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MGM INSTITUTE OF HEALTH SCIENCES

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

CHOICE BASED CREDIT SYSTEM

(CBCS)

(with effect from 2019-2020 Batches)

Curriculum for

M.Sc. Medical Microbiology

Amended upto AC-42/2022, dated 26/04/2022

Amended History

1. Approved as per Resolution No. 3.2.1.6.i, of BOM – 57/2019, dated 26/04/2019.
2. Amended as per Resolution No. 3.1.2.4 of BOM – 59/2019, dated 11/11/2019.
3. Amended as per Resolution No. 3.2.2.4 of BOM-62/2020, dated 16/09/2020.
4. Amended as per Resolution No. 3.29, Resolution No. 2, Resolution No. 10.4.i of AC-42/2022, dated 26/04/2022. (Incorporated at the end of syllabus).

Name of the Degree: M.Sc. Medical Microbiology

AIMS OF THE PROGRAM

Microbiologist are in great demand of India and abroad.

Postgraduate qualification in Microbiology can earn to placements in hospital laboratories and research laboratories run by the government and the corporate sector. Private sector placements are in both technical and managerial positions. The demand is growing at an accelerated rate, which makes career prospects in this field bright.

In academics, one can go for higher qualifications like Ph.D. in various field of biology. There is a great demand of this course abroad as most of the foreign countries are looking for expert in this field. After completion of the course, one can work as Tutor or Medical Microbiologist in a Medical set up or as a Research Associate in Research Laboratories.

Duration of Study: The duration of the study for M.Sc. Medical Microbiology will be of six semesters spread over three years.

Program pattern- Commencement of Semester

- First Semester: August
- Second Semester: February
- Third Semester: August
- Fourth Semester: February
- Fifth Semester: August
- Sixth Semester: February

Eligibility Criteria: As a minimum criterion of eligibility, aspiring candidates are needed to have attained a B.Sc. in any discipline of Life Sciences, Biosciences, Bachelor's degree in any of Physics, Biological Sciences, M.B.B.S, BDS, BAMS, BHMS, B.Pharm.,B.Tech (Biotechnology), Bachelor's Degree in Agricultural, Veterinary and Fishery Sciences, or equivalent examination with a minimum aggregate score of 50%.

For any query visit the website: www.mgmuhs.com

CURRICULUM FOR M. Sc. Medical Microbiology

I st YEAR

Semester I							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MM101T	**Medical Anatomy**	**4**	**4**	**20**	**60**	**80**
	MM102T	**Medical Physiology**	**4**	**4**	**20**	**60**	**80**
	MM103T	**Medical Biochemistry**	**4**	**4**	**20**	**60**	**80**
	MM104T	**Medical Pharmacology**	**4**	**4**	**20**	**60**	**80**
	MM105T	**Medical Microbiology**	**4**	**4**	**20**	**60**	**80**
	Practical						
	MM101P	**Medical Anatomy**	**1**	**2**	**20**	**50**	**70**
	MM102P	**Medical Physiology**	**1**	**2**	**20**	**50**	**70**
	MM103P	**Medical Biochemistry**	**1**	**2**	**20**	**50**	**70**
	MM104P	**Medical Pharmacology**	**1**	**2**	**20**	**50**	**70**
	MM105P	**Medical Microbiology**	**1**	**2**	**20**	**50**	**70**
	Total		**25**	**30**	**200**	**550**	**750**

Semester II

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MM201T	**Medical Anatomy**	**4**	**4**	**20**	**60**	**80**
	MM202T	**Medical Physiology**	**4**	**4**	**20**	**60**	**80**
	MM203T	**Medical Biochemistry**	**4**	**4**	**20**	**60**	**80**
	MM204T	**Medical Pharmacology**	**4**	**4**	**20**	**60**	**80**
	MM205T	**Medical Microbiology**	**4**	**4**	**20**	**60**	**80**
	MM206T	**Research Methodology & Biostatistics (Core Course)**	**4**	**4**	**20**	**60**	**80**
	Practical						
	MM201P	**Medical Anatomy**	**1**	**2**	**20**	**50**	**70**
	MM202P	**Medical Physiology**	**1**	**2**	**20**	**50**	**70**
	MM203P	**Medical Biochemistry**	**1**	**2**	**20**	**50**	**70**
	MM204P	**Medical Pharmacology**	**1**	**2**	**20**	**50**	**70**
	MM205P	**Medical Microbiology**	**1**	**2**	**20**	**50**	**70**
	MM206P	**Research Methodology & Biostatistics (Core Course)**	**1**	**2**	**20**	**50**	**70**
	Total		**30**	**36**	**240**	**660**	**900**

2ND YEAR

Semester III							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MM301T	Details of General Microbiology Details of Immunology	4	4	20	100	120
		Core Elective course* **	4	4	Internal Exam 80 Marks*		
	MM302CET	Molecular Biology					
	MM303CET	Nanobiotechnology					
	MM304CET	Health Care Associated Infections					
	MM305	Clinical Postings	6	18		20 *	20
	MM306	Dissertation/Project Proposal**	5	10		20*	20
	MM307	Seminar	2	2		20*	20
	Practical						
	MM301P	Details of General Microbiology Details of Immunology	2	4	20	100	120
		Core Elective practical***	1	2	Internal Exam 50 Marks*		
	MM302CEP	Molecular Biology					
	MM303CEP	Nanobiotechnology					
	MM304CEP	Health Care Associated Infections					
		Total	24	44	40	260	300

***Exams to be conducted at Departmental Level**

Semester IV							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MM401T	**Systemic Bacteriology**	4	4	20	100	120
		General elective ***	4	4			
	MM402GET	Bioethics, Biosafety, IPR & Technology Transfer	Internal Exam of 80 Marks*****				
	MM403GET	Disaster Management and Mitigation Resources					
	MM404GET	Human rights					
	MM405	Clinical Postings	7	21		20*	20
	MM406	Dissertation / Project******	5	10		20*	20
	MM407	Seminar	2	2		20*	20
	Practical						
	MM401P	Systemic Bacteriology	2	4	20	100	120
		Total	24	45	40	260	300

***Exams to be conducted at Departmental Level**

IIIrd YEAR

Semester V							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MM501T	Virology, Parasitology, Mycology	4	4	20	100	120
	MM502	Clinical Postings	6	18		20*****	20
	MM503	Dissertation / Project**	10	20		20*	20
	MM504	Seminar/Journal Club	2	2		20*	20
	Practical						
	MM501P	Virology, Parasitology, Mycology	1	2	20	100	120
		Total	23	46	40	260	300

***Exams to be conducted at Departmental Level**

Semester VI							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MM601T	Applied Microbiology & Molecular Biology	4	4	20	100	120
	MM602	Clinical Postings	5	15		20*	20
	MM603	Seminar/Journal Club	1	1		20*	20
	Practical						
	MM601P	Applied Microbiology & Molecular Biology	2	4	20	50	70
	MM602P	Dissertation / Project**	12	24		70	70
		Total	24	48	40	260	300

*** Exams to be taken at Departmental Level**

******(a) **Dissertation / Project Course** commences in II nd Semester.

Students should undergo ICMR Online Course of Research Methodology before submitting the protocol for their Dissertation. (Ist / II nd Semester)

Allotment of Guide	II nd Semester (On or Before 30 April)
Submission of Protocol for Scientific and Ethical Committee Approval	III rd Semester (On or Before 14 th Aug)
Scientific and Ethical Approval	III rd Semester (On or Before 14 th October)
Commencement of Research Work	III rd Semester 15th October
Submission of Thesis	VI th Semester 31 st March

***** (Elective): Any one subject is to be chosen from the subjects offered** (Subjects offered may change from time to time depending on the availability of expertise)

Elective courses may or may not have practical and/or field work.

ACADEMIC SYLLABUS FOR SEMESTER-I (ANNEXURE 1)

Name of the Programme	**M.Sc. MEDICAL MICROBIOLOGY**
Name of the Course	**MICROBIOLOGY Part 1**

Course Objective (Teaching Objectives)	• To teach basic Microbiological concepts related to General Microbiology • To teach basic Microbiological concepts related to Immunology
Course Outcomes (learning Objectives)	• To understand the basic Microbiological concepts of General physiology • To understand the basic Microbiological concepts of Immunology,

Unit no.	THEORY TOPICS	Hours allotted 45hrs
1.	**General Microbiology**	**(35 hrs)**
	Historical aspects	**1**
	Classification of living beings	**1**
	Study of bacteria	**2**
	Structure of Bacterial cell	**2**
	Growth and Multiplication of Bacteria	**2**
	Sterilization	**3**
	Disinfection	**3**
	Culture Media	**2**
	Culture Methods	**2**
	Identification of Bacteria	**2**
	Bacterial Genetics	**2**
	Antimicrobial Agents	**1**
	Antibiotic Sensitivity Test	**2**
	Antibiotic Resistance	**2**
	Universal Safety Precautions	**2**
	Hospital Waste Disposal	**2**
	Hospital Acquired Infections	**2**
	Infection Control Committee	**2**
2.	**Immunology**	**10 Hrs**
	Infection	**1 Hr**
	Immunity	**2 Hr**
	Antigens	**1 Hr**
	Antibodies	**1 Hr**
	Complement	**1 Hr**
	Serological Reactions	**4 Hr**
	Total	**45 HRS**

