O/C

MGM INSTITUTE OF HEALTH SCIENCES

Accredited by NAAC with 'A' Grade

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

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CHOICE BASED CREDIT SYSTEM (CBCS)

(With effect from 2019-20 Batches)

(For Sem I & Sem II)

Curriculum for M.Sc Medical Physiology

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Sciences
(Deemed University u/s 3 of UGC Act, 1956)
Navi Mumbai- 410 209

Approved as per BOM –57/2019, [Resolution No. 3.2.1.6.i], Dated 26/04/2019

22-6-2026.

MGM INSTITUTE OF HEALTH SCIENCES, NAVI MUMBAI

LEARNING OUTCOME BASED CURRICULAM FRAMEWORK

MSc. Medical Physiology Course

Sr. No.		
1	Objectives	• **Learning Objectives No.1 : Acquisition of Knowledge** A post graduate student upon successfully qualifying in the M.Sc Medical physiology examination should be able to : 1. Understand and deal with all aspects of general, systemic and applied Physiology. 2. Teach effectively the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases (pathophysiology) affecting various organ systems and the physiological basis of their management to undergraduate medical, paramedical and all other basic science students. 3. Understand general principles of medical education (use of appropriate teaching techniques and resources). 4. Interpret and evaluate research publications critically. 5. Use the library facilities (Literature database using computer, CD ROM, internet search and any other available newer techniques). 6. Conduct relevant research which may have significant bearing on human health and patient care. 7. Interpret the research findings in the light of its basic and applied significance. 8. Acquire skills in conducting collaborative research in the field of physiology with allied sciences, clinical sciences and biomedical engineering. 9. Interact with the allied departments and render services in advanced laboratory investigations. 10. Acquire administrative skills to set up concerned department / laboratories 11. Function as a member of a teaching or research team. • **Learning Objectives No.2 : Teaching and Training** The student should be able to effectively teach the basic physiological mechanisms of human body with reference to their implications in the pathogenesis of diseases (pathophysiology) and their management to undergraduate students in medicine (MBBS) and allied health science courses (Dentistry, Nursing, Physiotherapy, BSc.allied

		sciences). Plan, execute and evaluate teaching assignments in Medical Physiology. Conduct research. Participate actively in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research. • **Learning Objectives No.3 : Research** The student should be able to carry out a research project (both basic and clinical) from planning to publication and be able to pursue academic interests and continue life-long learning to become more experienced in all the above areas .
2	Generic Graduate Attributes	**Scholarly Attitude :** At the end of the course the student shall be able to: 1. Conduct experiments designed for study of physiological phenomena. 2. Interpret experimental/ investigate data. 3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory • Encouraged to participate in seminars ,workshop, conferences/CME. **Research Aptitude :** • Encouraged to apply for research funding, ICMR Fellowship • Research Methodology training programs • Plan, execute, analyze and present the research work in Medical Physiology at various conferences. • Encouraged to write papers and publish them in Indexed journals. **Exemplary Leadership** • Organizes/ helps in organizing various conferences, CMEs and workshops • Organizes cultural festivals, Annual fest Student magazines
3	Desired Learning Outcomes of Degree	**Element of Critical thinking** In addition to didactic lectures to provide a holistic education students are exposed to the following teaching-learning practices/programs • Journal Clubs • Slide discussions

		• Seminars • Participate in workshop, conferences/CME. **Dynamic Professionalism** • Encouraged to participate in various conferences, CMEs and workshops and do paper presentations (Oral/Poster).
4	Proportion of knowledge / Skill / Soft Skill in Curriculum	**Knowledge** Understand and Teach all aspects of general, systemic and applied human body Physiology. **Skills** Haematology practicals, amphibian & mammalian experiments, human experiments, Clinical examination of various systems. **Soft skills** Effective Communication Skills • Microteaching • Formative and summative assessment of Communication and teaching skills in the form of Microteaching & seminar presentations
5	Curriculum and Employability	**Global Competencies :** Teaching Medical Physiology Research Physiological laboratories(PFT, ECG,NCV) Yoga Exercise Physiology Food & nutrition

