



# MGM INSTITUTE OF HEALTH SCIENCES

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

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## Syllabus for M. Sc. Medical Microbiology

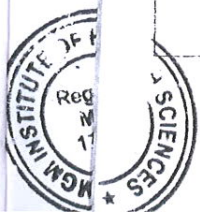
{Approved as per BOM. 23/2012, dated 30.03.2012, Item 4, MGMIHS, Navi Mumbai}

MGM MEDICAL COLLEGE, KAMOTHE, NAVI MUMBAI  
MICROBIOLOGY DEPARTMENT

M.SC. I<sup>ST</sup> SEMESTER - LECTURE+PRACTICAL SCHEDULE

(BASICS OF GENERAL MICROBIOLOGY)

Sr. No.	Topic	
	<u>Historical aspects</u> Definition of Medical Microbiology.- Concepts of disease, Evolution of Medical Microbiology. Important scientists & their contributions Leeuwenhoek, Louis, Lister, Robert Koch, Koch postulates.	
	<u>Classification of living beings.</u> Kingdom Protista. Prokaryotic & Eukaryotic cells, Units of measurement. Microscopy –Principles & parts of light microscope. Other types of microscopes. <b>(PRACTICAL AND DEMO)</b>	
	<u>Study of bacteria-</u> Wet mount, staining Methods- Grams stain, ZN stain, special stains. Size shape and arrangement of different bacteria. Classification of bacteria (Gm Pos & Neg) Examples of Acid fast orgs. <b>( 2 PRACTICALS AND DEMOS)</b>	
	<u>Structure of bacterial cell –</u> composition, function of various parts.(I)	
	Same (II)	
	<u>Growth and multiplication</u> of bacteria. Bacterial growth curve, nutritional and other growth requirements.	
	<u>Sterilization (I)</u> Need for sterilization, Definitions, Classification of physical agents with e.gs. <b>( DEMO OF LAB INSTRUMENTS)</b>	
	<u>Sterilization (II)</u> Details of autoclave and Hot air oven. Physical agents . <b>( DEMO OF LAB INSTRUMENTS)</b>	
	<u>Disinfection</u> (Classification, Mode of action and uses of common disinfectants). <u>Culture methods</u>	
	<u>Culture media (I)</u> <b>(DEMO OF COMMON MEDIA)</b>	



	Culture media (II) (DEMO OF COMMON MEDIA)	
	Identification of bacteria Biochemical tests –(I) (DEMO OF COMMON BIOCHEMICALS)	
	Biochemical tests (II) DEMO.	
	Antimicrobial Agents- Classification, Mode of action & List of antibiotics	
	Antibiotic sensitivity test.	
	Bacterial Genetics	
	Antibiotic resistance	
	Universal safety precautions Hospital waste disposal	
	Hospital acquired infections Infection control committee	

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MICROBIOLOGY DEPARTMENT

M.SC I<sup>ST</sup> SEMESTER – LECTURE+PRACTICAL SCHEDULE

(BASICS OF IMMUNOLOGY)

Sr. No.	Topic	
	<u>Infection-</u> Definition and various types. Sources of infection, modes of transmission, microbial pathogenicity and virulence factors, Exotoxins and endotoxins Basics of inflammation	
	<u>Immunity –</u> Definition, classification with examples. Vaccines and immunization schedule. Demonstration of vaccines.	
	<u>Antigens-</u> Chemical nature, classification with examples.	
	Antibodies- Chemical nature, types, functions.	
	Complement- Chemical nature, function.	
	<u>Serological reactions –</u> Classification, principles and uses.	
	<u>Demonstration of –</u> Widal, VDRL, ASO, CRP, RA, test HIV, ELISA, HCV, HBsAg, Dengue, Tuberculin Syringe, Vaccines, Immunisation chart,	

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M.SC II<sup>ND</sup> SEMESTER-LECTURE + PRACTICALSCHEDULE

(BASICS OF MYCOLOGY, PARASITOLOGY AND VIROLOGY.)

