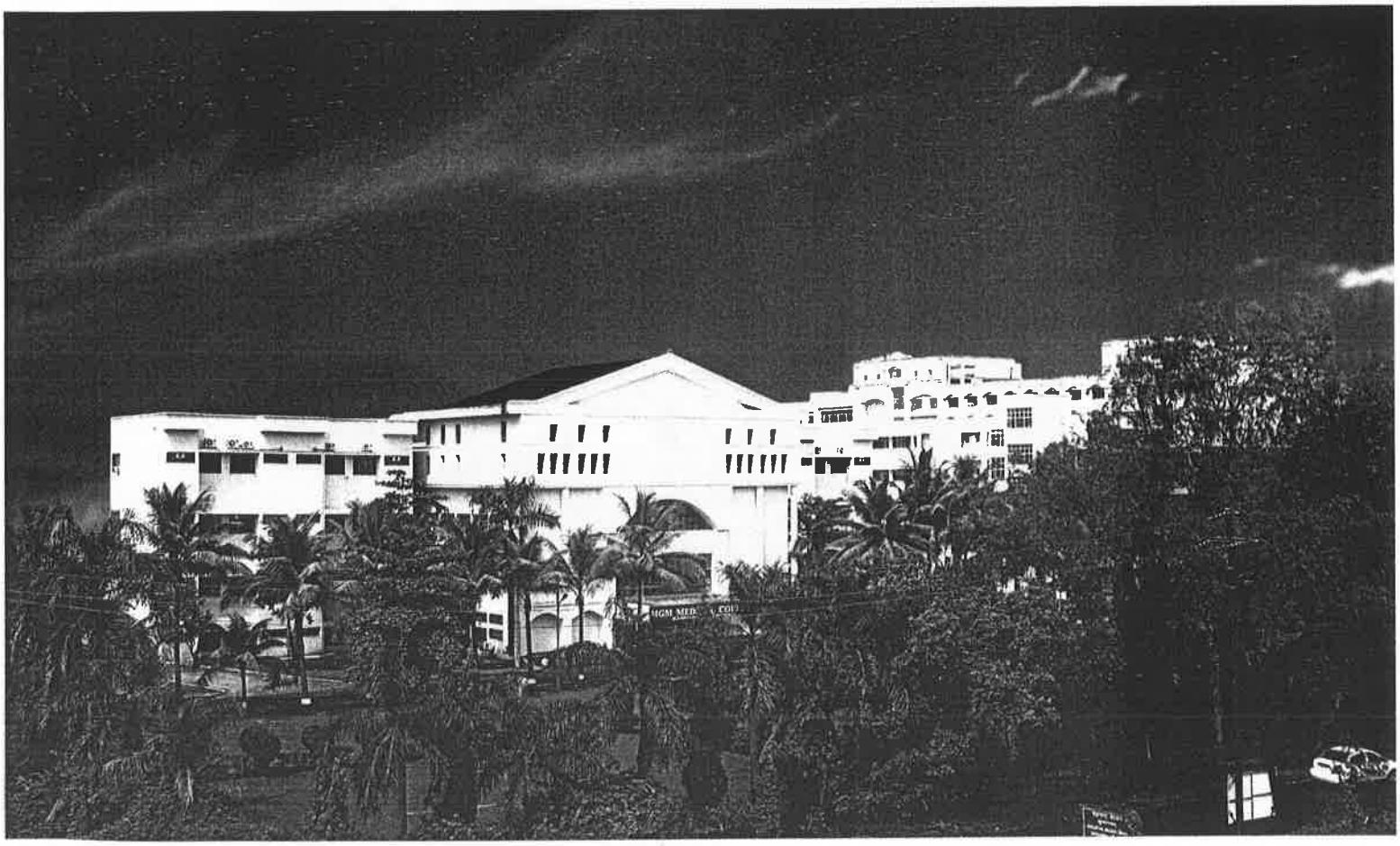
Curriculum for

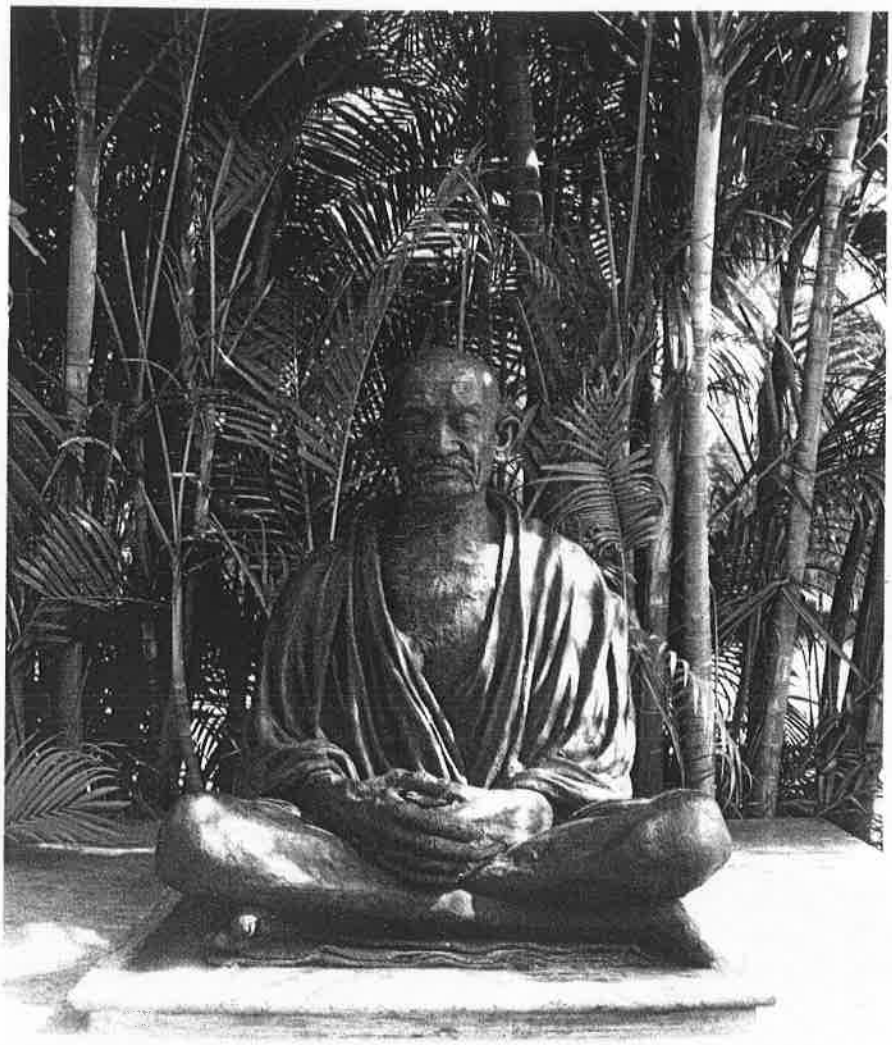
MD Degree in Physiology



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)

TO BE CIRCULATED TO COLLEGES CONDUCTING PG COURSE

CURRICULUM
SYLLABUS IN M.D. HUMAN PHYSIOLOGY

POST GRADUATE TEACHING / TRAINING COURSE FOR M.D. DEGREE

1) GOAL

To aim of the course is to prepare P.G. student in the subject of Human Physiology who shall

1) Teach and train future undergraduate and postgraduate medical students in Human Physiology in Medical College and Research Institutions.
2) Carry out and guide research and contribute to advancement of the subject.

LEARNING OBJECTIVES :

At the end of training course a P.G. student have thorough knowledge of the body with respect to

1) Cognitive domain
   All the systems of the body should be studied with respect to :
   a) Historical aspect
   b) Evolution and development
   c) Comparative physiology
   d) Structure-gross and electron microscopic and functions at cellular level
   e) Qualititative and quantitive aspects
   f) Regulating mechanisms
   g) Variations in physiclogical and pathological conditions
   h) Applied physiology
   i) Recent advances

2) Psychomotor domain :
   P. G. student should be able -
   a) to perform human and animal (mammalian and amphibian) experiments. Haematology experiments based on biophysical principles.
   b) to acquire history taking and clinical examination skills.

3) Affective domain :
   a) The P.G. students should develop communication skills to interact with students, colleagues, superiors and other staff members.
   b) They should be able to work as a member of a team to carry out teaching as well as research activities.
