



# **MGM INSTITUTE OF HEALTH SCIENCES**

(Deemed to be University u/s 3 of UGC Act, 1956)

**Grade 'A' Accredited by NAAC**

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## **Curriculum for M.Sc. Medical Pharmacology**

Amended upto BOM- 57/2019, dated 26/04/2019

## **Amended History**

1. Approved as per Item No. 4, of BOM – 23/2012, dated 30/03/2012.
2. Amended as per Resolution No. 3.3(d), of BOM – 43/2015, dated 06/11/2015.
3. Amended as per Resolution No. 3.6(k), of BOM – 45/2016, dated 28/04/2016.
4. Amended as per Resolution No. 5.25, of BOM – 48/2017, dated 24/01/2017.
5. Amended as per Resolution No. 1.3.7.11, Resolution No. 1.3.14.10, Resolution No. 1.3.14.13, Resolution No. 1.3.23, of BOM – 51/2017, dated 28/08/2017.
6. Amended as per Resolution No. 4.4.1.3, of BOM-55/2018 , Dated 27/11/2018
7. Amended as per Resolution No. 3.1.4.2 BOM- 57/2019, Dated 26/04/2019.

## M.Sc. Medical Pharmacology Syllabus & Curriculum

### SEMESTER - 1

#### Module 1:

- History of Pharmacology
- Definition – Drug, Pharmacology, Pharmacokinetics, Pharmacodynamics & Pharmacopoeia
- Sources of Drugs
- Routes of Administration of Drugs –Advantages & Disadvantages

#### Module 2:

##### Pharmacokinetics

- Drug Absorption
- Drug Distribution
- Drug Metabolism
- Drug Excretion

#### Module 3:

- Pharmacodynamics
- Types & Classes of drugs (eg Analgesic, Antipsychotics, Antimicrobial etc)  
Terminology

#### Module 4:

- Factors Modifying Drug Action
- Adverse Effects of drugs

#### Module 5:

- Drugs acting on Autonomic Nervous System
- Respiratory System Drugs
- Gastrointestinal Drugs

**Practical –**

- Formulation of Drugs (Dosage Form)
- Prescription writing
- Pharmacy Preparation: Solution, Suspension & Emulsion
- Information on Label (commercial)
- Bioavailability studies
- Dissolution test
- Disintegration test
- Sources of Drug Information

(Systemic Pharmacology will be Superficial & of the level of Orientation only in 1<sup>st</sup> & 2<sup>nd</sup> Semester)

## SEMESTER – 2

### Module 6:

- Drugs affecting Central Nervous System

### Module 7:

- Drugs affecting Cardiovascular System

### Module 8:

- Hormones and Antagonist

### Module 9:

- Drugs affecting Haemopoietic System (Anemia, Anticoagulant, Anti-platelet & Thrombolytic)

### Module 10:

- Chemotherapeutic Agents

### Module 11:

- Laboratory Animals –Rat, Mouse, Rabbit & Guinea Pig
- Experimental Pharmacology – Bioassay & Instruments for CNS Activity
- Chemical Pharmacology – Equipments: General Principles
- Radio-immunoassay

## SEMESTER – 3

### Module 12:

- Biostatistics, Computer Application

### Module 13:

- Research Methodology, Scientific Writing

\* (Dissertation Topic to be Selected & Approved)

### Module 14:

Clinical Pharmacokinetics

- C<sub>max</sub>, T<sub>max</sub>, AUC, Half Life, Volume of Distribution, Loading Dose, Maintenance Dose & TDM

### Module 15:

- General Pharmacology
- Drugs acting on Autonomic Nervous System (Detailed)
- Drugs acting on Cardiovascular System (Detailed)

### Module 16:

- Posting in Experimental Laboratory, Pharmacy Laboratory & Animal House

### Module 17:

- Drug Design and Discovery

### THIRD SEMESTER

## RESEARCH METHODOLOGY AND BIO STATISTICS

### Research Methodology

1. Introduction
2. - Research Design:- Correlational design, Experimental design, Internal & External validity, Threats to validity, components of research design, features of correlational & experimental design

- Observational studies:- Exploratory studies, Descriptive studies, Explanatory studies, cohort studies, case-control studies, Evaluative studies, Monitoring studies, Historical studies, Panel studies.

3. Methods of data collection:  
Sample survey- Stages of sample survey  
- Methods of survey

Sampling & Non sampling errors.

Interviewing for Data Collection  
-Types of interviews  
-Art of asking questions.

Questionnaire construction  
-Considerations of questionnaire construction  
-Features of questionnaire