Sr. No.	Topic	
	<u>BASICS OF MYCOLOGY –</u> Introduction, General features, structure, differences from bacteria. Classification – Morphological, systematic.	
	<u>Classification of fungal diseases</u> Broad outline of lab diagnosis along with specimen collection.  <u>Demo. Of common fungi –</u> Candida, Aspergillus, Cryptococcus.	
	<u>BASICS OF VIROLOGY –</u> Historical aspects, General properties of viruses, Structure, Composition, resistance.	
	<u>Cultivation of viruses,</u> Classification of viruses DNA and RNA Names of viruses and diseases caused.  <u>Demonstration of egg, Inoculation, tissue culture</u>	
	<u>Outline of diagnosis of viral diseases.</u> Specimen collection and transport.	
	<u>Details of HIV –</u> Structure of virus, modes of transmission, pathogenecity, clinical features, laboratory diagnosis, treatment. <u>Demonstration of Tridot , ELISA</u>	
	<u>Details Hepatitis B virus – as above.</u>  <u>Demonstration of IC tests , ELISA</u>	

Sr. No.	Topic	
	<u>BASICS OF PARASITOLOGY</u>	
	History- Few important aspects Definition and explanation of various terms. Parasite, host, symbiosis, commensalism, Parasitism. Parasitology, Classes of parasites, classes of hosts Scheme of study. Mechanism of injury, in host	
	<u>Classification of parasites-</u>  Protozoa & helminthes. General features of Protozoa- General features of amoebae and examples of parasites- list the diseases caused.	
	<u>General features of flagellates-</u> Example of Parasites – list the diseases caused.	
	<u>General features of sporozoa-</u> Examples, Morphology and list the diseases caused. Morphology, Life cycle, Pathogenicity and Lab. Diagnosis of malaria.	
	<u>General features of ciliates-</u> Example of parasites and list the diseases caused.	
	<u>General features of Helminths.</u> General features of Nematodes- examples of Parasites- list the diseases caused Morphology – Adult worm, Ova. Lesions Clinical features, & Lab. Diagnosis of Ascariasis	
	<u>General features of Cestodes-</u> Examples of Parasites- list the diseases caused. Morphology –Adult worms, Ova Def. & Int. Host, Lesions, Lab diagnosis of Tape worm	
	<u>General features of trematodes-</u> Examples of Parasites and list the diseases caused.	
	<u>Demonstration of</u> <u>Slides-</u> Malarial parasite - P.vivax , P.falciparum, <u>Specimens-</u> Round worm Tape worm (T.saginata & solium),	

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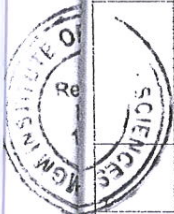
M.SC III<sup>RD</sup> SEMESTER- SYLLABUS

Details of General Microbiology, Immunology, Serology,  
Biostatistics & Research Methodology

Sr. No.	Topic	
	<u>DETAILS OF GENERAL MICROBIOLOGY</u>	
	Historical aspects, concepts of disease, Important scientist and their contributions.	
	<u>Classification of living being.</u> Kingdom Protista, Differences between pro and eukaryotic cells, Units of measurements of bacteria and viruses.	
	<u>Microscopy,</u> Different types of microscopes, use and care of microscope.	
	<u>Study of bacteria.</u> Wet mount examination. Staining – Gram stain, ZN stain, Albert stain, Capsular stain. Other stains.	
	<u>Structure and composition of bacterial cell.</u> – Functions of different parts. (I)	
	Same continued (II)	
	<u>Growth and multiplication of bacteria.</u> Bacterial growth curve, Nutritional and other growth requirements.	
	<u>Sterilization- I</u>	
	<u>Sterilization- II</u>	
	<u>Disinfection</u>	
	<u>Liquid culture media –</u> Preparation and sterilization. Inoculation and study media.	
	<u>Solid media-</u> Preparation and sterilization Inoculation and study of media.	



	<u>Culture methods -- Aerobic and anaerobic Cultures.</u>	
	<u>Biochemical reactions -</u> Preparation and sterilization. Performing tests.	
	<u>Biochemical reactions -</u> Preparation and sterilization, Performing tests.	
	<u>Antibiotic sensitivity test -</u> Performing and reporting the tests.	
	Universal safety precautions Hospital waste management.	
	Hospital acquired infections. Infection control committee	
	<u>Antimicrobial Agents-</u> Mode of action, classification, list of antibiotics Antibacterial	
	Antifungal Antiviral Antiparasitic-Antiprotozoal & Antihelminths	
	Bacterial genetics -I	
	Bacterial genetics -II	
	Antibiotic resistance	
	<u>DETAILS OF IMMUNOLOGY AND SEROLOGY.</u>	
	Infection	
	Immunity	
	Vaccines and immunization schedule	
	Antigens	
	Antibodies	
	Antibodies II	
	Complement	
	<u>Serological reactions -I</u>	
	Performing lab tests.	
	<u>Serological tests - II</u>	