Unit no.	TUTORIAL TOPICS	Hours allotted 15hrs
1.	Historical aspects & Microscopy	1
2.	Study of bacteria	1
3.	Sterilization	1
4.	Disinfection	1
5.	Culture Media & Culture Methods	1
6.	Identification of Bacteria	1
7.	Bacterial Genetics	1
8.	Antibiotic Sensitivity Test & Antibiotic Resistance	1
9.	Universal Safety Precautions & Hospital Waste Disposal	1
10.	Hospital Acquired Infections & Infection Control Committee	1
11.	Infection & Immunity	1
12.	Antigens & Antibodies	1
13.	Complement	1
14.	Serological Reactions	1
15.	Vaccines and Immunization Schedule	1
	Total	**15hrs**

Unit no.	PRACTICAL TOPICS	Hours allotted 30 hrs
1.	**General Microbiology**	**18 hrs**
	1. Microscopy	**2 Hr**
	2. Study of Bacteria (Gram's Stain)	**4 Hr**
	3. Study of Bacteria (ZN Stain)	**4 Hr**
	4. Culture Media	**2 Hr**
	5. Identification of Bacteria	**2 Hr**
	6. Sterilization	**2 Hr**
	7. Disinfection	**2 Hr**
2.	**Immunology**	**12 Hrs**
	1. Widal Test & VDRL Test	**2 Hr**
	2. ASO, CRP, RA Test	**2 Hr**
	3. ELISA Test	**2 Hr**
	4. Test for HIV & Hepatitis	**2 Hr**
	5. Test for Dengue	**2 Hr**
	6. Vaccines & Immunization Schedule	**2 Hr**
	Total	**30 HRS**

REFERENCE BOOKS:

List of the books recommended
MSc- Medical Microbiology

Semester	Name of the Books	Author/ Editor
I	Textbook of Microbiology	Ananthnarayan & Paniker
	Textbook of Microbiology	C.P. Baveja
	Practical & Applied Microbiology	Anuradha De

ACADEMIC SYLLABUS FOR SEMESTER-II

Name of the Programme	**M.Sc. MEDICAL MICROBIOLOGY**
Name of the Course	**MICROBIOLOGY Part 2**

Course Objective (Teaching Objectives)		• To teach basic Microbiological concepts related to Systemic Bacteriology • To teach basic Microbiological concepts related to Mycology • To teach basic Microbiological concepts related to Virology • To teach basic Microbiological concepts related to Parasitology • To teach basic concepts related to Applied Microbiology
Course Outcomes (Learning Objectives)		• To understand the basic Microbiological concepts of Systemic Bacteriology • To understand the basic Microbiological concepts of Mycology • To understand the basic Microbiological concepts related to Virology • To understand the basic Microbiological concepts related to Parasitology • To understand the basic concepts related to Applied Microbiology

Unit no.	THEORY TOPICS	No of lectures	
3.	**Basics of Systemic Bacteriology** • Gram Positive Organisms: Morphology and infections caused by Staphylococcus, Streptococcus, Pneumococcus, Bacillus • Corynebacterium diphtheria (Morphology, Pathogenesis, Lab Diagnosis) • Anaerobes: Morphology and infections caused by allClostridia Pathogenesis and Lab Diagnosis of gsgangreen • Mycobacteria Morphology and infections caused by M. leprae, Atypical mycobacteria • Mycobacterium tuberculosis (Morphology, Pathogenesis, Lab Diagnosis) • Gram Negative Organisms: Morphology and infections caused by Gonococcus, Meningococcus • E.Coli, Klebsiella, Proteus, Shigella- Morphology and infections caused • Salmonella -Morphology, Pathogenesis, Lab Diagnosis of enteric fever • Morphology and infections caused by Pseudomonas, yersinia, Haemophilus, Bordetella and Brucella • Vibrio (Morphology, Pathogenesis, Lab Diagnosis) • Spirochetes: Morphology and infections caused by Spirochaetes, Leptospira T. pallidum (Morphology, Pathogenesis, Lab Diagnosis), • Miscellaneous: Morphology and infections caused by Rickettsiae ,Chlamydiae, Actinomycetes and Nocardia, Mycoplasma, Miscellaneous Bacteria	1 1 1 1 1 1 1 1 1 1 1 1 1 1	**12 hrs**
4.	**Basics of Mycology** • Introduction, General features, Structure, Differences from bacteria , Classification – Morphological	1 1 1	**5 Hrs**

	• Broad outline of Lab diagnosis along with Specimen Collection • Superficial, sub cutaneous Lab diagnosis of dermatophytes • Deep infections -fungi names and diseases caused, morphology of cryptococcus • Opportunistic fungi diseases caused, morphology of candida and aspergillus - 1lecture	1 1	
5.	**Basics of Virology** • Historical aspects: General properties of viruses, Structure, Composition, Multiplication, Resistance • Cultivation of viruses • Classification of viruses: DNA Virus– Name the diseases caused. • RNA Virus – Name the diseases caused • Specimen collection and transport • Outline of diagnosis of viral diseases • Details of HIV: Structure of virus, modes of transmission, Pathogenicity, clinical features, • HIV Laboratory diagnosis. PEP • Details Hepatitis B virus: Structure of virus, modes of transmission, Pathogenicity, clinical features, • HBV Laboratory diagnosis. PEP • HAV, HCV, HEV: tramsmission, Pathogenicity, • Swine flu, Ebola Virus, Rabies: Dengue ,Rota virus Tramsmission Pathogenicity,	1 1 1 1 1 1 1 1 1 1 1 1	**12 Hrs**
6.	**Basics of Parasitology** • Definition and explanation of various terms - Parasite, host, symbiosis, commensalism, Parasitism, Parasitology, • Classes of parasites, Classes of hosts, Outline of laboratory diagnosis of parasitic diseases, • **General features of Protozoa**- List of Common Protozoa	1 1 1 1 1 1 1 1	**10 Hrs**

	& diseases caused E. Histolytica- Morphology, Life cycle, Pathogenicity and Lab. Diagnosis Plasmodium spp.- Morphology, Life cycle, Pathogenicity and Lab. Diagnosis • **General features of Helminths** – Classification • **General features of Nematodes**- Examples of nematodes - List the diseases caused, Ascaris lumbricoides - Morphology – Adult worm, Ova. Lesions, Clinical features & Lab. Diagnosis. • **General features of Cestodes** - Examples of Parasites- List the diseases caused, T. saginata, T. solium- Morphology –Adult worms, Ova Def. & Int. Host, Lesions, Lab diagnosis • **General features of Trematodes** - Examples of Parasites and list the diseases caused • **Vectors**- Definition, types, diseases transmitted	1 1	
7.	**Applied Microbiology** • List of Organisms causing PUO • List of Organisms causing Diarrhea • List of Organisms causing LRTI • List of Organisms causing Meningitis • List of Organisms causing UTI • List of Organisms causing STD	1 1 1 1 1 1	**6Hrs**
	Total		**45 HRS**

Unit no.	TUTORIAL TOPICS	Hours allotted 15hrs
1	Gram positive Bacteria	1
2	Laboratory diagnosis of anaerobic bacterial infections	1
3	Laboratory diagnosis of M. Tuberculosis	1

4	Gram negative Bacteria	1
5	Laboratory diagnosis of T. pallidum	1
6	Laboratory diagnosis of Leptospirosis	1
7	Laboratory diagnosis of Fungal Infections	1
8	Laboratory diagnosis of Viral Infections	1
9	Human Immunodeficiency Virus structure and lab diagnosis	1
10	Hepatitis B virus structure and lab diagnosis	1
11	Laboratory diagnosis of Parasitic Infections	1
12	Laboratory diagnosis of Ascaris lumbricoides	1
13	Laboratory diagnosis of Tinea saginata& Tinea solium	1
14	Medical Entomology: Common vectors and diseases transmited	1
15	Applied Microbiology: organisms causing syndromes meningitis, UTI, diarrhoea, LRTI,PUO,STD	1
	Total	**15hrs**

Unit no.	**PRACTICAL TOPICS**	**Hours allotted 30 hrs**
3.	**Basics of Systemic Bacteriology** 8. Gram positive cocci (Staph, Strepto, Pneumo) Grams staining and slides 9. Gram positive bacilli (C. diphtheriae, Clostridium species) 10. Mycobacterium species slides and ZN staining 11. Gram negative bacteria (Niesseriae species), Vibrio & Pseudomonas species 12. Enterobacteriaeceae(E. Coli, Klebsiella, Proteus, Salmonella, Shigella) 13. Spirochetes	**12 hrs**
4.	**Basics of Mycology** 7. General Introduction to Mycology	**04 Hrs**

	8. Laboratory diagnosis of fungal infections, grams staining for candida, Wet mount of common fungi like aspergillus, LPCB preparation	
5.	**Basics of Virology** 1. General Introduction to Virology 2. Laboratory diagnosis of Viral infections 3. Human Immunodeficiency Virus & Hepatitis B. Virus Demo of rapid tests for HIV and Hepatitis B. Virus	**06 Hrs**
6.	**Basics of Parasitology** 1. General Introduction to Parasitology, Stool Examination 2. Laboratory diagnosis of Plasmodium species (Protozoa) 3. Laboratory diagnosis of T. saginata& T. solium(Cestodes) 4. Laboratory diagnosis of A. lumbricoides & A. deodenale (Nematodes) Demo of slides and specimens	**08 Hrs**
	Total	**30 HRS**

REFERENCE BOOKS:

List of the books recommended
MSc- Medical Microbiology

Semester	Name of the Books	Author/ Editor
II	Textbook of Microbiology	Ananthnarayan&Paniker
	Textbook of Microbiology	C.P. Baveja
	Practical & Applied Microbiology	Anuradha De
	Medical Parasitology	C.P. Baveja V. Baveja

MGM INSTITUTE OF HEALTH SCIENCES M. Sc. Medical Students Syllabus for Research Methodology and Biostatistics		
	No. of Hours	
I. Research Methodology:	Theory	Practical
Scientific Methods of Research : 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	—
Research Designs: Prospective, retrospective, 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	—
Sampling Designs : 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.	4	0
Measurement in research: 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
Methods of Data Collection: Types of data, Collection of Primary Data, Observation Method, Interview Method, Collection of Primary Data	3	0
Ethics and Ethical practice in research and plagiarism	1	
Sampling Fundamentals : 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	2
II. Biostatistics		

Data Presentation : 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	3
Measures of Central Tendency and Dispersion : 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	3
Testing of Hypotheses: Definition, Basic Concepts, Procedure for Hypothesis Testing, Normal distribution, data transformationImportant 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, Testing the Equality of Variances of Two Normal Populations.	6	6
Chi-square Test: 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
Measures of Relationship: Need and meaning, Correlation and Simple Regression Analysis	2	2
Analysis of Variance and Covariance: 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
Nonparametric or Distribution-free Tests: 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	3
Vital Health Statistics: Measurement of Population: rate, crude rate, specific rate, *Measurement of fertility***:** specific fertility rate, Total fertility rate, *Reproduction rate,* 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	3
Computer Application Use of Computer in data analysis and research, Use of Software and Statistical package.	0	2
Total hours	55	35

ASSESSMENT

1. LETTER GRADES AND GRADE POINTS:

MGMIHS has adopted the UGC recommended system of awarding grades and CGPA under Choice Based Credit Semester System for MSc Medical courses.