   c) They should have right attitude (medical ethics) toward teaching profession.

II. COURSE DISCRIPTION

[redacted]

COURSE CONTENT

Since the students would be working in the department for three years, the time plan and proposed division of course content will be on the following lines.

First Year :

1) Theory :
   - To attend the U.G. lectures and study in detail the following topics : Topics – General physiology, Environment physiology, Nerve, Muscles, Blood, Endocrines, Reproduction, Alimentary system. Also lectures on Metabolism in Biochemsitry.
   - To attend P.G. lectures at other P.G. Centre.

2) Practicals :
   - To attend the practical and demonstrations tought by senior teachers for U.G. students.

   First Term : Haematology, Nerve, Muscle, Heart.
   Second Term : Clinical examination.
   - To learn basic techniques and instruments used for U.G. practicals.
   - Micro teaching sessions for practicals.

3) To learn evaluation techniques.

4) Research :
   - To attend and present Journal Club / Seminars.
   - Visits to library and get acquainted with scientific journals.
   - Second half of First year – review of literature to choose the topic of the dissertation.

5) Exposure to Medical Education and Technology Workshops, held either by local faculty members or MUHS.

Second Year :

1) Theory :

- To attend the U.G. lectures and study in detail the following topics. Topics – Renal physiology, Cardio Vascular System, Respiratory system, Exercise physiology, Special senses, Central Nervous System.
- To attend demonstrations and lectures in Anatomy in CNS.
- To attend the P.G. lectures at other P.G. centres.