	-Performing lab tests.	
	Serological tests -III	
	Performing lab tests.	
	Structure and functions of immune system.	
	Antibody mediated immune response	
	Cell mediated immune response	
	Hypersensitivity I and II	
	Hypersensitivity III and IV	
	Autoimmunity	
	Transplantation immunity	
	Tumour immunity	

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:

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M.SC IV<sup>TH</sup> TERM- SYLLABUS

(SYSTEMIC BACTERIOLOGY)

FORMAT OF STUDY -

Basic morphology, Classification of species – Non pathogenic and Pathogenic, Diseases caused. Main pathogen and disease, brief clinical features,  
Lab diagnosis – Specimen collection, preservation, transport, Sample processing in Lab. Isolation and identification by morphology, cultural characters, biochemical reactions, Specific identification tests, antibiotic sensitivity, Serological tests, prophylaxis, vaccines.

Sr.No.	Topic	
	Staphylococcus	
	Streptococcus	
	Pneumococcus	
	Gonococcus	
	Meningococcus	
	Corynebacterium	
	Bacillus	
	Clostridium (I)	
	Clostridium (II)	
	Non sporing anaerobes	
	E.Coli, Klebsiella, Proteus	
	Salmonella	
	Shigella	
	Vibrio	

	Pseudomonas	
	Pasteurella, Haemophilus	
	Bordetella and Brucella	
	Mycobacterium tuberculosis	
	Atypical mycobacteria	
es	M. leprae	
ab.	Spirochaetes . T. pallidum	
tes.	Spirochaetes (II)	
	Rickettsiae	
	Actinomycetes and Nocardia	
	Mycoplasma	
	Chlamydiae	
	Miscellaneous Bacteria	

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M.SC V<sup>TH</sup> SEMESTER-SYLLABUS

(DETAILS OF MYCOLOGY, VIROLOGY AND PARASITOLOGY)

DETAILS OF MYCOLOGY

Format-

Fungus species, habitat, mode of action, pathogenesis, clinical features,  
Lab. Diagnosis - Specimen collection & transport, physical & microscopic examination,  
culture characteristics, Species identification.

Sr. No.	Topic	
	<u>DETAILS OF MYCOLOGY.</u>	
	Historical aspects, Incidence of fungal infections, predisposing factors. Differences from bacterial cell. Structure of fungus . Morphological classification- Yeasts, Yeast like fungi, Moulds, Diamorphic fungi. Systemic classification of fungi.	
	<u>Classification of fungal diseases.</u> List the fungi causing skin infections, subcutaneous mycoses, systemic mycoses, Opportunistic fungal infections.	
	<u>Outline of lab diagnosis of fungal infections</u>	
	<u>Fungi causing superficial infection.</u> Clinical features. Laboratory diagnosis by Direct microscopy, Isolation and identification of common fungi	
	<u>Fungi causing subcutaneous mycoses</u> Clinical features. Laboratory diagnosis by Direct microscopy, Isolation and identification of common fungi	
	<u>Fungi causing systemic infection</u> Laboratory diagnosis by direct microscopy, Isolation and identification. Of common fungi	
	<u>Fungi causing opportunistic infection.</u> Laboratory diagnosis by direct microscopy Isolation and identification.	



DETAILS OF VIROLOGYFormat of study

- 1) Classification of the group of viruses e.g. classification of Pox group of viruses and list the diseases caused.
- 2) Study of main pathogenic viruses in the group-  
Structure of virus –Genome , size, shape, envelope , symmetry. Source of infection, Route of infection , Localisation in target organ/tissue, lesion.  
Brief clinical features.

Laboratory diagnosis

Collection of specimen, preservation and transport. Direct examination for virus particle inclusion bodies, Special stains, Immunofluorescence, Electron Microscopy. Cultivation of virus. Examination of virus antigen in blood/ specimen. Examination of virus antibodies in blood/ specimen.

Sr. No.	Topic	
	<u>DETAILS OF VIROLOGY</u>	
	<u>General Properties of viruses -I</u> Historical aspect, Structure, composition, Resistance of viruses, Virus multiplication Inclusion bodies.	
	<u>General properties of viruses - II</u> Cultivation of viruses, viral assays Classification of viruses – DNA and RNA And list diseases caused by them.	
	<u>Outline of diagnosis of viral diseases</u> Virus host interactions.	
	Bacteriophage Pox viruses.	
	Herpes viruses Adeno viruses	
	Picorna viruses Orthomyxoviruses	
	Paramyxoviruses	
	Arboviruses Rhabdoviruses	
	Hepatitis viruses	
	Human immunodeficiency virus and AIDS	
	Oncogenic viruses	