Annexure – G – IIb

ACADEMIC SYLLABUS FOR SEMESTER-II

Name of the Programme	**M. SC MEDICAL PHYSIOLOGY**
Course Code	
Name of the Course	**Physiology Part2**

Course Objective (Teaching Objectives)	To teach basic physiological concepts related to Gastrointestinal system, Excretory system, Endocrine system, Reproductive system, Central Nervous system, special senses
Course Outcomes (learning Objectives)	• To understand the basic physiological concepts of Gastrointestinal system • To understand the basic physiological concepts of Excretory system, • To understand the basic physiological concepts of Endocrine system • To understand the basic physiological concepts of Reproductive system • To understand the basic physiological concepts of Central Nervous system • To understand the basic physiological concepts of special senses

Unit no.	**Theory Topics**	**Hours allotted No. of-45hrs**
1	**GIT** 1. Introduction – functional organisation & innervation 2. Salivary secretion, Deglutition 3. Stomach: Structure, Motor function of stomach, Gastric secretion 4. Liver-functions, bile secretion 5. Pancreas – Pancreatic juice secretion 6. Small intestine – movements, function defecation 7. Large intestine - movements, function defecation 8. Digestion & absorption of carbohydrates, fats & proteins	**8 Hours**
2.	**Excretory system** 1. Functional anatomy, Nephron, Functions of kidney 2. Glomerular filtration 3. Tubular Reabsorption and secretion 4. Concentration & dilution of urine 5. Physiology of Micturition 6. Regulation of body temperature	**6 Hrs**
3	**Endocrine** 1. Introduction – mechanism of hormone action 2. Pituitary – anterior, posterior, Growth Hormone, ADH, Oxytocin 3. Thyroid Hormones 4. Adrenocortical hormones 5. Adrenal medulla 6. Parathormone, calcitonin, vitamin D 7. Endocrine Pancreas-Insulin	**7 Hrs**

4	**Reproduction** 1. Male reproductive system Functional anatomy Spermatogenesis, Testosterone 2. Female reproductive system-functional anatomy, menstrual cycle 3. Estrogen, Progesterone 4. Pregnancy, Lactation 5. Contraception	**4 Hrs**
5	**CNS** 1. Organization of nervous system 2. Synapse 3. Receptors 4. Reflex 5. Sensory system 6. Motor system 7. Autonomic nervous system 8. Cerebellum 9. Basal ganglia, Thalamus 10. Hypothalamus, limbic system 11. Cerebral cortex, Higher functions 12. Muscle tone, Posture, Equilibrium, vestibular apparatus	**13 Hrs**
6	**Special Senses** 1. Eye structure, optics 2. Accommodation, Errors of refraction 3. Photochemistry of vision, color vision 4. Visual pathway 5. Hearing functional anatomy 6. Mechanism of hearing 7. Taste, olfaction	**7 Hrs**
	Total	**45 Hours**

Unit no.	Tutorial Topics	Hours allotted No. of 15-hrs
1.	Gastric secretion	**15 Hrs**
2.	Liver-functions, bile secretion	
3.	Glomerular filtration Rate	
4.	Physiology of Micturition	
5.	. Thyroid Hormones	
6.	Diabetes Mellitus- Insulin	
7.	Menstrual cycle	
8.	Synapse	
9.	Receptors	
10.	Descending Tracts	
11.	Ascending Tracts	
12.	Cerebellum	
13.	Hypothalamus	
14.	Accommodation, Errors of refraction	
15.	Mechanism of hearing	

	Practical Topics	Hours allotted No. of 30hrs
	Clinical examination (Practical) 1. Sensory system 2. Motor system I & II 3. Visual acuity & color vision 4. Tests for hearing & deafness	**18 Hours**
	Charts **Endocrine photographs** 1. Gigantism 2. Dwarfism 3. Acromegaly 4. Grave's disease 5. Myxedema 6. Cretinism 7. Cushing syndrome 8. Carpopedal spasm	**10 Hours**
	Renal 1. Calculation:- i. Effective filtration pressure (EFP) ii. Clearance creatinine, urea, inulin, PAH 2. Cystometrogram	
	Perimetry (Demonstration)	**2 Hours**
	Total	**30 hrs**