2) Prcticals :

- To perform amphibian and mammalian experiments, inclusive of basic techniques of handling of laboratory animals, anaesthesia, dissertation and instruments.

3) To learn in details the teaching learning methods and the methods of evaluation in practical and theory.

4) Teaching :

- Small group teaching in practicals and demonstrations.
- Should learn to use audiovisual aids.

5) Research :

- To carry out dissertation work and to learn basic topics in statistics.

6) To attend meeting organized by clinical departments

- Two months clinical posting (In Medicine – 1 month, elective – 1 month such as Family Planning, Radiodiagnosis, Chest, Blood Bank etc) Posting in Medicine to understand Pathophysiology of disease processes. Also learn the basic principles of diagnostic technique and management.

Third Year :

1) Research :

- Completion and submission of dissertation after completing 2 years (4 terms) of PG and 6 months, prior to commencement of examination. If not submitted in stipulated time a term may be extended.
- Writing articles for publication.

2) Teaching :

- To teach all practicals to U.G. students.
- To conduct microteaching sessions for 1st year P.G. students.
- To teach theory topics in small groups for U.G. students.

3) Practicals :

- To carry animal experiments independently
- Journal completion
  - UG as usual .
  - PG as practicals
  - Clinical posting record

THEORY TOPICS :

In addition to U.G. syllabus

1) General Physiology
   - Biological membranes with details of membrance receptors.
   - Physiology of growth and senescence.
   - Principles and applications – Genetics

2) Environmental Physiology :
   - Physiology of deep sea diving
   - Space physiology
   - High altitude physiology
   - Temperature regulation – Hypothermia, Hyperthermia
   - Pollution – air, noise

3) Nerve :
   - Experimental techniques to study bioelectrical phenomena (Voltage Clamp Technique, cathode ray sciloscope, S.D. curve, nerve conduction studies)

4). Muscle :
   - E.M.G. details.
   - Smooth muscle
   - Pathophysiology of muscle disorders.

5) Blood :
   - Immunity – details
   - Plasmin system
   - Tissue typing

6) Cardio Vascular System :
   - Echocardiography and vector cardiography, ECG.
   - Stress test, CT scan.
   - Cardiac Catheterisation and other invasive procedures.
   - Flowmeters / Ultrsongraphy

7) Respiratory System :

- Lung function tests – details
- Blood gas analysis
- Hyperberic oxygen
- Artificial respiration / Cardiopulmonary resuscitation

8) Endocrines :

- Radio immuno assay

9) Reproductive System :

- Invitro fertilization
- Contraceptives – details
- Neonatal and foetal physiology

10) Alimentary System

- Gastro intestinal hormones – details
- Gastro interstinal motility – details
- Absorption of nutrients

11) Renal Physiology :

- Artificial kidney
- Acid – base balance – details
- Cystrometry

12) Central Nervous System :

- Higher function
  (Speech, memory, learning, behavioural physiology, sleep and wakefulness)
- Voluntary movement
- Details of the following topics covering physiological anatomy, connection-intrinsic, Extrinsic, methods of study of functions with diagnostic techniques, functions.
- Physiological basis of manifestations of the diseases of the follwing
  - i) Cerebral cortex
  - ii) Basal ganglia
  - iii) Cerebellum
  - iv) Reticular formation
  - v) Thalamus
  - vi) Hypothalamus
  - vii) A.N.S.
  - viii) Limbic system
- Any recent techniques – principles and their applications
- CT scan, MRI

13) Special Senses :

- Audiometry
- Retinoscopy, fundoscopy, computerized perimetry
- Electrophysiology of retina, chochlea

14) Exercise Physiology :

- Concept of health fitness
- Physical fitness, its components and evaluation
- Adaptions due to prolonged conditioning

15) Nutrition :

- Relationship of diet anddiseases, starvation, obesity

16) Stress relaxation technique :

- Principles of various stages of yoga, breathing exercises, Mediatation and others.

PRACTICALS :

In addition to UG syllabus : To be able to perform hematology demonstrations – Reticulocyte count, platelet count. Interpretation of peripheral and bone marrow smear.

1) Recording of blood pressure and respiration in mammalian animal.
   - Effects of vagal stimulation and ablation
   - Effects of Asphyxia
   - Actions of Acetylcholine
   - Clamping of carotid arteries
   - Circulatory shock
2) Perfusion of mammalian hear
   - Effects of various factors
3) Recording of smooth muscle activities and effects of various factor
4) Clinical presentations – common cases
5) Human experiments – EMG, ECG, Spirometry, Ergography, Nerve conduction
6) Interpretation of biochemical reports

II TEACHING LEARNING METHODS :

The teaching learning activities would consists of

1) Attending U.G. lecture.
2) Attending P.G. lecture.
3) Microteaching sessions
4) Journal clubs moderated by teachers
5) Seminars, symposia, panel discussion of suitable topics moderated by teachers

6) Lectures and practicals prepared and presented by students under supervision
7) Attend and participate in conferences, workshops and share knowledge and Experiences with others.
8) Visits to various clinic departments to gain the knowledge of various techniques used to study the functions of various systems.
9) Educational exchange programme.