Pre-test Interviews & Pilot studies

## Bio-Statistics

1. Introduction to statistics & Biostatistics & its application.
2. Data condensation & graphical methods.
  - Raw data, Attributes & variables, Discrete & continuous variables,
  - Principles of classification
  - Construction of frequency distribution, discrete & continuous frequency distribution, relative frequency distribution, cumulative frequency distribution.
  - Graphical presentation of data using: Histogram, frequency polygon, frequency curve, ogive curves.
  - Diagrammatic presentation of data using :simple bar diagram, multiple bar diagram, subdivided bar diagram, pie- diagram
  - Stem-leaf display
3. Measures of Central Tendency:
  - Need & features of good measure of central tendency.
  - Arithmetic mean, mode, median
  - Merits & demerits of mean, mode & median.
  - Graphical methods for mode & median.
  - Relation between mean, mode & median (Empirical Relation)
4. Measures of dispersion :
  - Need & characteristics of good measure of dispersion
  - Range, mean deviation, standard deviation, variance, C.V.
  - Merits & demerits of range, Mean deviation, Standard deviation, variance C.V.
  - Sampling variability & Significance, Hypothesis testing
  - Normal distribution & its properties, Hypothesis, Types of hypothesis, Type I error, Type II error, level of significance, P-value, one-tailed test, two tailed test.
  - Significance of difference in Mean & proportion for large samples & small samples.
  - SEM (Standard Error of Mean) uses & its applications
  - SEDM ( Standard Error of Differences in Means)
  - t-test -(paired t-test, unpaired t-test)
  - ANOVA
  - Chi-square test
  - Standard Error of Proportion (SEP) & Standard Error of Difference in Proportion (SEDP) & its uses and applications.
5. Vital Statistics:



## SEMESTER – 4

### Module 18:

- Drug Addiction and Poisoning

### Module 19:

- Endocrinology and Antibiotic Chemotherapy (Detailed)

### Module 20:

- Drugs acting on Central Nervous System (Detailed)

### Module 21:

- Animal Ethics & CPCSEA Guidelines
- Drug Toxicity Studies
- LD50 determination
- Screening of Drugs (General)
- Structure Activity Relationship (General)
- Bioassay Experiment Demo

## SEMESTER – 5

### Module 22:

- Drug Discovery & Drug Development (Phases of trials)
- Preclinical Studies
- Bio-pharmaceutics
- ICH- GCP Guidelines
- Pharmacovigilance

### Module 23:

- Preparation of Dissertation- Compilation, Analysis & Final Report writing

### Module 24:

- Ethics & Ethic Committee- Composition
- Belmont Report
- Nuremberg Code
- Helsinki Declaration
- IPR -Intellectual Property Right
- Visit to CRO, Pharmaceutical Industry or Scientific Laboratory

## SEMESTER – 6

### Module 25:

#### Drug Screening & Evaluation Methods

- Angina
- Hypertension
- Congestive Heart Failure
- Arrhythmias
- Bronchial Asthma
- Psychosis
- Mental Depression
- Epilepsy
- Diuretics
- Diabetes Mellitus
- Inflammation
- Pain

### Module 26:

- Pharmaco-economics
- Pharmaco-epidemiology
- Ocular Pharmacology
- Dermato-Pharmacology
- Ethical Review of Scientific Research Project/Paper
- Writing Informed Consent Form & Patient Information Sheet

Department of Pharmacology  
MGM Medical College, Kamothe  
Navi Mumbai

M.SC (Pharmacology)  
Syllabus for Practicals

Semester 1

- Introduction to Practical Pharmacology
- Prescription Writing
- Pharmacokinetics-I
- Routes of Administration-Oral
- Routes of Administration-Topical
- Routes of Administration-Parenteral

Semester 2

- Pharmacokinetics-II
- Pharmacodynamics-I
- Pharmacodynamics-II
- Screening Techniques for New Drugs
- Adverse Drug Reactions
- Sources of Drug Information

### Semester 3

- Clinical Pharmacokinetic Parameters
  - Volume of distribution
  - Plasma half life
  - Clearance
- Dosage forms
- Pharmacy
  - Antipyretic Solution
  - Mist alba Suspension
  - Liquid Paraffin Emulsion
  - Calamine lotion
  - Turpentine liniment
  - ORS
  - Whitfield's ointment

### Semester 4

- \* Bioassay
  - o Dose response Curve
  - o Methods of Bioassay
    - \* Direct Matching
    - \* Interpolation
- \* LD50 estimation
- \* Experimental Pharmacology Graphs
  - o Ceiling effect
  - o Physiological and Competitive antagonism
  - o Potentiation
  - o Tachyphylaxis
  - o Nicotinic action of Acetylcholine
  - o Dales Vasomotor Reversal

12/1/17

### Semester 5

- Clinical research
  - Writing of Case Record form
  - Writing of Informed Consent form
  - Protocol Writing
- Instrumentation
  - Rota Rod
  - Cook's Pole Climbing Apparatus
  - Eddy's hot plate
  - Plethysmograph
  - Actophotometer
  - Langendorff apparatus
  - Disintegration time apparatus
  - Dissolution time apparatus

### Semester 6

- Thesis Presentation
- Animal handling
- Short Procedures
  - Oral feeding
  - Intraperitoneal injection
  - Subcutaneous injection
  - Tail vein injection
  - Rabbit ear vein



## M.Sc. Medical Courses

### Exam Pattern

The new suggested exam pattern which is common for all subjects is as follows.

- There will one **final university exam** at the end of every semester.
- **Internal exam** will be conducted at the college level for 1<sup>st</sup> and 2<sup>nd</sup> semesters with a common time table and for 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> and 6<sup>th</sup> semesters at the departmental level. The marks scored will be used for calculating the internal assessment as described on page 4, 5.

**Marks scheme for the University exam:**

Final theory marks will be 80 marks (60marks University Theory exam + 20 Marks Internal assessment).