List of the Books recommended
MSc- Medical Physiology

	Name of the books	**Author/Editor**
Semester I & II	Concise Human Physiology	A K Jain
	Essential of Medical Physiology	K Sembulingam
	Physiology:- Prep Manual For Undergraduates	Joshi V d
	Manual of Practical Physiology	A k Jain

Annexure – G – IIa

ACADEMIC SYLLABUS FOR SEMESTER-I

Name of the Programme	**M. SC MEDICAL PHYSIOLOGY**
Course Code	
Name of the Course	**PHYSIOLOGY Part1**

Course Objective (Teaching Objectives)	• To teach basic physiological concepts related to General Physiology, Haematology, Nerve Muscle Physiology, Respiratory and Cardiovascular physiology
Course Outcomes (learning Objectives)	• To understand the basic physiological concepts of General physiology • To understand the basic physiological concepts of Haematology, • To understand the basic physiological concepts of Nerve Muscle Physiology, • To understand the basic physiological concepts of Respiratory physiology • To understand the basic physiological concepts of Cardiovascular physiology

Unit no.	**Theory Topics**	**Hours allotted No. of 45hrs**
1.	**General Physiology** • Homeostasis, feedback mechanisms • Structure & function of cell & organelles • Transport across Cell Membrane	**4 hrs**
2.	**Hematology** • Composition 7 functions of blood, plasma protein • RBC, Erythropoeisis • Haemoglobin, Anaemia • Blood Groups • WBC • Immunity • Haemostasis • platelets • Coagulation of blood • Lymph, reticuloendothelial / Tissue Macrophage System	**10 Hrs**
3.	**Nerve Muscle Physiology** • Structure, function & classification of Nerve Fibres • Properties of Nerve Fibres • Resting membrane Potential, Action Potential • Neuromuscular Junction • Structure of skeletal muscle • Mechanism of muscle contraction, Excitation Contraction coupling • Properties of skeletal muscle	**8 Hrs**

4.	**Respiratory System** • Introduction, physiological anatomy& Functions of RS • Lung volume & capacities • Mechanism of breathing • Diffusion • Transport of O2 • Transport of Co2 • Neural Regulation • Chemical regulation • Hypoxia	**10 Hrs**
5.	**Cardiovascular system** • Introduction – functional anatomy, structure of cardiac muscle • Properties of cardiac muscle • Cardiac impulse • ECG • Cardiac cycle • Cardiac output • CVS regulation • Heart Rate • Blood Pressure • Hemodynamics • Coronary circulation	**13 Hrs**
	Total	**45 HRS**

Unit no.	Tutorial Topics	Hours allotted No. of 15hrs
1.	Transport of cell	**1**
2.	Erythropoeisis	**1**
3.	Blood Groups	**1**
4.	Resting membrane potential & Action Potential	**1**
5.	Hemostasis	**1**
6.	Immunity	**1**
7.	E-C coupling & Mechanism of contraction	**1**
8.	Mechanism of breathing	**1**
9.	Neuromuscular Junction	**1**
10.	Transport of O2 & CO2	**1**
11.	Regulation of respiration	**1**
12.	Cardiac impulse	**1**
13.	ECG	**1**
14.	Cardiac output	**1**
15.	Blood pressure & its regulation	**1**
	Total	**15hrs**

Unit no.	Practical Topics	Hours allotted No. of 30 hrs
1.	**Haematology** 1. Microscope, collection of blood 2. smear preparation 3. Haemoglobin 4. Total Leukocyte count 5. RBC count 6. DLC 7. BT & CT 8. Blood Group	**19hrs**
2.	**Clinical** 1. General Physical Examination 2. Pulse 3. Blood pressure	**7 Hrs**
3.	**Human Experiments** 1. Spirometry 2. ECG	**4Hrs**
	Total	**30 HRS**