I. Recommending reading :

Text book of Physiology :

- Text book of Medical Physiology – Guyton & Hall
- Review of Medical Physiology -- William Ganong
- Berne and Levy – Physiology
- S. Wright's Applied Physiology
- Vande's Human Physiology
- Best and Taylor
- Monographs
- Comparative Physiology – Prosser and Brown
- Biostatistics
- Medical Education Technology

Journals :

- Annual review of physiology
- American J. of Physiology
- Physiological review
- Recent advances in Physiology
- Indian J. of Phy. And other related clinical journals
- British Medical Bulletin

IV EVALUATION :

Formative –

The students will be assessed through out the course on following lines:

1) Attendance 2)Knowledge as tested by written, practical and viva examinations
2) Presentations in seminars 4) Relationship with colleagues, superiors, students staff members.

The 5 point scale is used	Points
Unsatisfactory	1
Satisfactory but needs improvement	2

Satisfactory	3
Good	4
Outstanding.	5

Regular feed back will be given to the P.G. students noting their strength, weaknesses and measures to improve.

Summative- Same as in preamble
The 6 points scale is used

Very poor	Zero
Poor	1
Below average	2
Average	3
Good	4
Very good	5
Outstanding	6

Heads of passing: A) Theory B) Practical C) Viva

Standard of Passing: a candidate shall obtain in each of the head of passing on average of minimum three points.

A) Theory examination : 4 Papers, each of 100 marks
Duration of each paper : 3 hrs.

Each paper will have 2 long questions and 2 short notes questions with 3 notes
(20 marks each) (10 marks each)

Paper I	General and cellular physiology, applied Biochemistry, Biophysics And Biostatistics
Paper II	Advanced systemic Physiology and environmental Physiology
Paper III	History of Physiology, Comparative Physiology and Applied Physiology
Paper IV	Recent advances, Medical Education Technology(MET), Medical ethics

Instruction regarding weightage given to each system be communicated to paper setter and examiners.

B) Practical Examination: 200 Marks

1) Amphibian and mammalian experiments, graphs,
2) Clinical case presentation and discussion.
3) Human experiments
4) Hematology experiments

Distribution of Marks (Practicals)

- Human experiment 25.
- Amphibian 25
- Mammalian 25
- Hematology 25

- Clinical Presentation 25
- Microteaching 25
- Viva 50

C) Viva Examination : Duration -1hour per student

1) General Viva	30 Minutes
2) Viva on dissertation	20 Minutes
3) Microteaching	10 Minutes

D) Internal assessment score obtained by the candidate throughout the course is to be communicated to the university.

BOM 28/2013, Dated 20/03/2013

Annexure - II

MGMIHS

MD (Physiology) – Syllabus of Practical

No.	Title of Practical
	PART – I : HAEMATOLOGY
01	The Microscope and Collection of Blood
02	Estimation of Hemoglobin content of Blood
03	W.B.C. Count
04	R.B.C. Count
05	Determination of Blood Groups, Blood Transfusion
06	Differential W.B.C. Count
07	Determination of Bleeding Time & Coagulation Time
08	Platelets / Thrombocytes
09	Reticulocyte Count
10	Determination of Erythrocyte Sedimentation Rate & Estimation of Packed Cell Volume
11	Anemia & Blood Indices
12	Osmotic fragility of red blood cells
	PART – II : CLINICAL PHYSILOGY
01	Introduction to Clinical Examination
02	Clinical examination of Arterial Pulse & Estimation of Venous Pressure
03	Measurement of blood flow by venous occlusion plathysmography
04	Determination of Arterial Blood Pressure
05	Clinical Examination of Cardiovascular system
06	Clinical Examination of Respiratory system
07	Artificial Respiration in Man
08	Clinical Examination of the Alimentary system And the Abdomen
09	Clinical Examination of Higher Functions
10	Clinical Examination of III, IV, VI Cranial Nerves
11	Clinical Examination of Other Cranial Nerves – I,V, VII, IX, X, XI, XII
12	Clinical Examination of Sensory System
13	Clinical Examination of Motor System-I
14	Clinical Examination of Motor System-II
15	Title of Practical
16	Tests for Hearing & Deafness
17	Clinical Examination of Eyes
18	Visual Reflexes
19	Activity of Vision
	PART – III " HUMAN PHYSIOLOGY
01	Cardiopulmonary Efficiency Tests
02	Electrocardiography (E.C.G.), Systolic time interval ,Stress test
03	Spirometry ,PFT (Flow-volume loop, FEV_1, PEFR)
04	Stethography
05	Ergography
06	Perimetry ,Colour Vision, Retioscopy, opthalmoscopy , Phacoscopy