1. MGMIHS would be following the absolute grading system, where the marks are compounded to grades based on pre-determined class intervals.
2. The UGC recommended 10-point grading system with the following letter grades will be followed:

Table 1: Grades and Grade Points

Letter Grade	Grade Point
O (Outstanding)	10
A+ (Excellent)	9
A (Very Good)	8
B (Good)	7
C (Above Average)	6
F (Fail)/ RA (Reappear)	0
Ab (Absent)	0
Not Completed (NC)	0
RC (<50% in attendance or in Internal Assessment)	

a. A student obtaining Grade RA shall be considered failed and will be required to reappear in the examination.

b. Candidates with NC grading are those detained in a course (s); while RC indicate student not fulfilling the minimum criteria for academic progress or less than 50%in attendance or less than 50% in internal assessments (IA). Registrations of such students for the respective courses shall be treated as cancelled. If the course is a core course, the candidate has to re-register and repeat the course when it is offered next time.

c. CBCS Grading System - Marks Equivalence Table

Table 2: Grades and Grade Points

Letter Grade	Grade Point	% of Marks
O (Outstanding)	10	86-100
A+ (Excellent)	9	70-85
A (Very Good)	8	60 -69
B (Good)	7	55 -59
C (Above Average) – **Pass both for UG and PGs**	6	50- 54
F (Fail))/ RA (Reappear)	0	Less than 50
Ab (Absent)	0	-
NC- not completed	0	-
RC- Repeat the Course	0	0

Table 3: Cumulative Grades and Grade Points

Letter Grade	Grade Point	CGPA
O (Outstanding)	10	9.01 - 10.00
A+ (Excellent)	9	8.01 – 9.00
A (Very Good)	8	7.01 – 8.00
B (Good)	7	6.00 - 7.00
C (Above Average)	6	5.01 - 6.00

d. Assessment of a Course: Evaluation for a course shall be done on a continuous basis. Uniform procedure will be adopted under the CBCS to conduct continuous internal assessments (IA), followed by one end-semester university examination (ES) for each course.

e. Courses in programs wherein Theory and Lab are assessed jointly, the minimum passing head has to be 50% Grade each for theory and practical's separately. RA grade in any one of the components will amount to reappearing in both components. i.e. theory and practical.

2. Eligibility to appear for the end-semester examinations for a course includes:

Candidates having ≥ 75% attendance and obtaining the minimum 35% in internal assessments in each course to qualify for appearing in the end-semester university examinations.

The students desirous of appearing for university examination shall submit the application form duly filled along with the prescribed examination fee.

Incomplete application forms or application forms submitted without prescribed fee or application form submitted after due date will be rejected and student shall not be allowed to appear for examination.

3. Passing Heads

The minimum passing head shall be 50% in both Theory and practicals separately including the internal assessment.
Elective subjects – the minimum prescribed marks for a pass in elective subject should be 50%. The marks obtained in an elective subjects should be communicated to the university before the commencement of the university examination.(FromIIIrdSem Onwards)

4 Detention:

A student not meeting any of the above criteria may be detained (NC) in that particular course for the semester. In the subsequent semester, such a candidate improve in all, including attendance and/or IA minimum to become eligible for the next end-semester examination.

5 The maximum duration for completing the course will be 6 years (minimum duration of course x 2) i.e. (3x2) =6 years for PG Courses, failing which his/her registration will be cancelled. Full fees of entire course of three years may be liable to be paid by the students.

6 Carry over benefit:

A candidate who fails in any two main subjects of previous semester shall be permitted to carry over those subjects to the next semester.

A candidate shall not be allowed to appear in the final semester examination unless the candidatehas cleared all the previous semester examinations.

7 Grace Marks for PG Courses:

No grace marks will be awarded for PG Exams.

8. University End-Semester Examination

There will be one final university examination at the end of every semester.

A candidate must have minimum 75% attendance (Irrespective of the type of absence) in theory and practical in each subject to be eligible for appearing the University examination.

The Dean shall send to the university a certificate of completion of required attendance and other requirements of the applicant as prescribed by the university, two weeks before the date of commencement of the written examination.

A candidate shall be eligible to sit for the examination only, if she / he has secured minimum 35% in internal assessment of that subject. The internal examinations will be conducted at college/ department level.

Notwithstanding – anything in any examination, a deficiency of attendance at lectures or practical maximum to the extent of 10% - may be condoned by the Dean.

If a candidate fails either in theory or in practical, he/ she have to re-appear for both.

There shall be no provision of re- evaluation of answer sheets. Candidates may apply

to the university following due procedure for recounting of theory marks in the

Presence of the subject experts.

Internal assessments shall be submitted by the Head of the Department to the university

through the Dean MGMMC at least two weeks before commencement of University theory examination.

Supplementary examination: There shall be no supplementary examination

Re-Verification -There shall be provision of retotaling of the answer sheets, candidateshall be permitted to apply for recounting/retotaling of theory papers within 8 days from the date of declaration of results.

Scheme of University Exam Theory PG Program: General structure / patterns for settingup question papers for Theory / Practical courses, their evaluation weightages for PG programs are given in the following tables.

Theory Question Paper Pattern for Core Subjects in University Examinations (for 1st &2nd Semester)

Under CBCS - 60Marks

Question Type	**No. of Questions**	**Questions to be Answered**	**Questions X Marks**	**Total Marks**
Brief Answer Questions	7	6	1X 10	60

General Instructions (Theory):

A. Time duration of each Theory Paper will be of Three (3) Hrs .
B. Total Marks of each Theory Paper will be 60 Marks

8. 13 Practical Question Paper Pattern For University Examinations Under CBCS - 50 Marks

Exercise	Description	Marks
Q No 1	Practical exercise – 1	1 x15=15 M
Q No 2	Station exercise	5x5M=25 M
Q No 3	VIVA	10 M
		Total = 50 M

General Instructions (Practical):

A. All the students have to remain present at the examination center 15 minutes before the scheduled time for examination.

B. Students have to carry with them certified journal, I-card or examination receipt, and other necessary requirements for examination.

C. Candidate should not leave the practical hall without the permission of examiner.

D. Use of calculator is allowed but the use of mobile phones is strictly prohibited.

E. The candidate has to leave the laboratory only after the submission of all the answer sheets of the exercises performed.

Internal examination pattern (Theory) : 30marks

Question type	No. of questions	Questions to be answered	Question X marks	Total marks
Brief Answer Questions	4	3	1X10	30

Breakup of theory IA calculation for 20 marks

Internal exam (Department -30 Marks)	15 marks
Seminar	5 marks
	Total = 20 M

Internal Examination Pattern (Practical): 30 Marks

Practical Exercise	10marks
Station Exercise	10 marks
Viva	10 marks
Total practical	30 Marks

Breakup of practical IA calculation:

Internal exam (Department -30 Marks)	15 marks
Journal	5 marks
	Total = 20 M

Internal Assessment marks should be submitted to the university by respective departments at least 15 days prior to onset of university examination.

9. Submission of Protocol of Dissertation: Students should undergo Online Course of Research Methodology (MCI- PG) before submitting the protocol for their Dissertation.

ACADEMIC SYLLABUS FOR SEMESTER-III

Name of the Programme	**M.Sc. MEDICAL MICROBIOLOGY**
Name of the Course	**MICROBIOLOGY Part 3**

Course Objective (Teaching Objectives)	• To teach detail Microbiological concepts related to General Microbiology • To teach detail Microbiological concepts related to Immunology
Course Outcomes (Learning Objectives)	• To understand detail Microbiological concepts of General Microbiology • To understand detail Microbiological concepts of Immunology

***Resolution No. 3.29 of Academic Council (AC-42/2022): Resolved to include 02 Immunology sub topics in M.Sc. 3rd semester (Medical Microbiology): [ANNEXURE-23]**
1) Immune response to be included under the topic "Structure and function of immune system".
2) Immuno deficiency diseases to be included under the topic "Autoimmunity".