DETAILS OF PARASITOLOGYFormat of study

Habitat, Geographical distribution, Morphology- all forms-Trophozoite / cysts, Adult worms Ova, cysts, Definitive and Intermediate host  
 Mode of Infection ( Route of entry), Final location, Life cycle; Lesions, Clinical features

Laboratory diagnosis-

Chart- Outline of tests, Specimen collection, Gross examination Morphology, Microscopic examination - Morphology, Serological tests, Skin tests, Other tests

Sr. No.	Topic	
	<u>DETAILS OF PARASITOLOGY</u>	
	Introduction, various terms, pathogenesis of lesions, classification of parasites, General characters and examples of parasitic species.	
	<u>PROTOZOA</u> - E. histolytica and other amoebae	
	Giardia, Trichomonas	
	Leishmania donovani and Trypanosomes	
	Malarial Parasites, Babesia	
	Toxoplasma gondii, Sarcocystis	
	Isospora, Cyclospora, Cryptosporidium	
	Pneumocystis carinii	
	<u>Helminthology-</u> Introduction, General characters, classification	
	<u>Nematodes</u> - General characters, Classification	
	Ascaris lumbricoides (Round worms)	
	Hookworms, S. stercoralis	
	Trichuris trichiura, E. vermicularis	

Filarial worms & D. medinensis	
<u>Cestodes</u> – General characters, Classification.	
Taenia saginata , T. solium H. Nana, D. latum.	
E. granulosus	
<u>Trematodes</u> – General character, Classification.	
Schistosomes ,	
F. hepatica, F. buski, C. sinensis , P. westermanii	
System wise Parasitic Infections.	
Parasitic Diseases In Aids	
Diagnostic Procedures Concentration Techniques.	

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M.SC VI<sup>TH</sup> SEMESTER-SYLLABUS

Sr. No.	Activity	
1	Submission of Dissertation	
2	Elective / Industrial Postings	

Curriculum

	Theory Examination (60 Marks)	Marks
1.	Total Quality Management including Quality Assurance & Quality control	15
b.	Accreditation of Medical laboratory	15
c.	Laboratory Safety	15
d.	Bacteriological examination of air, food, water & Milk	15
	<b>Practical Examination (40 Marks)</b>	
a.	Presentation and discussion on dissertation	25
b.	Viva Voce on above mentioned topics	15

## 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
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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 Practicals (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

Marks

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

Internal  
ive  
am section)

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:

10 marks.

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

10 marks.

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. 4.13 of BOM-55/2018: Resolved as follows:-**

- (i) Slow learners must be re-designated as potential learners.
- (ii) Students scoring less than 35% marks in a particular subjects/course in the 1<sup>st</sup> formative exam are to be listed as potential learners. These learners must be constantly encouraged to perform better with the help of various remedial measures.
- (iii) Students scoring more than 75% marks in a particular subjects/course in the 1<sup>st</sup> formative exam are to be listed as advanced learners. These learners must be constantly encouraged to participate in various scholarly activities.

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

To: drravindrai@gmail.com, inamdar123456@gmail.com, ipseetamohanty@yahoo.co.in, jaishreeghanekar@gmail.com, drspravin22@gmail.com, dr\_spravin@hotmail.com, sudhirkul1979@gmail.com, mansibiotech79@gmail.com, sbsnm@mgmuhs.com, rajani.kanade@gmail.com, mgmschoolofphysiotherapy@gmail.com, prabhadasila@gmail.com, mgmnewbombaycollegeofnursing@gmail.com, gashroff2006@gmail.com, rupalgshroff@yahoo.com, manjushreeb@yahoo.com, drshobhasalve@gmail.com, spdubhashi@gmail.com, javantkarbhase@gmail.com, veenashatolkar@gmail.com, sharathcrisp@gmail.com, mgmipth@themgmgroup.com, anuradhamhaske@hotmail.com, principalconabad@gmail.com  
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,

Plot No. 1 &amp; 2, Sector -1, Kamothe,

Navi Mumbai - 410 209

Tel.: 022 - 27432471 / 27432994

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Website: www.mgmuhs.com

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

Sector 1, Kamothe Navi Mumbai-410209, Tel.No.:022-27437631,27432890

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.

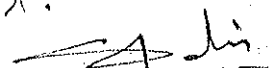
This subject is well recognized as an essential tool in medical research, clinical decision making, and health management. It is recommended to streamline the syllabus and make **Research Methodology and Biostatistics' compulsory in all the post graduate courses of School Biomedical Sciences.** The modified 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*  
*2/7*

**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.

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Sdp-Pimple/joshi-obgy