The existing University Theory exam pattern should be modified.as follows:

**Existing Scheme:**

Question	Mark distribution	Total marks (60)
Sec:A:MCQ	20X0.5M	10
Sec:B: SAQ	10/11 x 4M	40
Sec C: LAQ	1/ 2 x 10 M	10
		Total= 60 M

**Modified scheme: ( This gives equal weightage to sec B and Sec C)**

Question		Mark distribution	Marks allotted per section	Marks
Sec:A	MCQ	10X 1 M =10	10	10
Sec:B	SAQ	3/ 4 x 5 M =15	15	25
	LAQ	1/ 2 x 10 M =10	10	
Sec : C	SAQ	3/ 4 x 5 M =15	15	25
	LAQ	1/ 2 x 10 M =10	10	
				Total= 60 M

Final practical marks will be 70M.(50 marks University practical exam + 20 Marks Internal assessment)

Practical exam pattern : Total 50 marks with following break up.

Exercise	Description	Marks
Q No 1.	Practical exercise	15 M
Q No 2	Station exercise	5x 5M =25 M
Q No 3	VIVA	10 M
		Total= 50 M

Calculation of Internal assessment: there will be 20 marks each towards internal assessment in theory and practicals. This should be submitted by respective departments atleast 15 days before university exam to the university ( exam section)

Break up of Theory IA calculation for 20marks

Internal exam(at department)	10 marks
Attendance	5 marks
Seminar	5marks
	Total= 20 M

Break up of Practicals IA calculation:

Internal exam(at department)	10 marks
Attendance	5 marks
Journal	5marks
	Total= 20 M

Exam pattern for Internal exam Theory: ( 30 marks) to be converted to 10 marks.

Question	Mark distribution	Total marks (30)
Sec:A:MCQ	10 x1M	10
Sec:B: SAQ	2 /3 x 5M	10
Sec C: LAQ	1/ 2 x 10 M	10
		Total= 30 M

Exam pattern for Internal exam Practical (30 marks) to be converted to 10 marks.

Exercise	Description	Marks
Q No 1.	Practical exercise	10 M
Q No 2	Station exercise	10 M
Q No 3	VIVA	10 M
		Total= 30 M

5 marks allocated for Attendance in theory and 5 marks for attendance in practicals.

It was decided that weightage be given to attendance as per following scheme:

Attendance percentage	Marks
<75	Zero
75	2.5
76-80	3.0
81-85	3.5
86-90	4.0
91-95	4.5
96-100	5.0

5marks for Seminar presentations ( to be added to theory internal assessment) and 5marks for Journal ( to be added to Practical Internal assessment).

#### Regarding exam marks distribution in VI Semester (3 year courses)

It was proposed that for the final semester ie 6<sup>th</sup> Sem in 3 year courses, the same mark distribution should be kept for practical exams.

Out of 50 marks practicals, break up will be as follows:

Exercise	Description	Marks
Q No 1.	Practical exercise	15 M
Q No 2	Dissertation presentation	25
Q No 3	VIVA	10 M
		Total= 50 M

#### Dissertation:-

M.Sc. (Medical Courses) student should submit a suitable dissertation topic forwarded by the guide to the School of Biomedical Sciences by 16<sup>th</sup> September in III Semester of the course. Following approval of ethics & scientific committee, work should be carried out.

Completed dissertation should be submitted by 31<sup>st</sup> march in VI Semester.

Practical:

	OBGY.	General Surgery
VI <sup>th</sup> / VIII <sup>th</sup> Sem. & Prelim Exam.	15	20
Day to day assessment as per MCI norms	05	10
Total marks	20	30

**Resolution No. 3.4(e):** Resolved to accept Academic Calendar for UG (III MBBS Part 2) and PG course 2016-17. [Annexure – V of BOM-45/2016]

**Resolution No. 3.5:** It was resolved to start Fellowship course in Clinical Nephrology at MGM Medical College, Aurangabad from June 2016 as per the syllabus. [Annexure – X of BOM-45/2016]

✓ **Resolution No. 3.6(f):** It was resolved to accept Human Anatomy journal for 1<sup>st</sup> year B.Sc. students of Paramedical courses to be implemented from 2016-17 Batch onwards. [Annexure – XI of BOM-45/2016]

✓ **Resolution No. 3.6(g):** It was resolved to accept Microbiology Journal [Annexure - XII (A) & (B) of BOM-45/2016] & Microbiology Log book [Annexure - XIII (A) & (B) of BOM-45/2016] for B.Sc. MLT 2<sup>nd</sup> & 3<sup>rd</sup> year courses to be implemented from 2016-17 Batch onwards and old batches as well.

✓ **Resolution No. 3.6(h):** It was resolved to accept journal [Annexure - XIV of BOM-45/2016] & log book [Annexure - XV of BOM-45/2016] for 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> year of M.Sc. Medical Anatomy courses to be implemented from 2016-17 new Batch onwards and as well as for Students who have taken admission in 2015-16 and will be entering into their 2<sup>nd</sup> year in 2016-17.

✓ **Resolution No. 3.6(i):** It was resolved to accept journal [Annexure - XVI of BOM-45/2016] & log book [Annexure - XVII of BOM-45/2016] for 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> year of M.Sc. Medical Physiology to be implemented from 2016-17 new Batch onwards and as well as for Students who have taken admission in 2015-16 and will be entering into their 2<sup>nd</sup> year in 2016-17.