Academic Syllabus for Core Subject

Unit no.	THEORY TOPICS	No of lectures	Total Hrs 60
1	**General Microbiology**		
	Historical aspects, Classification of living beings, Microscopy	4	
	Study of bacteria, Structure and composition of bacterial cell, Growth and multiplication of bacteria	5	
	Sterilization & Disinfection	4	
	Culture media & Culture methods, Biochemical reactions	4	**32 hrs**
	Antibiotic sensitivity test, Antimicrobial Agents & Antibiotic resistance	5	
	Universal safety precautions & Hospital waste management	2	
	Hospital acquired infections. Infection control committee	4	
	Bacterial genetics –I & II	4	
2	**Details of Immunology & Serology**		
	Infection, Immunity, Vaccines and immunization schedule	5	
	Antigen, Antibodies, Complement	5	
	Serological reactions –I & II	4	
	Structure and functions of immune system & Immune Response	4	**28 Hrs**
	Hypersensitivity	4	
	Autoimmunity & Immuno deficiency diseases	2	
	Transplantation immunity	2	
	Tumour immunity	2	

Unit no.	PRACTICAL TOPICS	Hours allotted 60 Hrs
7.	**General Microbiology (40 Hrs)** 14. Microscopy Light Microscope, Dark Ground Microscope, Phase Contrast Microscope, Fluorescent Microscope, Electron Microscope	**4 Hrs**
	8. Collection and Transport of Specimens	**4 Hrs**
	9. Study of Bacteria (Various Staining Methods) Gram Stain, ZN Stain, Albert Stain, Negative stain, Other Special Stain	**4 Hrs**
	10. Culture Media Identification of all Culture Media, Preparation of all Culture Media, Media pouring	**4 Hrs**
	11. Aerobic Culture Methods	**4 Hrs**
	12. Anaerobic Culture Methods	**4 Hrs**
	13. Identification of Bacteria Identification of various Biochemical tests, Interpretation of various Biochemical tests	**4 Hrs**
	14. Antimicrobial Susceptibility Testing	**4 Hrs**
	15. Sterilization – Physical Agents, Working of various instruments, Sterilization controls	**4 Hrs**
	16. Disinfection – Chemical Agents, OT Sterilization, Testing of disinfectants	**4 Hrs**
2	**Immunology (20 Hrs)**	
	1. Precipitation Reaction	**2 Hrs**
	2. Agglutination Reaction	**2 Hrs**

	3. Widal Test	**2 Hrs**
	4. VDRL Test	**2 Hrs**
	5. ASO Test, RA Test, CRP Test	**2 Hrs**
	6. ELISA Test	**2 Hrs**
	7. Radioimmunoassay	**2 Hrs**
	8. Immunochromatography tests	**2 Hrs**
	9. CBNAAT	**2 Hrs**
	10. Vaccines & Immunization Schedule	**2 Hrs**

Academic Syllabus for Core Elective Subject -1

Name of the Programme	**M. SC MEDICAL MICROBIOLOGY**
Name of the Course	**MOLECULAR BIOLOGY AND GENOMICS**

Course objective	1. Nucleic acid structure and interactions, signaling proteins and membrane proteins, enzyme kinetics and drug discovery and protein design. 2. It includes all steps in eukaryotic gene expression from chromatin accessibility to translation and mRNA turnover. Including the dynamics of proteins and membrane-bound organelles in eukaryotic cells. 3. Including cell and molecular biology of signaling and cancer, DNA repair and apoptosis. 4. Protein synthesis mechanisms, especially with respect to ribosome structure-function and accuracy of translation, considered mainly in prokaryotes. 5. Nucleosome positioning in relation to promoter architecture; promoter remodelling. The roles of histone acetylation, and the targeted acetylases (and deacetylases), and the action of ATP-dependent 'chromatin remodelling machines'.

Course outcomes	At end of the course accomplishment the students will marvel in 1. Molecular biology is the basic science that has as its goal an explanation of life processes at the sub cellular and molecular level. 2. The organization of the genome, the replication, the formation of RNA (transcription), the processing of pre mRNA and the protein synthesis (translation). 3. Relate properties of cancerous cells to mutational changes in gene function. 4. Account for regulation of cell form and movement; including cytoskeleton organization and generation of force and cell motility. 5. Describe and carry out basic molecular genetic methods; including work with bacteria, PCR amplification and analysis and electrophoresis of nucleic acid. 6. They will generate and test hypotheses, analyze data using statistical methods where appropriate, and appreciate the limitations of conclusions drawn from experimental data.

Unit no.	THEORY- Topics	Hours allotted 60hrs
1	**Structure of Nucleic Acid:** DNA, RNA, mRNA, tRNA, rRNA, Denaturation and Renaturation of DNA, Tm; GC content from Tm, Renaturation kinetics of DNA and complexity of DNA, Cot curves Satellite DNA: Repetitive DNA, SNP, STR,	**10 hrs**
2	**DNA Replication:** Prokaryotic and eukaryotic DNA replication, Mechanism of DNA replication, Enzymes and accessory proteins involved in DNA replication. DNA Damage & Repair.	**8 hrs**
3	**DNA Recombination** Models of homologous recombination - Homologous recombination protein machinery - Homologous recombination in eukaryotes	**8 hrs**
4	**Transcription** Prokaryotic transcription, Eukaryotic transcription, RNA polymerases, General and specific transcription factors, Regulatory elements and mechanisms of transcription regulation, 5'-Cap formation, Transcription termination, 3'-end processing and polyadenylation, Post-transcriptional gene silencing	**10 hrs**
5	**RNA splicing** Nuclear splicing, splice some and small nuclear RNAs, group I and group II introns, *Cis*- and *Trans*-splicing reactions, tRNA splicing, alternate splicing.	**8 hrs**
6	**Translation** Prokaryotic and eukaryotic translation: Synthesis of aminoacyl tRNAsynthesases, Mechanism of initiation, elongation and termination, Regulation of translation, co-and post-translational modifications of proteins	**8 hrs**
7	**Regulation of gene expression** Induction and repression, operon theory, *lac* operon, *trp*operon, ara operon, attenuation, positive and negative control, catabolite repression, regulation of transcription by Camp and CRP	**8 hrs**

Reference Books:

1) Molecular Biology; David Freifelder, Narosa Publishing House,2nd edition (2004)

2) Microbial Genetics; David Freifelder, Narosa Publishing House, 2ndedition(2004)

3) Principles of Gene Manipulations; S. B. Primrose, R. M. Twyman, R. W. old, BlackwellScience,6th Edition (2003).

4) Gene VIII; Benjamin Lewin; Oxford Univ. Press, 8thedition (2004)

5) Advanced Molecular Biology; R. M. Twyman, 1st Edition, (2003)

6) Instant Notes on Molecular Biology; P.C. Turner, A. G. Mclennan, A. D. Bates &M. R. H. White, 2nd Edition (2002)

Name of the Programme	**M. SC MEDICAL MICROBIOLOGY**
0Name of the Course	**MOLECULAR BIOLOGY & GENOMICS (PRACTICAL)**

Sr No.	**Practical (30 Hrs.)**
1	DNA extraction from blood - Manual Method
2	Isolation of RNA
3	Purification and Concentration of the DNA/RNA- Spectrophotometer
4	Estimation of DNA by Chemical Means- Diphenyl amine method
5	Estimation of RNA by Chemical Means- Orcinol Method
6	**I**solation of nucleic acids from the given sample and determination of the DNA and RNA content.
7	PCR analysis of DNA fragments by agarose gel electrophoresis

Academic Syllabus for Core Elective Subject 2

Name of the Programme	**M. SC MEDICAL Microbiology**
Name of the Course	**NANOBIOTECHNOLOGY**

Course objective	The course will function on : 1. Relevant knowledge from the disciplines of physics and chemistry to give you a fundamental understanding of the integrated multidisciplinary nature of Nanotechnology. 2. Experiment and computatecharacterisation of nanomaterials.on current microtechnologies including the design and fabrication of microelectronic circuits, microsystems and optoelectronics for biological studies. 3. Molecular medicine is the study of molecular and cellular phenomena in biological systems that enhances our understanding of human diseases and facilitates discovery research in disease prevention, diagnosis and therapy. 4. The study will includenclude new implant technologies, regenerative engineering, new nanomedicines to combat cancer and drug resistance, targeted medicines for treatment with reduced side effects, diagnostic technologies using nanomaterials etc.
Course outcomes	At the successful completion of the course the student will: 1. Describe the basic science behind the properties of materials at the nanometer scale, and the principles behind advanced experimental and computational techniques for studying nonmaterials. 2. Communicate clearly, precisely and effectively using conventional scientific language and mathematical notation. 3. Systematically solve scientific problems related specifically to nanotechnological materials using conventional scientific and mathematical notation.

