



MGM INSTITUTE OF HEALTH SCIENCES

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

Grade 'A' Accredited by NAAC

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MGM INSTITUTE OF HEALTH SCIENCES, NAVI MUMBAI

LEARNING OUTCOME BASED CURRICULAM FRAMEWORK

MSc. Medical Physiology Course

Sr. No.		Program Outcomes
1	Objectives	<ul style="list-style-type: none">• 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 :<ol style="list-style-type: none">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 / laboratories11. 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

		<p>sciences).</p> <p>Plan, execute and evaluate teaching assignments in Medical Physiology.</p> <p>Conduct research. Participate actively in various workshops/seminars/journal clubs/demonstration in the allied departments, to acquire various skills for collaborative research.</p> <ul style="list-style-type: none"> • 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	<p>Scholarly Attitude : At the end of the course the student shall be able to:</p> <ol style="list-style-type: none"> 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 <ul style="list-style-type: none"> • Encouraged to participate in seminars ,workshop, conferences/CME. <p>Research Aptitude :</p> <ul style="list-style-type: none"> • 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. <p>Exemplary Leadership</p> <ul style="list-style-type: none"> • Organizes/ helps in organizing various conferences, CMEs and workshops • Organizes cultural festivals, Annual fest Student magazines
3	Desired Learning Outcomes of Degree	<p>Element of Critical thinking In addition to didactic lectures to provide a holistic education students are exposed to the following teaching-learning practices/programs</p> <ul style="list-style-type: none"> • Journal Clubs • Slide discussions

		<ul style="list-style-type: none"> • Seminars • Participate in workshop, conferences/CME. <p>Dynamic Professionalism</p> <ul style="list-style-type: none"> • Encouraged to participate in various conferences, CMEs and workshops and do paper presentations (Oral/Poster).
4	Proportion of knowledge / Skill / Soft Skill in Curriculum	<p>Knowledge Understand and Teach all aspects of general, systemic and applied human body Physiology.</p> <p>Skills Haematology practicals, amphibian & mammalian experiments, human experiments, Clinical examination of various systems.</p> <p>Soft skills Effective Communication Skills</p> <ul style="list-style-type: none"> • Microteaching • Formative and summative assessment of Communication and teaching skills in the form of Microteaching & seminar presentations
5	Curriculum and Employability	<p>Global Competencies : Teaching Medical Physiology Research Physiological laboratories(PFT, ECG,NCV) Yoga Exercise Physiology Food & nutrition</p>

Course Outcomes

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)	<ul style="list-style-type: none"> • 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

<p>4</p>	<p>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</p>	<p>4 Hrs</p>
<p>5</p>	<p>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</p>	<p>13 Hrs</p>
<p>6</p>	<p>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</p>	<p>7 Hrs</p>
<p></p>	<p>Total</p>	<p>45 Hours</p>

	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

ACADEMIC SYLLABUS FOR SEMESTER-I

Name of the Programme	M. SC MEDICAL PHYSIOLOGY
Course Code	
Name of the Course	PHYSIOLOGY PartI

Course Objective (Teaching Objectives)	<ul style="list-style-type: none"> To teach basic physiological concepts related to General Physiology, Haematology, Nerve Muscle Physiology, Respiratory and Cardiovascular physiology
Course Outcomes (learning Objectives)	<ul style="list-style-type: none"> 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

<u>Unit no.</u>	Theory Topics	Hours allotted No. of 45hrs
1.	General Physiology <ul style="list-style-type: none"> Homeostasis, feedback mechanisms Structure & function of cell & organelles Transport across Cell Membrane 	4 hrs
2.	Hematology <ul style="list-style-type: none"> Composition & functions of blood, plasma protein RBC, Erythropoiesis Haemoglobin, Anaemia Blood Groups WBC Immunity Haemostasis platelets Coagulation of blood Lymph, reticuloendothelial / Tissue Macrophage System 	10 Hrs
3.	Nerve Muscle Physiology <ul style="list-style-type: none"> 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.	<p>Respiratory System</p> <ul style="list-style-type: none"> • 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.	<p>Cardiovascular system</p> <ul style="list-style-type: none"> • 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.	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	
2.	Clinical 1. General Physical Examination 2. Pulse 3. Blood pressure	
3.	Human Experiments 1. Spirometry 2. ECG	
	Total	30 HRS


Dr. Rajesh B. Goel
 Registrar
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