REFERENCE BOOKS:

List of the books recommended
MSc- Medical Physiology

Semester	Name of the Books	Author/ Editor
I&II	Concise Human Physiology	A K Jain
	Essential Of Medical Physiology	K Sembulingam
	Physiology: Prep Manual For Undergraduates	Joshi, V.D.
	Manual of Practical Physiology	A K Jain

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

Name of the Degree: M.Sc. MEDICAL PHYSIOLOGY

AIMS OF THE PROGRAM

Physiologistis in demand in today's Sports, Yoga & nutrition fields in India & abroad

APhysiology Postgraduate has a career as teaching faculty with research aptitude and ability of applying physiology to clinical fields.

Postgraduate qualification Physiology can earn to placements in Medical teaching institute,research laboratories run by the government and the corporate sector. Private sector placements are in teaching,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 Physiology. 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 Physiologist in a Medical set up or as a Research Associate in Research Laboratories, also as Exercise Physiologist-Training of sports people, Nutrition Physiologist: Sensory – metabolic interactions in control of food intake, ontogeny of food habits and food preferences&As researcher in yoga :Stress, life style and its impact on mind body interactions**.**

Duration of Study: The duration of the study for M.Sc. Medical Physiology 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., 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

Name of the Degree: M.Sc. MEDICAL PHYSIOLOGY

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Postgraduate qualification Physiology can earn to placements in Medical teaching institute,research laboratories run by the government and the corporate sector. Private sector placements are in teaching,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 Physiology. 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 Physiologist in a Medical set up or as a Research Associate in Research Laboratories, also as Exercise Physiologist-Training of sports people, Nutrition Physiologist: Sensory – metabolic interactions in control of food intake, ontogeny of food habits and food preferences&As researcher in yoga :Stress, life style and its impact on mind body interactions**.**

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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., Bachelor's Degree in Agricultural, Veterinary and Fishery Sciences, or equivalent examination with a minimum aggregate score of 50%.

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CURRICULUM FOR M. Sc. MEDICAL PHYSIOLOGY

1st YEAR

Semester I							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP101T	**Medical Anatomy**	**4**	**4**	**20**	**60**	**80**
	MP102T	**Medical Physiology**	**4**	**4**	**20**	**60**	**80**
	MP103T	**Medical Biochemistry**	**4**	**4**	**20**	**60**	**80**
	MP104T	**Medical Pharmacology**	**4**	**4**	**20**	**60**	**80**
	MP105T	**Medical Microbiology**	**4**	**4**	**20**	**60**	**80**
	Practical						
	MP101P	**Medical Anatomy**	**1**	**2**	**20**	**50**	**70**
	MP102P	**Medical Physiology**	**1**	**2**	**20**	**50**	**70**
	MP103P	**Medical Biochemistry**	**1**	**2**	**20**	**50**	**70**
	MP104P	**Medical Pharmacology**	**1**	**2**	**20**	**50**	**70**
	MP105P	**Medical Microbiology**	**1**	**2**	**20**	**50**	**70**
	Total		**25**	**30**	**200**	**550**	**750**

CURRICULUM FOR M. Sc. MEDICAL PHYSIOLOGY

1st YEAR

Semester I							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP101T	**Medical Anatomy**	**4**	**4**	**20**	**60**	**80**
	MP102T	**Medical Physiology**	**4**	**4**	**20**	**60**	**80**
	MP103T	**Medical Biochemistry**	**4**	**4**	**20**	**60**	**80**
	MP104T	**Medical Pharmacology**	**4**	**4**	**20**	**60**	**80**
	MP105T	**Medical Microbiology**	**4**	**4**	**20**	**60**	**80**
	Practical						
	MP101P	**Medical Anatomy**	**1**	**2**	**20**	**50**	**70**
	MP102P	**Medical Physiology**	**1**	**2**	**20**	**50**	**70**
	MP103P	**Medical Biochemistry**	**1**	**2**	**20**	**50**	**70**
	MP104P	**Medical Pharmacology**	**1**	**2**	**20**	**50**	**70**
	MP105P	**Medical Microbiology**	**1**	**2**	**20**	**50**	**70**
	Total		**25**	**30**	**200**	**550**	**750**