✓ **Resolution No. 3.6(j):** It was resolved to accept journal [Annexure - XVIII of BOM-45/2016] & log book [Annexure - XIX of BOM-45/2016] for 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> year of M.Sc. Medical Microbiology to be implemented from 2016-17 new Batch onwards and as well as for Students who have taken admission in 2015-16 and will be entering into their 2<sup>nd</sup> year in 2016-17.

✓ **Resolution No. 3.6(k):** It was resolved to accept log book [Annexure – XX of BOM-45/2016] for 1<sup>st</sup>, 2<sup>nd</sup> & 3<sup>rd</sup> year of M.Sc. Medical Pharmacology to be implemented from 2016-17 new Batch onwards and as well as for Students who have taken admission in 2015-16 and will be entering into their 2<sup>nd</sup> year in 2016-17.

(P.T.O)

**Resolution No. 3.2(d):** Resolved to delete the topics OSPE, Mal absorption, PUO, Gastric Analysis in Practical of Pathology (UG) for the batch of Students entering into 2<sup>nd</sup> MBBS from the academic year 2016-17 onwards.

**Resolution No. 3.2(e):** Resolved to add following Demos for UG Students (Pathology)-Histogram & CBC for the batch of Students entering into 2<sup>nd</sup> MBBS from the academic year 2016-17 onwards.

**Resolution No. 3.2(f):** Resolved that 10% of Practical marks in Grand Viva for PG examination be allotted for Dissertation Viva with immediate effect.

Keep in  
cut 9 of course  
MD/MS  
+ FTL

### 3.3 Medicine and Allied :

**Resolution No. 3.3(a):** Resolved to include,

- (i) Topics in Chest Medicine : ARDS, OSA and Pulmonary Thrambo-Embolism which should be covered in two lectures.
- (ii) Care of Terminally ill patient under the heading of Geriatric Medicine.

For the batch of Students entering into 3<sup>rd</sup> MBBS (Part-I) from February 2016 onwards.

**Resolution No. 3.3(b):** Resolved to approve the changes in syllabus of MD Geriatric Medicine (Annexure-IX) with immediate effect.

**Resolution No. 3.3(c):** Resolved to approve the changes in syllabus of MD in Emergency Medicine (Annexure-X) with immediate effect.

**Resolution No. 3.3(d):** Resolved that the basic research methodology should be taught to UG and PG students for all courses as per their regulatory Council Norms.

Keep in  
cut 11, 14 & 16  
courses

**Resolution No. 3.3(e):** Resolved to accept the proposed pattern of redistribution of the marks in Dermatology and Psychiatry subjects in theory papers of Medicine subject at MBBS level for the batch of Students entering into 3<sup>rd</sup> MBBS (Part-II) from February 2016 onwards, as given below:

The change in Paper 2 section C should be as under:

Section C (Marks 10)

C1 Psychiatry Section (Marks 10)

Question 1 – long question (Marks 4)

Question 2- short answer question attempt any 2 (Marks 6)

- a.
- b.
- c.

C2 Dermatology Section (Marks 10)

Question 1 – long question (Marks 4)

Question 2 – Short answer question attempt any 2 (Marks 6)

- a.
- b.
- c.

✓ **Resolution No. 3.3(f):** Resolved to adopt the change in internal assessment pattern of Community Medicine (Annexure-XI) for the batch of Students entering into 2<sup>nd</sup> MBBS from August 2016 onwards.

✓ **Resolution No. 3.3(g):** Resolved to start Certificate Course and Fellowship in Critical Care Medicine (Annexure-XII) at MGM Medical College, Navi Mumbai from academic year 2016-17. Therefore, Dean, MGM Medical College, Navi Mumbai is requested to work on the feasibility and other regulatory norms to start this course.

✓ **Resolution No. 3.3(h):** Resolved to start Certificate Course and Fellowship in Sleep Medicine (Annexure-XXVIII) at MGM Medical College, Navi Mumbai from academic year 2016-17. Therefore, Dean, MGM Medical College, Navi Mumbai is requested to work on the feasibility and other regulatory norms to start this course.

✓ **Resolution No. 3.3(i):** Resolved to approve the Examination pattern for MD in Immuno-Haematology & Blood Transfusion (Annexure-XIII) with immediate effect.

**3.4 Surgery and Allied :**

**Resolution No. 3.4(a):** Resolved that :

- (i) Topic of Polytrauma and its management be included in the Orthopedic UG syllabus in consultation with Surgery Department for the batch of Students entering into 3<sup>rd</sup> MBBS (Part-II) from February 2016 onwards.
- (ii) Following Topics be excluded from the Orthopedic UG syllabus for the batch of Students entering into 3<sup>rd</sup> MBBS (Part-II) from February 2016 onwards :
  - a) Acute poliomyelitis
  - b) Fungal infection and Leprosy in orthopedic
  - c) Cerebral Palsy and rehabilitation

**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]**

**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

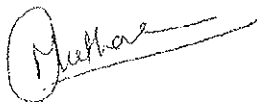


Resolution No. 1.3.14.10 of BOM-51/2017: Resolved to undertake Industrial visits as Career Provision for all students pursuing M.Sc.(2 yr & 3 yr) courses. [Annexure XXXIV]

Annexure 7.3

Industrial visits/hospital visit for M.Sc Medical approved by the BOS members and to be included in the existing syllabus and should be implemented in the new academic year.