Unit no.	Topics	Hours allotted 60hrs
1	**Functional Principles of Nanobiotechnology**: From Biotechnology to Nanobiotechnology. What is Nanobiotechnology? Information-Driven Nanoassembly, Energetic, Top down and bottom up approach for building nanomaterials, Chemical Transformation Biomaterials, Machine-Phase Nanobiotechnology	**10 hrs**
2	**Chemical methods for synthesis of Nanomaterials:** colloids and colloids in solutions, colloids in vacuum, colloids in medium, synthesis of colloids, growth of nanoparticles, synthesis of metal nanoparticles, synthesis of semiconductor nanoparticles, langmuir-blodgett method, micro emulsions, sol-gel method	**15 hrs**
3	**Biological synthesis of Nanomaterials:** synthesis using microorganisms, synthesis using plant extracts, synthesis using proteins and DNA template	**15 hrs**
4.	**Characterization Methods:** Optical Microscopy – Scanning Electron Microscopy – Transmission Electron Microscopy - Atomic Force Microscopy – Scanning Tunneling Microscopy – Optical Absorption and Emission Spectroscopy – Thermo gravimetric Analysis – Differential Scanning Calorimetry – Thermo mechanical Analysis- X-Ray Diffraction.	**10 hrs**
5.	**Application of Bionanotechnology:** Biosensors as Precursors of Bioelectronics, Fictionalization of Sensing Substrates, Biochip, Nanosensors-Miniaturization of Biosensors, Nanomaterial Based Biosensors. Electron Transfer of Biomolecules, Nanoparticle-Biomaterial Hybrid Systems for Sensing and Electronic Devices, Effect of Biosensor in biological and physicochemical techniques	**10 hrs**

Reference Books:

1. Nanotechnology: An Introduction, By Jeremy Ramsden
2. Nanotechnology in Agriculture and Food Science, edited by Monique A. V. Axelos, Marcel Van de voorde
3. Nanotechnology: "Risk, Ethics and Law", edited by Geoffrey Hunt, Michael Mehta
4. Introduction to Nanotechnology, By Poole

Name of the Programme	**M. SC MEDICAL Microbiology**
Name of the Course	**NANOBIOTECHNOLOGY**

Sr No	**Practical (30 Hrs.)**
1	Verification of Lambert Beer's law and determination of concentration of unknown solution by UV-Vis spectrophotometer
2	Preparation of colloidal Silver (Ag) nanoparticles with trisodium citrate and their characterization by UV-Vis spectroscopy
3	Preparation of metal oxide nanoparticles by micro emulsion technique.
4	Surface plasmon absorbance of metal nanoparticles – UV-vis spectroscopy
5	Preparation of colloidal metallic nanoparticles with trisodium citrate by chemical method and their characterization by UV-Vis spectroscopy
6	Preparation of colloidal metallic nanoparticles with trisodium citrate by biological method and their characterization by UV-Vis spectroscopy

ACADEMIC SYLLABUS FOR SEMESTER-IV

Name of the Programme	**M.Sc. MEDICAL MICROBIOLOGY**
Course Code	
Name of the Course	**MICROBIOLOGY Part 4**

Course Objective (Teaching Objectives)	• To teach detail Microbiological concepts related to Systemic Bacteriology
Course Outcomes (Learning Objectives)	• To understand detail Microbiological concepts of Systemic Bacteriology

Academic Syllabus for Core Subject

Unit no.	THEORY TOPICS	No of lectures	Total Teaching Hours (60)
1	**Gram Positive Organisms**		**09 Hrs**
	• Staphylococcus	2	
	• Streptococcus, Enterococcus, Pneumococcus	4	
	• Corynebacterium, Bacillus	3	
2	**Anaerobes and Mycobacteria**		13 Hrs
	• Clostridium species	3	
	• Non sporing anaerobes	2	
	• Mycobacterium tuberculosis	4	
	• M. leprae, Atypical mycobacteria	4	
3	**Gram Negative Organisms**		21 Hrs
	• Gonococcus, Meningococcus	4	
	• E.Coli, Klebsiella, Proteus, Yersinia	4	
	• Salmonella, Shigella	4	

	• Vibrio, Aeromonas	2	
	• Pseudomonas, Pasteurella, Other Non-fermenters	4	
	• Haemophilus, Bordetella and Brucella	3	
4	**Spirochetes & Miscellaneous**		
	• Spirochaetes . T. pallidum, Leptospira	4	
	• Rickettsiae , Chlamydiae	3	
	• Actinomycetes and Nocardia	3	
	• Mycoplasma	2	17 Hrs
	• Miscellaneous Bacteria (Listeria, Erysipelothrix, Trophyrema)	2	
	• Miscellaneous Bacteria (Campylobacter, Helicobacter, Legionella)	2	
	• Miscellaneous Bacteria (Francisella, Agents causing Donovaniasis, Rat-bite fever, Bacterial vaginosis)	1	
	Total		**60 HRS**

Unit no.	**PRACTICAL TOPICS**	**No of Practicals**	**Total Teaching Hours**
1	**Gram Positive Organisms**		
	• Staphylococcus	1	**08 Hrs**
	• Streptococcus, Enterococcus, Pneumococcus	2	
	• Corynebacterium, Bacillus	1	
2	**Anaerobes and Mycobacteria**		
	• Clostridium species	3	**14 Hrs**
	• Non sporing anaerobes	1	
	• Mycobacterium tuberculosis	2	
	• M. leprae, Atypical mycobacteria	1	
3	**Gram Negative Organisms**		
	• Gonococcus, Meningococcus	2	
	• E.Coli, Klebsiella, Proteus, Yersinia	2	
	• Salmonella, Shigella	2	**24 Hrs**
	• Vibrio, Aeromonas	2	
	• Pseudomonas, Pasteurella, Other Non-fermenters	2	

	• Haemophilus, Bordetella and Brucella	2	
4	**Spirochetes & Miscellaneous**		**14 Hrs**
	• Spirochaetes . T. pallidum, Leptospira	1	
	• Rickettsiae , Chlamydiae	1	
	• Actinomycetes and Nocardia	1	
	• Mycoplasma	1	
	• Miscellaneous Bacteria Listeria, Erysipelothrix, Trophyrema	1	
	• Miscellaneous Bacteria (Campylobacter, Helicobacter, Legionella)	1	
	• Miscellaneous Bacteria (Francisella, Agents causing Donovaniasis, Rat-bite fever, Bacterial vaginosis)	1	
	Total		**60 HRS**

Academic Syllabus for General Elective Subject 1

Name of the Programme	**M. SC MEDICAL MICROBIOLOGY**
Name of the Course	**BIOETHICS, BIOSAFETY, IPR & TECHNOLOGY TRANSFER**

Course objective	The students will gain structural knowledge on: 1. To list the routes of exposure for a pathogen to a human being. 2. To demonstrate and assess the proper use of PPE, best practices,biological containment, and be prepared to safely conduct research 3. To identify the role of the Biosafety Professional inBiomedical Research Laboratories 4. To appreciate the importance of assertion in interpersonal communication and beintroduced to some key assertion strategies 5. To understand the interpersonal nature of giving feedback, receiving criticism and resolving conflicts. 6. To establish attentive listening as an assertion strategy
Course outcomes	Students will learn to: 1. Effectively manage the health and safety aspects of a biological laboratory. 2. Give reliable, professional and informed advice and information to colleagues and managers. 3. Help to ensure that their institution complies with relevant legislation, liaise effectively with enforcing authorities and be aware of the penalties for failing to comply. 4. Build a context of understanding through communication. 5. Mediate between other conflicting parties. 6. Exhibit de-escalatory behaviors in situations of conflict. 7. Demonstrate acknowledgment and validation of the feelings, opinions, andcontributions of others.

Unit No.	THEORY : Topics	Hours allotted 60hrs
1	**Ethics***:* Benefits of Ethics, ELSI of Bioscience, recombinant therapeutic products for human health care, genetic modifications and food consumption, release of genetically engineered organisms, applications of human genetic rDNA research, human embryonic stem cell research.	**15 hrs**
2	**Patenting:** Patent and Trademark, Bioscience products and processes, Intellectual property rights, Plant breeders rights, trademarks, industrial designs, copyright biotechnology in developing countries. Biosafety and its implementation, Quality *control in* Biotechnology	**15 hrs**
3	**Introduction to quality assurance, accreditation & SOP writing :**Concept of ISO standards and certification , National regulatory body for accreditation, Quality parameters, GMP & GLP, Standard operating procedures, Application of QA in field of genetics, Data management of clinical and testing laboratory	**15 hrs**
4	**Funding of biotech business** (Financing alternatives, funding, funding for Bioscience/ Medical Health Sector in India, Exit strategy, licensing strategies, valuation), support mechanisms for entrepreneurship (Bio-entrepreneurship efforts in India, difficulties in India experienced, organizations supporting growth, areas of scope, funding agencies in India, policy initiatives), Role of knowledge centers and R&D (knowledge centers like universities and research institutions, role of technology and up gradation)	**15 hrs**
	TOTAL	**60 hrs**

Reference:

1. www.pdfdrive.net
2. www.khanacademy.org
3. www.acadeicearths.org
4. www.edx.org
5. www.open2study.com
6. www.academicjournals.org

Academic Syllabus for General Elective Subject 2

Name of the Programme	**M. SC MEDICAL MICROBIOLOGY**
Name of the Course	**DISASTER MANAGEMENT AND MITIGATION RESOURCES**

Course objective	The course will uplift about: 1. Understand and appreciate the specific contributions of the Red Cross/Red Crescent movement to the practice and conceptual understanding of disaster management and humanitarian response and their significance in the current context. 2. Recognize issues, debates and challenges arising from the nexus between paradigm of development and disasters. 3. Critically evaluate disaster risk reduction and humanitarian response policy and practice from multiple perspectives. 4. Respond to disaster risk reduction initiatives and disasters in an effective, humane and sustainable manner.
Course outcomes	At the successful completion of course the student will gain: 1. Knowledge and understanding of the disaster phenomenon, its different contextual aspects, impacts and public health consequences. 2. Knowledge and understanding of the International Strategy for Disaster Reduction (UN-ISDR) and to increase skills and abilities for implementing the Disaster Risk Reduction (DRR) Strategy. 3. Ensure skills and abilities to analyze potential effects of disasters and of the strategies and methods to deliver public health response to avert these effects.