SEMESTERII

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP201T	**Medical Anatomy**	**4**	**4**	**20**	**60**	**80**
	MP202T	**Medical Physiology**	**4**	**4**	**20**	**60**	**80**
	MP203T	**Medical Biochemistry**	**4**	**4**	**20**	**60**	**80**
	MP204T	**Medical Pharmacology**	**4**	**4**	**20**	**60**	**80**
	MP205T	**Medical Microbiology**	**4**	**4**	**20**	**60**	**80**
	MP206T	**Research Methodology & Biostatistics (Core Course)**	**4**	**4**	**20**	**60**	**80**
	Practical						
	MP201P	**Medical Anatomy**	**1**	**2**	**20**	**50**	**70**
	MP202P	**Medical Physiology**	**1**	**2**	**20**	**50**	**70**
	MP203P	**Medical Biochemistry**	**1**	**2**	**20**	**50**	**70**
	MP204P	**Medical Pharmacology**	**1**	**2**	**20**	**50**	**70**
	MP205P	**Medical Microbiology**	**1**	**2**	**20**	**50**	**70**
	MP206P	**Research Methodology & Biostatistics (Core Course)**	**1**	**2**	**20**	**50**	**70**
	Total		**30**	**36**	**240**	**660**	**900**

SEMESTERII

	Syllabus Ref. No.	Subject	Credits	Teaching hours	Marks		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP201T	**Medical Anatomy**	**4**	**4**	**20**	**60**	**80**
	MP202T	**Medical Physiology**	**4**	**4**	**20**	**60**	**80**
	MP203T	**Medical Biochemistry**	**4**	**4**	**20**	**60**	**80**
	MP204T	**Medical Pharmacology**	**4**	**4**	**20**	**60**	**80**
	MP205T	**Medical Microbiology**	**4**	**4**	**20**	**60**	**80**
	MP206T	**Research Methodology & Biostatistics (Core Course)**	**4**	**4**	**20**	**60**	**80**
	Practical						
	MP201P	**Medical Anatomy**	**1**	**2**	**20**	**50**	**70**
	MP202P	**Medical Physiology**	**1**	**2**	**20**	**50**	**70**
	MP203P	**Medical Biochemistry**	**1**	**2**	**20**	**50**	**70**
	MP204P	**Medical Pharmacology**	**1**	**2**	**20**	**50**	**70**
	MP205P	**Medical Microbiology**	**1**	**2**	**20**	**50**	**70**
	MP206P	**Research Methodology & Biostatistics (Core Course)**	**1**	**2**	**20**	**50**	**70**
	Total		**30**	**36**	**240**	**660**	**900**

2ND YEAR

SEMESTERIII							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP301T	1.General Physiology 2. Blood 3.Nerve-Muscle physiology	4	4	20	60	80
		Core Elective course**	4	4	Internal Exam 80 Marks		
	MP302CET	Clinical Nutrition					
	MP303CET	Neurophysiology					
	MP304	Clinical Postings	6	18	50		50
	MP305	Dissertation/Project Proposal*	5	10	50	-	50
	MP306	Seminar	2	2	50		50
	Practical						
	MP301P	1. Blood: Haematology Practicals 2.Nerve-Muscle physiology:- Amphibian graphs Human experiment graphs	2	4	20	50	70
	MP302CEP MP303CEP	Core Elective practical • Clinical nutrition • Neurophysiology	1	2	Internal Exam 70 Marks		
		Total	24	44	190	110	300