Industrial visit	
Course	Criteria
MSc - 2 year/3 year Medical MSc courses	<ul style="list-style-type: none"><li>• Final year students</li><li>• 1 week program</li><li>• Visit to 2/3 Govt. recognized research institutes / Industries / hospitals.</li><li>• Within or out of state</li><li>• Cost to be borne by the students</li><li>• Two faculty to accompany students</li></ul>



All M.Sc. medical  
courses

**Resolution No. 1.3.14.13 of BOM-51/2017:** Resolved to include "IPR and Bioethics" module in all B.Sc. (AHS) courses based on annual pattern in 1<sup>st</sup> year, M.Sc. (2 yr courses) in 4<sup>th</sup> semester and M.Sc. (3 yr courses) in 6<sup>th</sup> semester as an elective subject from batch admitted in 2017-18 onwards. [Annexure-XXXV]

Annexure 10.1

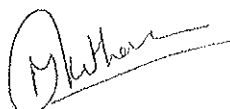
MSc Elective Module - Bioethics, IPR & Technology transfer

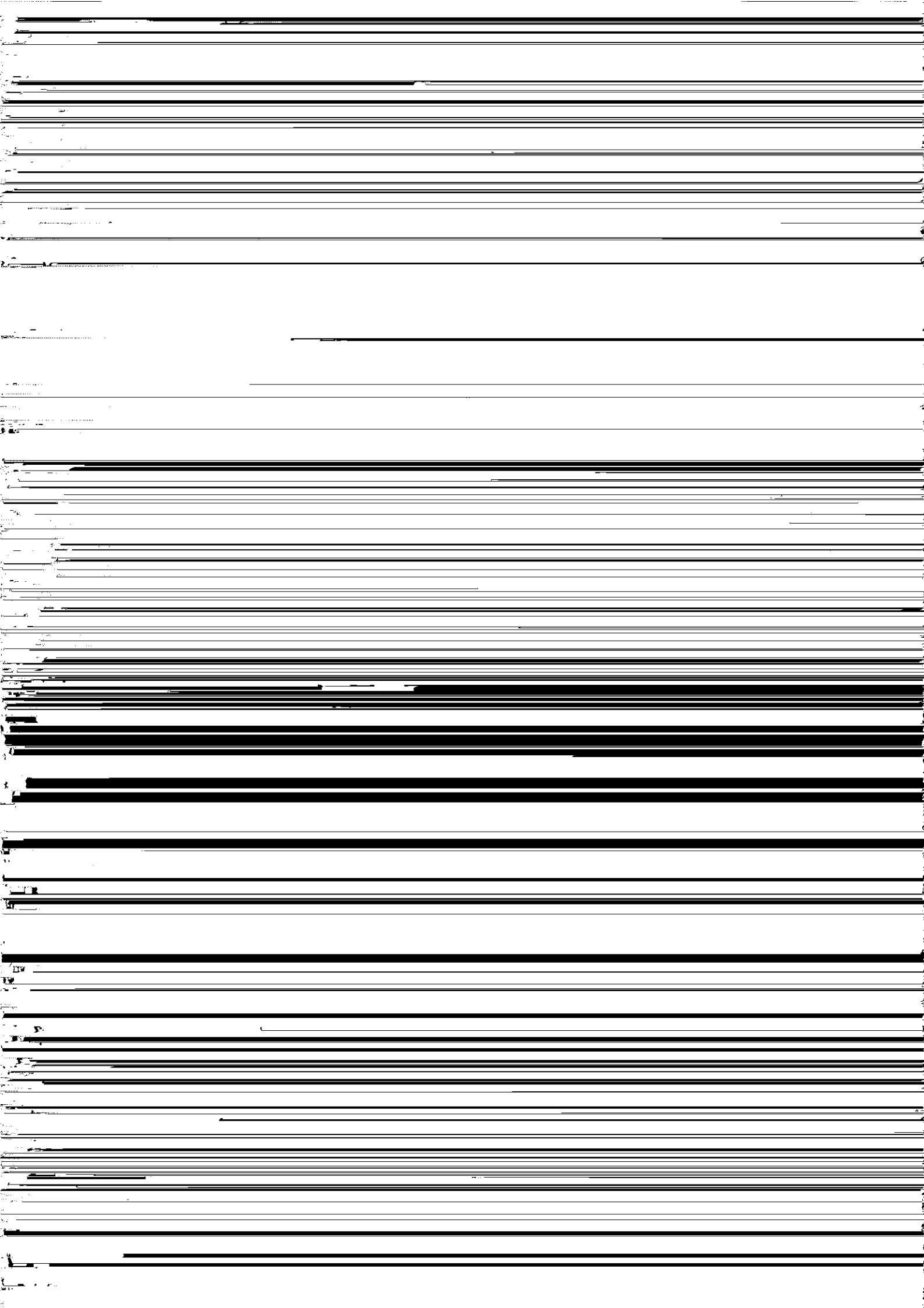
Contents:

Topic No.	Topics and Details	Theory
1	<b>Bioethics:</b> Bioethical issues related to Healthcare & medicine Food & agriculture Genetic engineering, Disposal of investigative material, integrity, Internet ethics, Human dignity, Privacy and confidentiality, Risk minimization, Drug information services, Animal ethics	6
2	<b>Introduction to Intellectual Property:</b> Concept of Intellectual Property Kinds of Intellectual Property Patents, Copyrights, Designs, Trademarks, Geographical Indication, Infringement of IPR, Its protection and Remedies Licensing and its types	3
3	<b>International Scenario:</b> Introduction to the leading international instruments concerning intellectual property rights, The Berne Convention, GATT, WTO, Indian Patent Act, Universal Copyright Convention, The Paris Convention, TRIPS, The World Intellectual Property Rights Organization (WIPO), Budapest treaty.	3
4	<b>Patents:</b> Requirement of patentable novelty, Inventive step, Prior art Classifying products as patentable and non-patentable Procedure for applying for patent, Patent Infringement and related case studies, Biological Patentability	3
<b>Total</b>		<b>15 lect.</b>

Reference books:

1. Intellectual property rights- Ganguli-Tat McGrawhill. (2001) ISBN-10: 0074638602,
2. Intellectual Property Right- Wattal- Oxford Publication House.(1997) ISBN:0195905024.
3. Encyclopedia of Bioethics 5 vol set, (2003) ISBN-10. 0028657748
4. Contemporary issues in bioethics – Beauchamp & Walters (B&W) 4<sup>th</sup> edition.
5. Classic philosophical questions by Gloude (8<sup>th</sup> Edition)
6. Case book series and booklets by UNESCO Bioethics Core curriculum 2008





All PG,  
Be copies

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

✓

10/17



MGM INSTITUTE OF HEALTH SCIENCES  
Navi Mumbai

**Induction Program for newly admitted Postgraduate students**

Day 1	<ul style="list-style-type: none"> <li>• Address by Dean, Medical Suptd, Director (Academics)</li> <li>• Pre-test</li> <li>• Communication Skills</li> <li>• Universal Safety Precautions</li> <li>• Biomedical Waste Management</li> <li>• Infection Control Policy</li> </ul>
Day 2	<ul style="list-style-type: none"> <li>• Emergency services</li> <li>• Laboratory services</li> <li>• Blood Bank services</li> <li>• Medicolegal issues</li> <li>• Prescription writing</li> <li>• Adverse Drug Reaction</li> <li>• Handling surgical specimens</li> </ul>
Day 3	<ul style="list-style-type: none"> <li>• Principles of Ethics</li> <li>• Professionalism</li> <li>• Research Ethics</li> <li>• Informed Consent</li> <li>• Confidentiality</li> <li>• Doctor-Patient relationship</li> </ul>
Day 4	<ul style="list-style-type: none"> <li>• Research Methodology</li> </ul>
Day 5	<ul style="list-style-type: none"> <li>• Synopsis writing</li> </ul>
Day 6	<ul style="list-style-type: none"> <li>• Dissertation writing</li> <li>• Statistics</li> </ul>
Day 7	<ul style="list-style-type: none"> <li>• ATLS</li> <li>• Post-test</li> </ul>

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)

All PG Courses  
admitted in AY 2018-19  
SBS

**Resolution No. 4.4.1.3 of BOM-55/2018:** Resolved to approve the revised syllabus of 'Research Methodology and Biostatistics' subject for all the PG courses (including 3 years) and to shift it in 2nd semester with effective from the batch admitted in the Academic Year 2018-19 onwards under MGM School of Biomedical Sciences. **[Annexure-13]**



Mansee Thakur &lt;mansibiotech79@gmail.com&gt;

Annexure-13

**To compulsorily include in the BOS agenda**

1 message

Registrar &lt;registrar@mgmuhs.com&gt;

6 September 2018 at 14:17

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Cc: registrar@mgmuhs.com, mgmihsaurangabad@gmail.com, dr.rajeshkadam07@gmail.com, aradmin@mgmuhs.com

Dear Sir/Madam,

Please find attached herewith request from Dr. Rita Abbi, Professor, Biostatistics regarding Modification in the syllabus of 'Research Methodology and Biostatistics' subject and Proposal to make this subject compulsory in all the PG courses. You are requested go through this and include it in your agenda for forthcoming BOS in September, 2018.

Thanks and regards,

**Dr. Rajesh B. Goel**

Registrar

MGM Institute of Health Sciences, Navi Mumbai

(Deemed University u/s 3 of UGC act, 1956)

3rd Floor, MGM Educational Campus,

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**Modification in the syllabus of Research Methodology and Biosta.pdf**  
2261K



21-

**MGM SCHOOL OF BIOMEDICAL SCIENCES, NAVI MUMBAI**

(A constituent unit of MGM INSTITUTE OF HEALTH SCIENCES)

(Deemed University u/s 3 of UGC Act 1956)

Grade "A" Accredited by NAAC

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Email. [sbsnm@mgmuhhs.com](mailto:sbsnm@mgmuhhs.com) / Website : [www.mgmsbsnm.edu.in](http://www.mgmsbsnm.edu.in)

To,  
The Director  
MGM School of Biomedical Sciences  
Kamothe,  
Navi Mumbai – 410 209

7-6-2018  
25

**Subject:** Modification in the syllabus of 'Research Methodology and Biostatistics'  
Subject and Proposal to make this subject compulsory in all the PG courses

Dear Madam,


Research Methodology and Biostatistics subject is a significant tool for academic research. It has been observed that majority of post graduate courses have this subject as a part of their course work. There is a need to modify the curriculum of 'Research Methodology and Biostatistics subject' due to the following reasons:

1. While going through the Research Methodology and Biostatistics syllabus it was found that in some courses more weightage was given to computer hardware e.g. History and development of computers(old pattern) which may not be needed now as we have witnessed the revolution in Information Technology. Students should be taught latest technology and software.
2. Secondly, in most of the syllabi 'Vital Statistic' is missing which is an important topic for healthcare field. Some of the essential topics like 'Normal distribution' etc are missing.
3. By streamlining the syllabus it will save teacher's teaching time, paper setting time. Moreover, Exam section need not call multiple examiners for the same subject, this will be economical for exam section.