Unit no.	THEORY : Topics	Hours allotted 60hrs
1	**Introduction:** Definition of Disaster, hazard, global and Indian scenario, general perspective, importance of study in human life, Direct and indirect effects of disasters, long term effects of disasters. Introduction to global warming and climate change.	**08 hrs**
2	**Natural Disaster and Manmade disasters:**Natural Disaster: Meaning and nature of natural disaster, Flood, Flash flood, drought, cloud burst, Earthquake, Landslides, Avalanches, Volcanic eruptions, Mudflow, Cyclone, Storm, Storm Surge, climate change, global warming, sea level rise, ozone depletion Manmade Disasters: Chemical, Industrial, Nuclear and Fire Hazards. Role of growing population and subsequent industrialization, urbanization and changing lifestyle of human beings in frequent occurrences of manmade disasters.	**15 hrs**
3	**Disaster Management, Policy and Administration:**Disaster management: meaning, concept, importance, objective of disaster management policy, disaster risks in India, Paradigm shift in disaster management. Policy and administration: Importance and principles of disaster management policies, command and co-ordination of in disaster management, rescue operations-how to start with and how to proceed in due course of time, study of flowchart showing the entire process.	**12 hrs**
4	**Financing Relief Measures:**Ways to raise finance for relief expenditure, role of government agencies and NGO's in this process, Legal aspects related to finance raising as well as overall management of disasters. Various NGO's and the works they have carried out in the past on the occurrence of various disasters, Ways to approach these teams. International relief aid agencies and their role in extreme events.	**13 hrs**
5	**Preventive and Mitigation Measures:**Pre-disaster, during disaster and post-disaster measures in some events in general structural mapping: Risk mapping, assessment and analysis, sea walls and embankments, Bio shield, shelters, early warning and communication Non Structural Mitigation: Community based disaster preparedness, risk transfer and risk financing, capacity development and training, awareness and education, contingency plans. Do's and don'ts in case of disasters and effective implementation of relief aids.	**12 hrs**

Reference Books:

1. ShailendraK.Singh : Safety & Risk Management, Mittal Publishers
2. J.H.Diwan : Safety, Security & Risk Management,APH
3. Stephen Ayers &Garmvik: Text Book of Critical Care, Holbook and Shoemaker
4. www.pdfdrive.net
5. www.khanacademy.org
6. www.acadeicearths.org
7. www.edx.org
8. www.open2study.com
9. www.academicjournals.org

Academic Syllabus for General Elective Subject 3

Name of the Programme	**M. SC MEDICAL MICROBIOLOGY**
Name of the Course	**HUMAN RIGHTS**

Course objective	Students will comprehend on: 1. A branch of public international law, and relevant juridical mechanisms at global as well as regional levels. 2. Human rights as an object of study in history, philosophy and the social sciences, as well as a practical reality in national and international politics. 3. Different forms of promoting and implementing human rights, domestically as well as on the international level. 4. The role of human rights in contemporary issues relating to terrorism, religion, ethnicity, gender and development. 5. Cholarly values such as transparency, impartiality, clarity, reliance and the importance of sound reasoning and empirical inference.
Course outcomes	Student will be able to virtue: 1. identify, contextualise and use information about the human rights situation in a given country 2. critically appraise source material, including cases from human rights committees and tribunals and reports and summary records from treaty bodies 3. analyse a country's situation or an international situation in terms of human rights and formulate human rights-based initiatives and policies 4. Promote human rights through legal as well as non-legal means. 5. Participate in legal, political and other debates involving human rights in a knowledgeable and constructive way

Unit no.	THEORY : Topics	Hours allotted 60hrs
1	**Background:** Introduction, Meaning, Nature and Scope, Development of Human Rights, Theories of Rights, Types of Rights	**08 hrs**
2	**Human rights at various level :** Human Rights at Global Level UNO, Human Rights – UDHR 1948 – UN Conventions on Human Rights: International Covenant on civil and Political Rights 1966, International Convent on Economic, Social and Cultural Right, Racial Discrimination -1966 International, Instruments: U.N. Commission for Human Rights, European Convention on Human Rights.	**15 hrs**
3	**Human rights in India :** Development of Human Rights in India, Human Rights and the Constitution of India, Protection of Human Rights Act 1993- National Human Rights Commission, State Human Rights Commission, Composition Powers and Functions, National Commission for Minorities, SC/ST and Woman	**12 hrs**
4	**Human Rights Violations:** Human Rights Violations against Women, Human Rights Violations against Children, 35 Human Rights Violations against Minorities SC/ST and Trans-genders, Preventive Measures.	**13 hrs**
5	**Political issues:** Political Economic and Health Issues, Poverty, Unemployment, Corruption and Human Rights, Terrorism and Human Rights, Environment and Human Rights, Health and Human Rights	**12 hrs**
	TOTAL	**60 hrs**

Reference Books:

1. JagannathMohanty Teaching of Human sRights New Trends and Innovations Deep & Deep Publications Pvt. Ltd. New Delhi2009
2. Ram Ahuja: Violence Against Women Rawat Publications JewaharNager Jaipur.1998.
3. SivagamiParmasivam Human Rights Salem 2008
4. Hingorani R.C.: Human Rights in India: Oxford and IBA New Delhi.

At Aurangabad Instead of the Elective Course 'Nano biotechnology' 'HEALTH CARE ASSOCIATED INFECTIONS' has been proposed for MSc Medical Microbiology (3rd and 4th Semester). Rest of Syllabus and Assessment plan remains the same

MAHATMA GANDHI MISSION'S COLLEGE
N-6 CIDCO, AURANGABAD – 431003
MICROBIOLOGY DEPARTMENT

MSC Medical Microbiology

Elective Course

IN

HEALTH CARE ASSOCIATED INFECTIONS

CURRICULUM

TITLE OF THE COURSE: ELECTIVE COURSE IN HEALTH CARE ASSOCIATED INFECTIONS (HAIs)

Name of the Programme	**M. SC MEDICAL MICROBIOOLOGY**
Name of the Course	**HEALTH CARE ASSOCIATED INFECTIONS**

Course objective	1. The program in Health Care Associated Infections (HAIs) is organized to provide adequate Knowledge about health care associated infections. 2. To provide knowledge in control of HAIs in different settings in the hospital treatment and diagnostic areas. .
Course outcomes	At the successful completion of the course the student will: 1. Have knowledge of various routes of transmission HAIs and their prevention 2. Have knowledge off different principles and practices of surveillance of hospital acquired infections such as device associated infections (Ventilator associated pneumonia [VAP], Catheter associated urinary tract infections [CAUTI], and Central line associated blood stream infections [CLABSI]), surgical site infections (SSI) 3. Have knowledge of needle stick injury and post exposure prophylaxis 4. Have knowledge about use of Personal protective equipment and standard biosafety precautions. 5. Have knowledge of biomedical waste management. 6. Have knowledge ofGeneral aspects of antimicrobial resistance, control of antimicrobial resistance in health care facilities and MDR organisms. 7. Have knowledge about role of vaccination in reducing HAIs. 8. Have knowledge about management of blood spill with practical demonstration using simulated conditions. 9. Have knowledge of the role of hand hygiene in hospital acquired infection. 10. Have knowledge about environmental surveillance: Disinfection of OT & ICU and taking surveillance cultures from critical areas.

SYLLABUS / COURSE CONTENTS:

Sr No	TOPICS - Theory	Hours allotted -60 hrs
1	Introduction to HAIs, structure of HAIs program	2hrs
2	High Risk Areas And High Risk Procedures,	2hrs
3	Infection control In All common ICU's	6hrs
4	Infection control In Blood Bank Lab Infection control In Operation Theatre Infection control in OPD Infection control In Laboratory Infection control In Kitchen Infection control In Laundry Infection control for tuberculosis Infection control in labor room	10hrs
5	Major HAIs Types: CAUTI, CLABSI, VAP, SSI	10hrs
6	Surveillance of Major HAIs Types: CAUTI, CLABSI, VAP, SSI Data collection and analysis	10 hrs
7	Standard Universal Precautions Hand Hygiene Guidelines Transmission Based Precautions Needle Prick Injury/ Body Fluid Exposure. Needle Handling Policy Pre & post exposure Prophylaxis Of Health-Care Personnel	5 hrs
8	Decontamination Of The Environment, Equipment Disinfectants Used In Hospital	2hrs
9	Methods for testing efficacy of disinfectant	1hr
10	Antibiotic stewardship	2 hrs
11	Kitchen Sanitation	1hr
12	Decontamination Of Spillage	1hr
13	Methods For Microbiological Surveillance	2 hrs
14	Monitoring / Validation Of Sterilization Process, CSSD	2hr

15	Identification & Handling Of Outbreak Of Hospital Acquired Infection	1hr
16	BMW Management	3 hrs

Sr No	**TOPICS - Practical**	**Hours allotted -30 hrs**
1	Testing of RO and dialysis water Endotoxin testing	4hrs
2	Testing of disinfectants	2
3	Microbiology Air surveillance in OT- different methods Microbiological surveillance - anaerobic method	4
4	Identification of MRSA - Different methods	2
5	Identification of MDRS and ESBLs screening tests and confirmatory test	4
6	Monitoring of hand hygiene swab method	2
7	Hand hygiene measurement method	2
8	Maintenance of centrifuge, biosafety cabinet.	2
9	Sterilization - quality control	2
10	CSSD packaging and working, instruments	2
11	Disinfection of instruments endoscopes etc.	2
12	Biomedical Waste management	2
13	Water sampling and Coliform count	2
14	Screening of canteen workers fop bacterial and parasitic infections	2
15	Quality control and Quality assurance in bacteriology	2

REFERENCES

Title	Author /Editor
Essentials of hospital Infection Control	ApurbaSharty, Deepashree R
Hospital Associated Infections : Epidemiology , Prevention & Control	Nita Patawardhan
Ayliffe's Control of Heath Care associated infections	Fraise & Bradley
Textbook of microbiology	Ananthnarayan
Gradwohl's clinical lab Methods and diagnosis	A.C. SonnenwirthAnd Jarett
Topley and Wilson's Microbiology and Microbial infection	Topley & Wilson
Mackie & McCartney Practical medical Microbiology	Mackie McCartney
District laboratory practice in Tropical countries Part I & II	Monica cheesbrough
District laboratory practice in Tropical countries Part I & II	Monica cheesbrough

Evaluation Pattern for III rd and IV th Semester Exam (Core Subject)

Final Theory Marks will be 120 Marks (100 Marks University Theory Exam + 20 Marks Internal Assessment)

Theory Marks 100(Time 3 Hours)

Question Type	Marks Per Question	No. of Questions	Questions to be Answered	Questions X Marks	Total Marks
Brief Answer Questions	10	11	10	10 X 10	100

Practical Exam Pattern- Marks 100

Exercise	Description	Marks
Q No 1	Practical exercise	2 x25=50 M
Q No 2	Station exercise	5x5M=25 M
Q No 3	VIVA	25 M
		Total = 100 M

Internal Examination (Mid-Semester Exam)

Theory Marks 50 (Time 1 1/2 Hours)

Question Type	Marks Per Question	No. of Questions	Questions to be Answered	Questions X Marks	Total Marks
Brief Answer Questions	10	6	5	5 X 10	50

Practical Marks 50

Exercise	Description	Marks
Q No 1	**Practical exercise – 1**	1 x25=25 M
Q No 2	**Station exercise**	5x2M=10 M
Q No 3	**VIVA**	15 M
		Total = 50 M

For Calculation of Internal Assessment

The Marks obtained in Internal Examination out of 50 will be converted to out of 20 for Theory and Practical Internal Assessment.