2ND YEAR

SEMESTERIII							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP301T	1.General Physiology 2. Blood 3.Nerve-Muscle physiology	4	4	20	60	80
		Core Elective course**	4	4	Internal Exam 80 Marks		
	MP302CET	Clinical Nutrition					
	MP303CET	Neurophysiology					
	MP304	Clinical Postings	6	18	50		50
	MP305	Dissertation/Project Proposal*	5	10	50	-	50
	MP306	Seminar	2	2	50		50
	Practical						
	MP301P	1. Blood: Haematology Practicals 2.Nerve-Muscle physiology:- Amphibian graphs Human experiment graphs	2	4	20	50	70
	MP302CEP MP303CEP	Core Elective practical • Clinical nutrition • Neurophysiology	1	2	Internal Exam 70 Marks		
		Total	24	44	190	110	300

Semester IV							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP401T	**Systems:** 1. Respiratory system 2.Cardiovascular system 3.Gastrointestinal system 4. Food & Nutrition	4	4	20	60	80
		General elective **	4	4			
	MP402GE	Bioethics, Biosafety, IPR & Technology Transfer	**Internal Exam of 80 Marks**				
	MP403GE	Disaster Management and Mitigation Resources					
	MP404GE	Human rights					
	MP405	Clinical Postings	7	21	50		50
	MP406	Dissertation / Project*	5	10	50		50
	MP407	Seminar	2	2	50		50
	Practical						
	MP401P	**i.Clinical examination:** 1.Respiratory system 2.Cardiovascular system 3.Alimentory system **ii**.Amphibian graphs iii.Human experiment graphs iv.Mammalian graphs v.Practicals for food & nutrition	2	4	20	50	70
		Total	24	45	190	110	300

Semester IV							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP401T	**Systems:** 1. Respiratory system 2.Cardiovascular system 3.Gastrointestinal system 4. Food & Nutrition	4	4	20	60	80
		General elective **	4	4			
	MP402GE	Bioethics, Biosafety, IPR & Technology Transfer	**Internal Exam of 80 Marks**				
	MP403GE	Disaster Management and Mitigation Resources					
	MP404GE	Human rights					
	MP405	Clinical Postings	7	21	50		50
	MP406	Dissertation / Project*	5	10	50		50
	MP407	Seminar	2	2	50		50
	Practical						
	MP401P	**i.Clinical examination:** 1.Respiratory system 2.Cardiovascular system 3.Alimentory system **ii**.Amphibian graphs iii.Human experiment graphs iv.Mammalian graphs v.Practicals for food & nutrition	2	4	20	50	70
		Total	24	45	190	110	300

III[rd] YEAR

Semester V							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP501T	1.Excretory system 2.Endocrine system 3.Reproductive system 4.Exercise Physiology	4	4	20	60	80
	MP502	Clinical Postings	6	18	50		50
	MP503	Dissertation / Project*	12	24	50		50
	Practical						
	MP501P	Practicals:- Excretory system Endocrine system Reproductive system Exercise Physiology	1	2	20	50	70
		Total	23	46	140	110	250

SEMESTERVI							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP601T	Central Nervous system Special senses	4	4	20	60	80
	MP602	Clinical Postings	6	18	50		50
	MP603	Dissertation / Project*	12	24		100	100
	Practical						
	MP601P	**Clinical examination in** : Central Nervous system Special senses	2	4	20	50	70
		Total	24	50	90	210	300

III[rd] YEAR

Semester V							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP501T	1.Excretory system 2.Endocrine system 3.Reproductive system 4.Exercise Physiology	4	4	20	60	80
	MP502	Clinical Postings	6	18	50		50
	MP503	Dissertation / Project*	12	24	50		50
	Practical						
	MP501P	Practicals:- Excretory system Endocrine system Reproductive system Exercise Physiology	1	2	20	50	70
		Total	23	46	140	110	250

SEMESTERVI							
	Syllabus Ref. No.	**Subject**	**Credits**	**Teaching hours**	**Marks**		
	Theory				**Internal Assessment**	**Semester Exam**	**Total**
	MP601T	Central Nervous system Special senses	4	4	20	60	80
	MP602	Clinical Postings	6	18	50		50
	MP603	Dissertation / Project*	12	24		100	100
	Practical						
	MP601P	**Clinical examination in** : Central Nervous system Special senses	2	4	20	50	70
		Total	24	50	90	210	300

*(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.