This subject is well recognized as an essential tool in medical research, clinical decision making, and health management. It is recommended to streamline the syllabus and make **Research Methodology and Biostatistics' compulsory in all the post graduate courses of School Biomedical Sciences.** The modified syllabus is enclosed.

This is for your kind perusal and necessary action please.

With regards,

  
Dr. Rita Abbi  
Professor, Biostatistics

Copy for information to  
Registrar MGMIHS Navi Mumbai;  
✓ Hon'ble Vice Chancellor, MGMIHS Navi Mumbai  
Hon'ble Medical Director, MGM Medical College

*seen.*  
BOS → Faculty → Academic  
Council.

*27/6*

MGM Institute Of Health Sciences  
INWARD NO. 5720  
DATE: 25/6/18  
REF: TC

*27/6*  
*presenting to break*  
*All chairs persons of all boards*  
*27/6 12:30 - 1:00*  
*27/6*

**MGM INSTITUTE OF HEALTH SCIENCES**

**M. Sc. Students**

**Syllabus for Research Methodology and Biostatistics**

		No. of Hours	
<b>I. Research Methodology:</b>		Theory	Practical
1	<b>Scientific Methods of Research :</b> Definition of Research, Assumptions, Operations and Aims of Scientific Research. Research Process, Significance and Criteria of Good Research , Research Methods versus Methodology, Different Steps in Writing Report, Technique of Interpretation, Precaution in interpretation, Significance of Report Writing, Layout of the Research Report	5	—
2	<b>Research Designs:</b> Observational Studies: Descriptive, explanatory, and exploratory, Experimental Studies: Pre-test design, post-test design, Follow-up or longitudinal design, Cohort Studies, Case Control Studies, Cross sectional studies, Intervention studies, Panel Studies.	5	—
3	<b>Sampling Designs :</b> Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs (Probability sampling and non probability sampling), How to Select a Random Sample?, Systematic sampling, Stratified sampling, Cluster sampling, Area sampling, Multi-stage sampling, Sampling with probability proportional to size, Sequential sampling.	5	4
4	<b>Measurement in research:</b> Measurement Scales, Sources of Error in Measurement, Tests of Sound Measurement, Technique of Developing Measurement Tools, Scaling Meaning of Scaling, Scale Classification Bases, Important Scaling Techniques, Scale Construction Techniques, Possible sources of error in measurement, Tests of sound measurement	5	5
5	<b>Methods of Data Collection:</b> Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	5	3
6	<b>Sampling Fundamentals :</b> Need and importance for Sampling, Central Limit Theorem, Sampling Theory, Concept of Standard Error, Estimation, Estimating the Population Mean Estimating Population Proportion, Sample Size and its Determination, Determination of Sample Size through the Approach Based on Precision Rate and Confidence Level.	5	3
<b>II. Biostatistics</b>			
1	<b>Data Presentation :</b> Types of numerical data: Nominal, Ordinal, Ranked, Discrete and continuous. Tables: Frequency distributions, Relative frequency, Graph: Bar charts, Histograms, Frequency polygons, one way scatter plots, Box plots, two way scatter plots, line graphs	3	4
2	<b>Measures of Central Tendency and Dispersion :</b> Mean, Median, Mode Range, Inter quartile range, variance and Standard Deviation, Coefficient of variation, grouped mean and grouped standard deviation (including merits and demerits).	3	4