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07	Reproductive system: Semen analysis , Pregnancy diagnostic tests
08	Body Temperature in Man
09	B.M.I. & balanced diet
10	Hand grip dynamometer
11	Autonomic function test
12	Polywrite D Machine
13	Nervous System a) Reaction time b) EEG c)Spectrum analysis of heart rate variability d) NCV, EMG, evoked potentials
14	Cystometry
	PART-IV : EXPERIMENTAL PHYSIOLOGY (Amphibian)
01	Introduction to experimental physiology and Study of instruments
02	Normal Cardiogram Effect of Temperature on Frog's Heart
03	Properties of Cardiac Muscle-I
04	Properties of Cardiac Muscle-II
05	Properties of Cardiac Muscle-III
06	Beneficial Effect
07	Nervous Regulation of Heart
08	Vagal Escape
09	Effect of Acetyholine on Frog's Heart
10	Effect of Adrenaline on Frog's Heart
11	Effect of Nicotine on Frog's Heart
12	Effect of various lons on isolated Frog's Heart
13	Simple Muscle Curve
14	Effect of Various Strengths of Stimuli
15	Effect of Load
16	Genesis of Tetanus
17	Phenomenon of Fatigue
18	Postural reflexes in frog
	PART- V : EXPERIMENTAL PHYSIOLOGY (Mammalian)
01	Experiments: (Fig. – Dale's bath, Dog dissection-experimental setup, langendorff's apparatus)
	PART-VI : CASE STUDIES
01	RS: obstructive – Bronchial asthma, TB
02	CVS: CHD, Vulvular lesions, CCF, RHD
03	Endocrine: Hyper or Hypothyroidism, Diabetes mellitus
04	Renal: Chronic renal disease
05	CNS: Hemiplegia
06	Reproduction : Infertility
07	Abdomen: Cirrhosis / Hepatosplenomegaly
08	Blood : Anemia
09	Special senses: cataract, Refractive errors, deafness
10	GIT: Peptic ulcer, acid peptic disease
11	General: PUO, obesity

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Resolution No.-3.1(d

ANNEXURE-II
BOM-45/2016

A) Present Pattern -

Paper I - General physiology, Cellular physiology, Applied Biochemistry, Biophysics and Biostatistics, History of Physiology, Comparative Physiology

BOM-45/2016

Paper II - Nerve muscle, Blood, Cardiovascular system, Respiratory System, Gastrointestinal system, Renal Physiology.

Paper III - Endocrine, special senses, Nervous system, Reproductive system

Paper IV - Exercise Physiology, Nutrition, recent advances, Medical education technology, stress relaxation, medical ethics & applied physiology

B) Proposed Pattern (MCI Competency Based PG Programme Booklet)

There should be 4 theory papers:

Paper - I	General physiology including History of physiology
Paper - II	Systemic physiology (system providing transport, nutrition and energy) including Comparative physiology.
Paper - III	Systemic physiology (system concerned with procreation, regulation and neural control)
Paper - IV	Applied Physiology including Recent advances

Paper – I : General & Cellular Physiology including Genetic Basic & Historical Perspectives;

1. Physiology of cell; various cellular mechanisms. Genetic control mechanisms.
2. Various principles involved in physiological phenomenon, e.g. haemodynamics, bio-electrical potentials, body fluids, methods of measurements.
3. Interaction of human body in ambient environment including high altitude and deep sea.
4. Sports physiology
5. Yoga & Meditation.
6. History of Physiology

Paper – II : Systemic Physiology (Systems providing Transport, Nutrition & Energy)

1. Blood & Immunity
2. Cardio Vascular System
3. Respiratory System
4. Gastro Intestinal Tract & Dietary requirements
5. Excretion, pH & water & Electrolyte balance
6. Comparative Physiology

Paper-III: Systemic Physiology (Systems concerned with procreation, regulation & neural control)

1. Reproduction & family planning/foetal & Neonatal physiology
2. Nerve-Muscle Physiology
3. Endocrine Physiology
4. Central Nervous System
5. Special Senses

Paper-IV: (Applied Physiology including Recent advances)

1. Patho-physiology pertaining to systemic physiology
2. Physiological basis of various Evaluation tests.
3. Statistics.
4. Recent advances.
5. Growth & Development including aging.

Resolution No. 3.1 (e)

ANNEXURE-III
BOM-45/2016

4.2 – Revision Marks distribution in M.D. (Physiology) Practical examination

There is disparity between present M.D. (Physiology) curriculum – practical marks distribution and MGMIHS M.D. (Physiology) Mark list proforma ~~(Annexure III a & III b)~~;

A) Present marks distribution -

Standard of Passing: a candidate shall obtain in each of the head of passing on average of minimum three points.

A) Theory examination : 4 Papers, each of 100 marks
Duration of each paper : 3 hrs.