*(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.

Annexure G - IV

Outline of course curriculum

MSc-Medical Courses (2019-20 batch)

Semester -I

		Hrs/week					Hrs/semester				Exam Marks		
Code No.	Core subjects	Lecture/week	Tutorial/week	Practical hrs/week	Total Hrs /week	Total Credits/week	Lecture/ semester	Tutorial/ semester	Practical/ semester	Total hours	IA	semester Exam	Total marks
Theory													
	Anatomy	3	1		4	4	45	15		60	20	60	80
	Physiology	3	1		4	4	45	15		60	20	60	80
	Biochemistry	3	1		4	4	45	15		60	20	60	80
	Pharmacology	3	1		4	4	45	15		60	20	60	80
	Microbiology	3	1		4	4	45	15		60	20	60	80
Practical													
	Anatomy			2	2	1			30	30	20	50	70
	Physiology			2	2	1			30	30	20	50	70
	Biochemistry			2	2	1			30	30	20	50	70
	Pharmacology			2	2	1			30	30	20	50	70
	Microbiology			2	2	1			30	30	20	50	70
	Total					25				450			750

Total Marks for IA	
Theory	Practical
30	30

Theory Internal Assement	
Theory	15
Seminar	5
Total	20

Practical Internal Assement	
Practical	15
Journal	5
Total	20

Annexure G - V

Outline of course curriculum
MSc-Medical Courses (2019-20 batch)
Semester -II

		Hrs/week					Hrs/semester				Exam Marks		
Code No.	Core subjects	Lecture/ week	Tutorial/ week	Practical hrs/week	Total Hrs /week	Total Credits/ week	Lecture/ semester	Tutorial/ semester	Practical/ semester	Total hours	IA	semester Exam	Total marks
Theory													
	Anatomy	3	1		4	4	45	15		60	20	60	80
	Physiology	3	1		4	4	45	15		60	20	60	80
	Biochemistry	3	1		4	4	45	15		60	20	60	80
	Pharmacology	3	1		4	4	45	15		60	20	60	80
	Microbiology	3	1		4	4	45	15		60	20	60	80
	Research Methodology & Biostatistics	4			4	4	60			60	20	60	80
Practical													
	Anatomy			2	2	1			30	30	20	50	70
	Physiology			2	2	1			30	30	20	50	70
	Biochemistry			2	2	1			30	30	20	50	70
	Pharmacology			2	2	1			30	30	20	50	70
	Microbiology			2	2	1			30	30	20	50	70
	Research Methodology & Biostatistics			2	2	1			30	30	20	50	70
	Total					30				540			900

Total Marks for IA	
Theory	Practical
30	30

Theory Internal Assement	
Theory	15
Seminar	5
Total	20

Practical Internal Assement	
Practical	15
Journal	5
Total	20

Assessment Pattern for MSc Medical Courses (2019 Onwards)

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:

2.1 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.

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

2.3 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

3.1 The minimum passing head shall be 50% in both Theory and practicals separately including the internal assessment.

3.2 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. (From IIIrdSem 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:

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

6.2 A candidate shall not be allowed to appear in the final semester examination unless the candidate has 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

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

8.2 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.

8.3 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.

8.4 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.

8.5 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.

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

8.7 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.

8.8 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.

8.9 Supplementary examination: There shall be no supplementary examination

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

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

8.12 Theory Question Paper Pattern for Core Subjects in University Examinations

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.

8.14 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

8.15 Breakup of theory IA calculation for 20 marks

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

8.16 Internal Examination Pattern (Practical): 30 Marks

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

8.17 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.

MGM Institute of Health Sciences, Navi Mumbai

MGM MEDICAL COLLEGE

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

MGM Institute of Health Sciences, Navi Mumbai

MGM MEDICAL COLLEGE

Academic Year 2019 – 2020

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

MGM Institute of Health Sciences, Navi Mumbai

MGM MEDICAL COLLEGE

Academic Year 2019 – 2020

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