3	<b>Testing of Hypotheses:</b> Definition, Basic Concepts, Procedure for Hypothesis Testing, Measuring the Power of a Hypothesis Test, Normal distribution, data transformation Important Parametric Tests, Hypothesis Testing of Means, Hypothesis Testing for Differences between Means, Hypothesis Testing for Comparing Two Related Samples, Hypothesis Testing of Proportions, Hypothesis Testing for Difference between Proportions, Hypothesis Testing for Comparing a Variance to Some Hypothesized Population Variance, Testing the Equality of Variances of Two Normal Populations.	6	
4	<b>Chi-square Test:</b> Chi-square as a Non-parametric Test, Conditions for the Application Chi-square test, Steps Involved in Applying Chi-square Test, Alternative Formula, Yates' Correction, and Coefficient by Contingency.	2	2
5	<b>Measures of Relationship:</b> Need and meaning, Correlation and Simple Regression Analysis	2	3
6	<b>Analysis of Variance and Covariance:</b> Analysis of Variance (ANOVA): Concept and technique of ANOVA, One-way ANOVA, Two-way ANOVA, ANOVA in Latin-Square Design Analysis of Co-variance (ANOCOVA), ANOCOVA Technique.	4	4
7	<b>Nonparametric or Distribution-free Tests:</b> Important Nonparametric or Distribution-free Test Sign test, Wilcoxon signed-Rank Test, Wilcoxon Rank Sum Test: Mann-Whitney U test Kruskal Walli's test, Friedman's test, and Spearman Correlation test.	3	4
8	<b>Vital Health Statistics:</b> Measurement of Population: rate, crude rate, specific rate, <i>Measurement of fertility</i> : specific fertility rate, Total fertility rate, <i>Reproduction rate</i> , Gross Reproduction Rate, Net Reproduction Rate, Measures related to mortality: Crude Death Rate (CDR) , Age-specific death Rate, Infant and child mortality rate, Measures related to morbidity.	4	6
9	<b>Computer Application</b> Use of Computer in data analysis and research, Use of Software and Statistical package. Introduction to SPSS. Importing data from excel, access, tab and comma separated files. Entering data, labeling a variable, coding and recoding a categorical and continuous variable. Converting data from string to numeric variables, sorting & filtering, merging, appending data sets. Frequencies, descriptive statistics, cross tabulations. Diagrammatic presentation include histogram, bar chart, pie chart, scatter diagram, box plot, line chart. Parametric test of hypothesis-one sample, Independent and paired sample t test, one way ANOVA & post HOC test. Testing for normality, Chi-square test with measures of association. Pearson correlation. Non parametric test	3	6
<b>Total hours</b>		60	60

**Resolution No. 3.1.4.2 of BOM-57/2019:**

- i.** Resolved to include “Gender Sensitization” into UG (from new batch 2019-2020) and PG (from existing batches) curricula. [**Annexure-21**]
- ii.** Resolved to align the module of “Gender Sensitization” with MCI CBME pattern for MBBS students.
- iii.** Resolved that Dr. Swati Shiradkar, Prof., Dept. of OBGY., MGM Medical College, Aurangabad will coordinate this activity at both campuses.

## **Annexure - 21**

**Gender sensitization for UG (2<sup>nd</sup> , 3<sup>rd</sup> , 8<sup>th</sup> semesters) and PG (3 hours)**

### **INCLUSION OF “ GENDER SENSATIZATION” IN CURRICULUM**

#### **Introduction :**

The health care provider should have a healthy gender attitude, so that discrimination, stigmatization, bias while providing health care will be avoided. The health care provider should also be aware of certain medico legal issues related with sex & gender.

Society particularly youth & adolescents need medically accurate, culturally & agewise appropriate knowledge about sex, gender & sexuality. So we can train the trainers for the same. It is need of the hour to prevent sexual harassment & abuse .

To fulfill these objectives, some suggestions are there for approval of BOS.

#### **Outline**

1)For undergraduates :- Three sessions of two hours each, one in 2<sup>nd</sup> term, one in 3<sup>rd</sup> term & one in 8<sup>th</sup> term.

2)For Faculties and postgraduates :- One session of two hrs .

3)For those want to be trainers or interested for their ownself, value added course, which is optional about sex, gender, sexuality & related issues.

### **Responsibility**

ICC of MGM, MCHA , with necessary support from IQAC & respective departments.

### **Details of undergraduate sessions**

#### **1)First session in 2<sup>nd</sup> term**

**Aim** – To make Students aware about the concept of sexuality & gender.

To check accuracy of knowledge they have,

To make them comfortable with their own gender identify & related issues.

To make them aware about ICC & it is functioning.

**Mode** – Brain storming , Interactive power point presentation experience sharing.

**Duration** – Around two hours

**Evaluation** – Feedback from participants.

#### **2)Second session in 3<sup>rd</sup> / 4<sup>th</sup> term**

**Aim** – To ensure healthy gender attitude in these students as now they start interacting with patients.

To ensure that the maintain dignity privacy while interacting with patients and relatives, particularly gender related.

To make them aware about importance of confidentiality related with gender issues.

To encourage them to note gender related issues affecting health care & seek solutions.

Mode – focused group discussions on case studies, Role plays & discussion.

--3--

Duration – Around two hours.

Evaluation – Feedback from participants.

Third session in 8<sup>th</sup> term.

**Aim** – To understand effect of gender attitudes on health care in various subjects.

To develop healthy gender attitude while dealing with these issues.

**Mode** – Suggested PBL by departments individually. ( In collaboration with ICC till faculty sensitization is complete)

**Evaluation** – Feedback

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**FOR POSTGRADUATES**

Session of 2-3 hrs preferably in induction program.

**Aim** – To introduce medically accurate concept of gender, sex, gender role & sex role.

To ensure healthy gender attitude at workplace.

To understand gender associated concepts on health related issues & avoid such bias while providing health care.

To make them aware about ICC & its functioning.

**Mode** – Interactive PPT

Role plays & discussion

**Duration** – 2 to 3 hrs

**Evaluation** – Feedback.



**FOR FACULTIES**

Session of 2 hours may be during combined activities.

**Aim** – To ensure clarity of concept about gender & sex.

To discuss effect of these concepts on health-related issues.

To identify such gender & sex-related issues in individual subject specialties.

To discuss methodology like PBL for undergraduate students when they are in 7<sup>th</sup>-8<sup>th</sup> semester.

**Mode** – Role play

    Focused group discussion

    Case studies

**Evaluation** – Feedback.

\*\*\*\*\*



# MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)

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