Each paper will have 2 long questions and 2 short notes questions with 3 notes
(20 marks each) (10 marks each)

Paper I	General and cellular physiology, applied Biochemistry, Biophysics And Biostatistics
Paper II	Advanced systemic Physiology and environmental Physiology
Paper III	History of Physiology, Comparative Physiology and Applied Physiology
Paper IV	Recent advances, Medical Education Technology(MET), Medical ethics

Instruction regarding weight age given to each system be communicated to paper setter and examiners.

B) Practical Examination: 200 Marks

1) Amphibian and mammalian experiments, graphs,
2) Clinical case presentation and discussion.
3) Human experiments
4) Hematology experiments

Distribution of Marks (Practicals)

- Human experiment 25
- Amphibian 25
- Mammalian 25
- Hematology 25

[redacted]

C) Viva Examination - Duration 1 hour per student
1) General Viva 30 Minutes
2) Viva on dissertation 20 Minutes
3) Microteaching 10 Minutes

D) Internal assessment score obtained by the candidate throughout the course is to be communicated to the university.

B) M.D. (Physiology) Practical mark sheet proforma – (Alongwith further, it has been previously resolved for include 10% marks of Grand Viva for dissertation viva; which should be reflected in practical mark sheet proforma).

MGM INSTITUTE OF HEALTH SCIENCES, NAVI MUMBAI

MARKLIST FOR PRATICAL AND VIVA-VOCE EXAMINATION

EXAM CENTRE: _____ COURSE / EXAM: PG –

DATE OF EXAMINATION: _____ EXAMINATION FOR:-M.D. (PHYSIOLOGY)

Seat No.	1						2	3		Grand Total Practical Total=100 Marks (1+2+3
	Human Experiment	Amphibian	Mammalian	Haematology	Clinical Presentation	Total	Microteaching	Viva 100 Marks		
	50	50	50	50	50	250	50	Sub. Viva 90	Dis. Viva 10	

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

Decision – Resolved to change M.D. (Physiology) practical marks distribution as shown in above proforma.

M.G.M.I.H.S., NAVI MUMBAI

Annexure I

MGMMC/Phy/1311/2014

Date:-8.10.2014

LIST OF PHYSIOLOGY BOOKS FOR MD PHYSIOLOGY (POSTGRADUATE COURSE)

A. Text books

S.N.	Name of the book	Name of the Author
1.	Textbook of Medical Physiology	Guyton & Hall
2.	Ganong's review of medical physiology	Barrett & Barman
3.	Physiological basis of medical practice	Best & Taylor
4.	Physiology	Berne & Levy
5.	Textbook of Physiology Volume 1& 2	Harry D. Patton
6.	Medical Physiology, Updated Edition	Boron
7.	Textbook Of Medical Physiology	Indu Khurana
8.	Samson Wright's Applied Physiology	Cyril A. Keele
9.	Vander's Human Physiology	Eric P. Widmaier, Hershel Raff
10.	Exercise Physiology: Nutrition, Energy, and Human Performance	William D. McArdle B. S.
11.	Animal Physiology: Adaptation and Environment	Knut Schmidt-Nielsen

B. Practical books

S.N.	Name of the book	Name of the Author
1.	Practical Physiology	A. K. Jain
2.	Textbook of practical Physiology	C. L. Ghai
3.	Practical Physiology	G. K. Pal
4.	Textbook of practical Physiology	V. D. Joshi
5.	Hutchison's Clinical Methods	Donald Hunter
6.	MacLeod's Clinical Examination	Douglas & Nicol & Robertson

The above list of books is recommended by Board of studies for MGMIHS University.

Dr. R. S. Inamdar
Dr. Sangita Phatale
MGM Medical College,
Navi Mumbai & Aurangabad

To
Dr. Deepak A. D.
Chairman
Board of Studies
MGMIHS
Professor & Head
Department of Biochemistry,
M.G.M. Medical College,
Kamothe, Navi Mumbai.

(Approved in BOM 38/2014, dated 28/11/2014)

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. (PHYSIOLOGY)**

Seat No.	1						2	3			Grand Total Practical Total =400 Marks (1+2+3)
	Human Experiment	Amphibian	Mammalian	Haematology	Clinical Presentation	Total	Microteaching	Viva-Voce			
	50	50	50	50	50	250	50	Viva 90	Dissertation Viva 10	Total 100	