Evaluation Pattern for III rd and IV th Semester Exam (Elective Subjects & PG Activity)

Elective Subjects

- III rd Semester students have a choice to select one Core Elective Subject out of the two as mentioned above; for which there will be Internal Evaluation exam for Theory and Practical.

- IV th Semester students have a choice to select one General Elective Subject out of the three mentioned above; for which there will be Internal Evaluation exam for Theory.

Evaluation Pattern for Elective Subject (Theory)- Time 3 Hrs

Section	Question	Marks Distribution	Marks Alloted per section	Marks
Section A	MCQ	10 X 1 M=10	10	10
Section B	SAQ LAQ	3/4 X 5 M= 15 2/3 X10 M= 20	15 20	35
Section C	SAQ LAQ	3/4 X 5 M= 15 2/3 X10 M= 20	15 20	35
				Total 80

Practical Exam Pattern

Exercise	Description	Marks
Q 1	**Practical Exercise**	1 X 20 = 20 M
Q 2	**Station Exercise**	2 X 5 = 10 M
Q 3	**Viva**	10 M
	Journal	10 M
		Total = 50 M

PG Activities

- The record of Clinical Postings, Dissertation/ Project/ Seminars will be maintained in Logbook. Each of the activity will be evaluated as per the evaluation format given in the Logbook and will be signed by the Departmental Co-ordinator before Semester end Examination.

Allotment of Marks for PG Activities

PG Activity	Marks Allotted
Clinical & Sectional Postings	20
Seminars/ Journal Clubs	20
Dissertation/ Project Work	20

The Marks obtained in the Internal Assessment, Elective Subjects and PG Activities to be sent to MGMIHS before the Semester End Examination as per the date announced by the university.

ACADEMIC SYLLABUS FOR SEMESTER- V

Name of the Programme	**M.Sc. MEDICAL MICROBIOLOGY**
Course Code	
Name of the Course	**MICROBIOLOGY Part 5**

Course Objective (Teaching Objectives)	• To teach detail Microbiological concepts related to Virology, Mycology, Parasitology
Course Outcomes (Learning Objectives)	• To understand detail Microbiological concepts of Virology, Mycology, Parasitology

Unit no.	THEORY TOPICS	No of lectures	Total Teaching Hours (60)
1	**Details of Virology**		**15Hrs**
	• General Properties of viruses -I & II	2	
	• Outline of diagnosis of viral diseases, Virus host interactions	1	
	• Bacteriophage, Pox viruses	1	
	• Herpes viruses, Adeno viruses	1	
	• Picorna viruses, Orthomyxoviruses	1	
	• Paramyxoviruses	1	
	• Arboviruses, Rhabdoviruses	2	
	• Hepatitis viruses	1	
	• Human immunodeficiency virus and AIDS	2	

	• Oncogenic viruses	1	
	• Novel Corona Virus - COVID-19	2	
2	**Details of Mycology**		**11Hrs**
	• Classification of fungi and general outline of diagnosis of fungal diseases.	1	
	• Classification of fungal diseases	2	
	• Fungi causing superficial infection	2	
	• Fungi causing subcutaneous mycoses	2	
	• Fungi causing systemic infection	2	
	• Fungi causing opportunistic infection	2	
3	**Details of Protozoology**		**10 Hrs**
	• E. histolytica and other amoebae	2	
	• Giardia, Trichomonas,	2	
	• Leishmaniadonovani and Trypanosomes	2	
	• Malarial Parasites , Babesia	2	
	• Toxoplasma gondii ,Sarcocystis	2	
4	**Details of Helminthology**		**24Hrs**
	• Introduction, General characters, classification	4	
	• Nematodes	5	
	• Cestodes	4	
	• Trematodes	3	
	• System wise Parasitic Infections.	4	
	• Parasitic Diseases In Aids	2	
	• Diagnostic Procedures Concentration Techniques.	2	
	Total		**60 HRS**

Unit no.	PRACTICAL TOPICS	No of Practicals	Total Teaching Hours
1	**Details of Virology**		
	• Arboviruses, Rhabdoviruses	1	**06Hrs**
	• Hepatitis , HIV	1	
	• Newer Viruses	1	
2	**Details of Mycology**		**06Hrs**
	• Fungi causing superficial infection	1	
	• Fungi causing subcutaneous mycoses	1	
	• Fungi causing systemic infection	1	
3	**Details of Protozoology**		
	• E. histolytica and other amoebae	1	
	• Giardia, Trichomonas,	1	**10Hrs**
	• Leishmaniadonovani and Trypanosomes	1	
	• Malarial Parasites , Babesia	1	
	• Toxoplasma gondii ,Sarcocystis	1	
4	**Details of Helminthology**		
	• Nematodes	1	
	• Cestodes	1	**08Hrs**
	• Trematodes	1	
	• Diagnostic Procedures Concentration Techniques.	1	
	Total		**30 HRS**

A. Evaluation Pattern for V th Semester University Exam

1. **Theory: Final Theory Marks will be 120 Marks (100 Marks University Theory Exam + 20 Marks Internal Assessment)**

   Theory Marks 100 (Time 3 Hours)

Question Type	Marks Per Question	No. of Questions	Questions to be Answered	Questions X Marks	Total Marks
Brief Answer Questions	10	11	10	10 X 10	100

2. **Practicals: Final Practical Marks will be 120 Marks (100 Marks University Practical Exam + 20 Marks Internal Assessment)**

   Practical Exam - Marks 100

Exercise	Description	Marks
Q No 1	Exercise 1	50
Q No 2	Exercise 2	25
Q No 3	VIVA	25
		Total = 100 M

(Exercise 1- Table Exercise/ Stations Excercise2- Table Exercise/ Spots)

B. Evaluation Pattern for Vth Semester Internal Examination

1. Theory: Theory Marks 50 (Time 1 1/2 Hours)

Question Type	Marks Per Question	No. of Questions	Questions to be Answered	Questions X Marks	Total Marks
Brief Answer Questions	10	6	5	5 X 10	50

Practical Marks 50

Exercise	Description	Marks
Q No 1	**Exercise -1**	25
Q No 2	**Exercise-2**	15
Q No 3	**VIVA**	10 M
		Total = 50 M

(Exercise 1- Table Exercise/ Stations Exercise 2- Table Exercise / Spots)

C. For Calculation of Internal Assessment

The Marks obtained in Internal Examination out of 50 will be converted to out of 20 for Theory and Practical Internal Assessment.

	Internal Exam Marks	Internal Assessment Marks
Theory	**50**	**20**
Practical	**50**	**20**

D. Assessment of PG Activities

- The record of Clinical Postings, Dissertation/ Project/ Seminars will be maintained in Logbook. Each of the activity will be evaluated as per the evaluation format given in the Logbook and will be signed by the Departmental Co-ordinator before Semester end Examination.

Allotment of Marks for PG Activities

PG Activity	**Marks Alloted**
Clinical & Sectional Postings	20
Seminars/ Journal Clubs	20
Dissertation/ Project Work	20

Note: The Marks obtained in the Internal Assessment and PG Activities to be sent to MGMIHS before the Semester End Examination as per the date announced by the university.

ACADEMIC SYLLABUS FOR SEMESTER- VI

Name of the Programme	**M.Sc. MEDICAL MICROBIOLOGY**
Course Code	
Name of the Course	**MICROBIOLOGY Part 6**

Course Objective (Teaching Objectives)	• To teach detail Microbiological concepts related to Applied Microbiology and Molecular Biology
Course Outcomes (Learning Objectives)	• To understand detail Microbiological concepts of Applied Microbiology and Molecular Biology

Unit no.	THEORY TOPICS	No of lectures	Total Teaching Hours (60)
1	**Quality management & Quality Control in Microbiology**		**13Hrs**
	• Total Quality Management including Quality Assurance & Quality Control	8	
	• Accreditation of Medical laboratory	3	
	• Laboratory Safety	2	
2	**Molecular Biology and recent advances in Diagnostic Microbiology**		**11 Hrs**
	• Molecular Diagnostic Methods in Microbiology	4	

	• ELISA and Immunochromatographic methods	3	
	• PCR and its various types	4	
3	**Epidemiological markers, Biological Warfare, Zoonotic diseases**		**6 Hrs**
	• Epidemiological Markers for diagnosis of Infectious diseases	2	
	• Biological Warfare Agents	2	
	• Zoonotic Diseases	2	
4	**Lab Diagnosis of various common clinical conditions**		**24 Hrs**
	• Meningitis and CNS Infections	4	
	• Respiratory Tract Infections	4	
	• Urinary Tract Infections	4	
	• Sexually Transmitted Diseases	2	
	• Diarrheal Diseases	2	
	• Pyogenic Infections	2	
	• Bacteraemia, Septicaemia and Infective Endocarditis	2	
	• Anaerobic Infections	4	
5	**Applied Microbiology**		**4 Hrs**
	Bacteriology of Air- OT Surveillance	2	
	Bacteriology of Water, Milk, Food	2	
6	**Emerging and Re-emerging Viral Infections**		**02 Hrs**
	• Corona Virus and nCOVID-19 disease	2	
	Total		**60 HRS**
Unit no.	**PRACTICAL TOPICS**	**No of Practicals**	**Total Teaching Hours (30)**

1	**Visit to Blood Bank**		**2 Hrs**
	• Sterility check in Blood Bank	1	
2	**Visit to Operation theatre**		**2Hrs**
	• OT Sterilisation	1	
3	**Visit to CSSD**		**6Hrs**
	• Sterilisation by Autoclave	1	
	• ETO Sterilisation	1	
	• Sterility Check by using Biological Indicator	1	
4	**Visit to ICU Areas**		**2Hrs**
	• Infection Control Practises in ICU Settings	1	
5	**Visit to Biomedical Waste Management Department**		**2Hrs**
	• Segragation of Hospital Waste	1	
6	**Molecular Biological Techniques for Diagnosis of Infectious Diseases**		**6 Hrs**
	• ELISA & Immunochromatography Methods	1	
	• PCR & Its Various Types	2	
7	**Coronavirus and COVID-19 disease**		**10 Hrs**
	• Donning and Doffing of PPE	1	
	• Testing of COVID – 19 Samples for Antigen	1	
	• Testing of COVID – 19 Samples for Antibody	1	
	• Testing of COVID – 19 Samples for RT-PCR	2	
	Total		**30 HRS**

A. Evaluation Pattern for VI th Semester Exam

1. **Theory: Final Theory Marks will be 120 Marks (100 Marks University Theory Exam + 20 Marks Internal Assessment)**

Theory Marks 100 (Time 3 Hours)

Question Type	Marks Per Question	No. of Questions	Questions to be Answered	Questions X Marks	Total Marks
Brief Answer Questions	10	11	10	10 X 10	100

2. **Practical Examination**

a. Practical Marks - Practical Exercise 50 Marks + Internal Assessment 20 marks

Exercise	Description	Marks
Q No 1	Excercise 1	25
Q No 2	Exercise 2	15
Q No 3	VIVA	10
		Total = 50 M

b. Thesis Evaluation – Marks 70

	Subject Knowledge	Objectives, Concept and Methodology	Result, Discussion and Outcome	External Examiner Viva	Internal Examiner Viva	Total Marks
Marks Alloted	**10**	**10**	**10**	**20**	**20**	**70**

B. Internal Examination

Theory Marks 50 (Time 1 1/2 Hours)

Question Type	Marks Per Question	No. of Questions	Questions to be Answered	Questions X Marks	Total Marks
Brief Answer Questions	10	6	5	5 X 10	50

Practical Marks 50

Exercise	Description	Marks
Q No 1	Exercise 1	15
Q No 2	Exercise 2	25
Q No 3	VIVA	10
		Total = 50 M

(Exercise 1- Table Exercise/ Spots Exercise 2- Thesis Defense/ Stations)

c. For Calculation of Internal Assessment

The Marks obtained in Internal Examination out of 50 will be converted to out of 20 for Theory and Practical Internal Assessment.

	Internal Exam Marks	Internal Assessment Marks
Theory	**50**	**20**
Practical	**50**	**20**

D. Assessment of PG Activities

- The record of Clinical Postings, Dissertation/ Project/ Seminars will be maintained in Logbook. Each of the activity will be evaluated as per the evaluation format given in the Logbook and will be signed by the Departmental Co-ordinator before Semester end Examination.

Allotment of Marks for PG Activities

PG Activity	**Marks Alloted**
Clinical & Sectional Postings	20
Seminars/ Journal Clubs	20

The Marks obtained in the Internal Assessment and PG Activities to be sent to MGMIHS before the Semester End Examination as per the date announced by the university.

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Academic Year 2019 – 2020

Academic Calendar For M.Sc. (3 Years) Medical Courses

(Anatomy, Physiology, Biochemistry, Pharmacology, Microbiology)

SCHEDULE OF ACTIVITY	DATES
Commencement of First Semester	01.08.2019
Receipt of completed Eligibility forms at MGMIHS from Respective college without late fees Receipt of completed Eligibility forms at MGMIHS from Respective college with late fees (Only for new admission)	On or before 30.10.2019 On or before 30.11.2019
Commencement of Internal Exam	3rd Week of November 2019
Winter Vacation for Staff	16.10.2019 to 15.11.2019
Notification of First Semester University Examination	As per MGMIHS
Commencement of First Semester University Examination	1 Week of January 2020
Conclusion of respective semesters	Last week of January 2020
Declaration of final Result	As per MGMIHS
Commencement of Second Semester	1st Week of February 2020
Commencement of Internal Examination	3rd Week of April 2010
Allotment of Guide for Dissertation	On or Before 30 th April 2020
Notification of Second Semester University Examination	As per MGMIHS
Summer Vacation for staff	01.05.2020 to 10.06.2020
Commencement of Second Semester University Examination	1 Week of July 2020
Conclusion of Second Semester	15 July 2020
Declaration of final Result	As per MGMIHS
Commencement of Next Academic Session	16.07.2020

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Academic Year 2020 – 2021

Academic Calendar For M.Sc. (3 Years) Medical Courses

(Anatomy, Physiology, Biochemistry, Pharmacology, Microbiology)

SCHEDULE OF ACTIVITY	DATES
Commencement of Third Semester	16.07.2020
Submission of Protocol for Scientific and Ethical Approval	14.08.2020
Commencement of Internal Exam	3rd Week of November 2020
Winter Vacation for Staff	16.10.2020 to 15.11.2020
Notification of First and Third Semester University Examination	As per MGMIHS
Commencement of Third Semester University Examination	1 Week of January 2021
Conclusion of respective semesters	15 January 2021
Declaration of final Result	As per MGMIHS
Commencement of Fourth Semester	3rd week of January 2021
Commencement of Internal Examination	2nd Week of April 2021
Notification of Fourth Semester University Examination	As per MGMIHS
Summer Vacation for staff	01.05.2021 to 10.06.2021
Commencement of Fourth Semester University Examination	3rd Week of June 2021
Conclusion of Respective Semesters	30 June 2021
Declaration of final Result	As per MGMIHS
Commencement of Next Academic Section	1.07.2021

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Academic Year 2021 – 2022

Academic Calendar For M.Sc. (3 Years) Medical Courses

(Anatomy, Physiology, Biochemistry, Pharmacology, Microbiology)

SCHEDULE OF ACTIVITY	DATES
Commencement of Fifth Semester	1.07.2021
Commencement of Internal Exam	3rd Week of November 2021
Winter Vacation for Staff	16.10.2021 to 15.11.2021
Notification of First, Third and Fifth Semester University Examination	As per MGMIHS
Commencement of Fifth Semester University Examination	First Week of December 2021
Conclusion of Fifth semester	Second Week of December 2021
Declaration of final Result	As per MGMIHS
Commencement of Sixth Semester	16 December 2021
Submission of Dissertation	31 March 2022
Commencement of Internal Examination	2nd Week of April 2022
Notification of Fourth Semester University Examination	As per MGMIHS
Summer Vacation for staff	01.05.2022 to 10.06.2022
Commencement of Sixth Semester University Examination	1st June 2022
Conclusion of Respective Semesters	30 June 2022
Declaration of final Result	As per MGMIHS

Resolution No. 2 of Academic Council (AC-42/2022): Resolved to approve the Action Taken Report (ATR) **[ANNEXURE-2]** on the decisions taken in the meeting of Academic Council with the following observations/discussion/decision:

i) Resolved to amend Resolution No. 3.5 of AC-41/2021 dt. 27/08/2021 by including five (05) M.Sc. Medical courses. The amended Resolution is as mentioned below -

Amended Resolution No. 3.5 of AC-41/2021 dt. 27/08/2021 : Resolved to incorporate the changes as per the decisions of the CBCS committee in UG (B.Sc. Medical Dialysis Technology, B.Sc. Medical Laboratory Technology, B.Sc. Medical Radiology & Imaging Technology, B. Optometry, B.Sc. Cardiac Care Technology, B.Sc. Operation Theatre &Anaesthesia Technology, B.Sc. Perfusion Technology) ; PG (M.Sc. Medical Biotechnology, M.Sc. Medical Genetics, M.Sc. Clinical Embryology, M.Sc. Molecular Biology, Master of Public Health, Master in Hospital Administration, M.Sc. Cardiac Care Technology, M.Sc. Biostatistics, M.Sc. Medical Radiology & Imaging Technology, M. Optometry, M.Sc. Clinical Nutrition) and M.Sc. Medical (Anatomy, Physiology, Biochemistry, Microbiology, Pharmacology) courses with effect from the batch admitted in 2020-21 onwards.

Resolution No. 10.4 of Academic Council (AC-42/2022):

i) Resolved to accept “50% eligibility in internal assessment” pattern for all the CBCS programs (UG & PG) running under the constituent units of MGMIHS .(MGM School of Biomedical Sciences , MGM School of Physiotherapy, MGM Medical College (M.Sc. Medical 3 year courses)

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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