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

Paperwise Distribution of Topics

v)	M.D.	PAEDIATRICS	I.	Basic Medical Sciences as applied paediatrics
			II.	Neonatology, Community and preventive Paediatrics
			III.	Systemic diseases in Paediatrics: - Respiratory Cardiology, C.V.S., Neurology, Haematology, Nephrology, Rheumatology, Immunology, Metabolic, Liver Gastroenterology, Growth and Development, Congenital and acquired disorders Endocrine System and Miscellaneous diseases.
			IV.	Recent advances in Paediatrics
vi)	M.D.	PHYSIOLOGY	I.	General physiology, Cellular physiology, Applied Biochemistry, Biophysics and Biostatistics, History of Physiology, Comparative Physiology
			II.	Nerve muscle, Blood, Cardiovascular system, Respiratory System, Gastrointestinal system, Renal Physiology.
			III.	Endocrine, special senses, Nervous system, Reproductive system
			IV.	Exercise Physiology, Nutrition, recent advances, Medical education technology, stress relaxation, medical ethics & applied physiology.
vii)	M.D.	ANAESTHESIOLOGY	I.	Basic Sciences related to Anaesthesia (History, Anatomy, Physiology, Pharmacology, Pathology, Physics, Instrument & Equipments, etc.)
			II.	Theory & Practice of Anaesthesia
			III.	Clinical sciences like Medicine & Surgery Related to Anaesthesia
			IV.	Recent Advances in Anaesthesia.

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

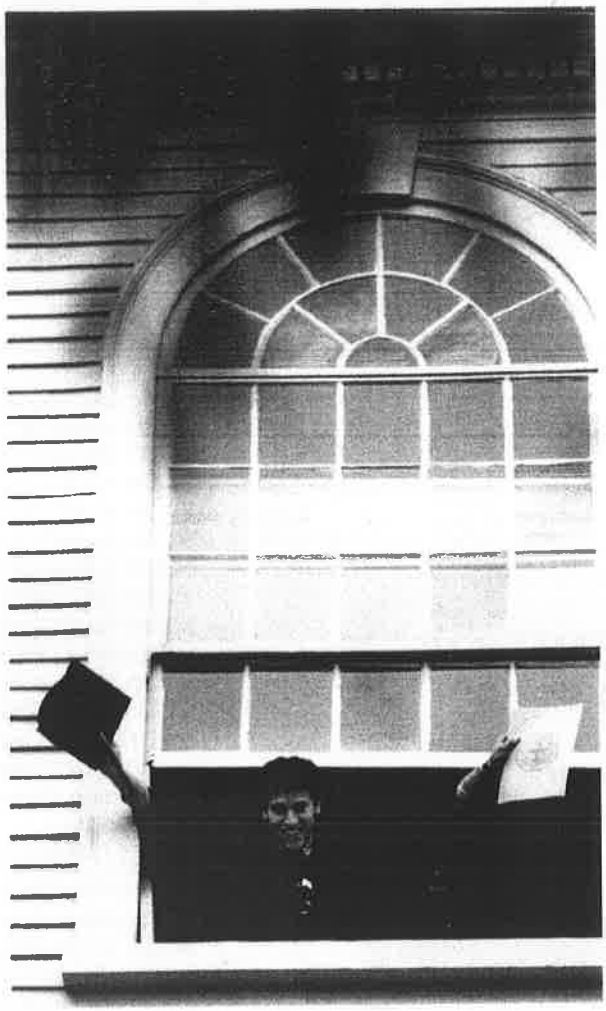
- MGM's College of Engineering
- MGM's College of Fine Arts
- MGM's College of Computer Science
- MGM's College of Journalism & Media Science
- MGM's Centre for Astronomy & Space Tech.
- MGM's College of Library & Information Science

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:

PG, Physiology syllabus

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

MD Physiology-Second Year - PG Topics-50

S.N.	Systems		No. of Topics
I	**Alimentary system**		4
	1. Gastric secretion	2. Pancreatic secretion	
	3. Intestinal movements	4. Hepatobiliary system and jaundice	
II	**Metabolism**		7
	1. Carbohydrate metabolism	2. Protein metabolism	
	3. Fat metabolism	4. Vitamins	
	5. Antioxidants	6. Fluid & electrolyte balance	
	7. Acid base balance		
III	**Reproduction**		2
	1. Physiology of pregnancy and lactation	2. Infertility, investigations, Recent advances	
IV	**Alimentary system**		5
	1. Peptic ulcer	2. Secretions of small intestine	
	3. Digestion and absorption of carbohydrates, proteins & fats	4. Balanced diet	
	5. Obesity		
V	**Cardiovascular system**		14
	1. Overview of cardiovascular system	2. Cardiac impulse	
	3. Electrocardiogram (ECG)	4. Heart rate	
	5. Cardiac output	6. Haemodynamics	
	7. Blood pressure	8. Capillary circulation, tissue fluid formation	
	9. Coronary circulation	10. Shock	
	11. Cardiorespiratory changes in exercise	12. Pathophysiology of cardiac failure	
	13. Cardiac function test, stress test, echocardiography	14. Recent advances in cardiovascular system	
VI	**Respiratory system**		13
	1. Overview of respiratory system	2. Mechanics of respiration	
	3. Oxygen transport, oxygen dissociation curve	4. Carbon dioxide transport	
	5. Neural regulation of respiration	6. Chemical regulation of respiration	
	7. Hypoxia, oxygen therapy	8. Acclimatization to high altitudes	
	9. Pulmonary function tests	10. Deep sea physiology, dysbarism	
	11. Space physiology	12. Sports Physiology	
	13. Recent advances in respiratory physiology		
VII	**Medical Education Technology**		5
	1. Overview	2. Educational objectives	
	3. Teaching learning process	4. Evaluation	
	5. Educational planning & management		
			50

MD Physiology-First Year-PG Topics (50)

S.N.	Systems		No. of Topics
I	General physiology		6
	1. Homeostasis	2. Cell physiology	
	3. Transport across cell membrane	4. Body fluids	
	5. Bioelectrical potentials	6. Genetic control mechanism	
II	Environmental Physiology		3
	1. High altitude physiology	2. Space physiology	
	3. Deep sea physiology		
III	Nerves		7
	1. Bioelectrical potentials	2. Classification and properties of nerve fibers	
	3. Nerve injury, Degeneration and regeneration of nerve fibers	4. Bioelectrical potentials	
	5. Classification and properties of nerve fibers	6. EMG Nerve conduction studies	
	7. Action Potential		
IV	Muscles		7
	1. Mechanism of muscles contraction	2. Neuromuscular transmission	
	3. EMG & Nerve conduction studies	4. Mechanism of muscles contraction	
	5. Properties of skeletal muscle	6. Excitation contraction coupling	
	7. Comparison of 3 types of muscles, types of muscle fibers		
V	Blood		10
	1. Erythropoiesis	2. Anaemia	
	3. Immunity	4. Haemostasis & blood coagulation	
	5. Blood groups & blood transfusion	6. White blood cells	
	7. Platelets	8. Blood volume	
	9. Innate Immunity	10. Acquired immunity	
VI	Endocrines		6
	1. Anterior pituitary	2. Thyroid	
	3. Adrenal cortex	4. Blood glucose homeostasis	
	5. Calcium homeostasis	6. Physiology of growth	
VII	Reproduction		3
	1. Male reproductive system	2. Female reproductive system	
	3. Contraceptives & infertility		
X	Miscellaneous		3
	1. History of physiology	2. Evolution of body systems-I	
	3. Evolution of body systems-II		
XII	Research Methodology		5
	1. Basics of Medical Research	2. Study design & research protocol	
	3. Biostatistics	4. Ethical aspects	
	5. Presentation & publications		
		Total	**50**

MD Physiology-Third Year-PG Topics-50

S.N.	Systems		No. of Topics
X	**Excretory system**		8
	1. Overview of excretory system	2. Glomerular filtration	
	3. Mechanism of concentration & dilution of urine	4. Acid base balance	
	5. Fluid & Electrolyte balance	6. Renal function tests	
	7. Diuretics, dialysis peritoneal dialysis, haemodialysis, renal transplantation	8. Body temperature regulation	
XI	**Nervous system**		25
	1. Overview of nervous system	2. Neurotransmitters	
	3. Reflexes	4. Stretch reflex-Muscle spindle	
	5. Sensations	6. Pain	
	7. Spinal cord-organization, functions	8. Ascending pathways	
	9. Descending pathways-pyramidal tract	10. Extra pyramidal tracts	
	11. Spinal transection	12. Muscle tone	
	13. Equilibrium, vestibular apparatus	14. Cerebellum	
	15. Basal ganglia	16. Cerebral cortex	
	17. Reticular formation, EEG	18. Sleep & wakefulness	
	19. Speech	20. Memory	
	21. Hyporthalamus	22. Limbic system	
	23. Autonomic nervous system	24. Cerebral circulation	
	25. Pathophysiology of nervous system		
XII	**Special census**		11
	1. Visual acuity, errors of refraction	2. Accommodation in eye	
	3. Photochemistry of vision	4. Visual pathway, lesions of visual pathway	
	5. Neurology of vision	6. Functions of middle ear	
	7. Colour vision of colour blindness		
	9. Visual reflexes, movements of the eye ball	10. Ear-physics of sound, functional anatomy of ear	
	11. Cochlea, organ of Corti, auditory pathway		
	Applied physiology		6
	1. Exercise Physiology	2. Pathophysiology of systems	
	3. Sports Physiology	4. Comparative Physiology	
	5. Recent advances in Physiology	6. Applied Biochemistry	
		Total	50

1. The scheduling of topics should be done as per requirement during three years of MD (Physiology) course.
2. The topics will be conducted as lectures / discussion / seminar / presentation being facilitated by the faculty.

All PG syllabus

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

All PG.
30 copies

Resolution No. 1.3.23 of BOM-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)

MD Physiology

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:

2) **MD Physiology** -

a. Medicine (1 month)
b. Pathology & Diagnostic (1 month)
c. Elective (Cardiology / Neurology/Sleep Lab /Respiratory Medicine /Sports Medicine- as per availability & choice) (2 months)

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:

(ii) Physiology :

1. ICMR Ethical Guidelines
2. UNESCO Bioethics Guidelines
3. Professionalism

(iv) Further it was also resolved to include the above Bioethics 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.