MGM INSTITUTE OF HEALTH SCIENCES

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

B.Sc. Cardiac Care Technology

Amended upto BOM -55/2018, Dated 27/11/2018

Amended History

1. Approved as per BOM - 23/2012, Item No. 4, Dated 30/3/2012.
2. As Amended in BOM - 35/2014 [Resolution No. 4.6(f)], Dated 26/04/2014.
3. As Amended in BOM - 37/2014 [Resolution No. 3.6(i)], Dated 29/07/2014.
4. As Amended in BOM - 43/2015 [Resolution No. 3.3(d)], Dated 06/11/2015.
5. As Amended in BOM - 48/2017 [Resolution No.5.11], Dated 24/01/2017.
6. As Amended in BOM -51/2017, [Resolution No.1.3.14.3], [Resolution No.1.3.14.4] Dated 28/08/2017.
7. As Amended in BOM -55/2018 [Resolution No. 4.13], Dated 27/11/2018.

Annexure XVII

Curriculum for

B.Sc. (Cardiac Technology)

IN PURSUIT OF EXCELLENCE

MGM INSTITUTE OF HEALTH SCIENCES

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

Navi Mumbai-410 209

www.mgmuhs.com

OUTLINE OF COURSE CURRICULUM

B.Sc. (Cardiac Technology)

1. Subject and hours of teaching for Theory and Practical: The number of hours of teaching theory and practical, subject wise in first year, second year and third year are given below.

2. Main and Subsidiary subjects are common in first year for all the B.Sc. courses.

First Year

Main Subjects (First Year)

Paper	Subjects	Teaching hours			University examination Marks(Only Theory)	Internal assessment marks	Total marks
		Theory	Pracs.	Total			
Paper I	Anatomy	35 hrs	25 hrs	60 hrs	80 marks	20 marks	100 marks
Paper II					80 marks ↓	20 marks ↓	100 marks
Section A	Physiology	45 hrs	15 hrs	60 hrs.	40 marks	10 marks	
Section B	Biochemistry	40 hrs	20 hrs	60 hrs.	40 marks	10 marks	
Paper III					80 marks ↓	20 marks ↓	100 marks
Section A	Pathology	42 hrs	18 hrs	60 hrs.	40 marks	10 marks	
Section B	Microbiology	48 hrs	12 hrs	60 hrs	40 marks	10 marks	
Total:-							300 marks

Subsidiary subject(First Year)

Subjects	Teaching hours			University examination Marks	Internal assessment marks	Total marks
	Theory	Pracs	Total			
*English	60 hrs	-	60 hrs	-	-	-

- No Practical examination in any subject in I year.
- The candidates are required to get acquainted with English subject, but there will be no university examination. The colleges are required to conduct examination and maintain records.

Second Year

Main Subjects(Second Year)

Sr. no.	Paper	Subjects	Teaching hours			University examination (Theory)	University examination (Prac.)	Internal assessment marks	Tot mar
			Theory	Pracs	Total				
1	Paper I	Applied Pharmacology	31 hrs	6 hrs	37 hrs	80 marks	-	20(T) marks	100 mar
2	Paper II	Basic Sciences applicable to cardiology: Anatomy, Physiology, Pathology	17 hrs	17 hrs	34 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 mar
3	Paper III	Cardiac Diseases (Principles of Medical & Non Medical Management)	27 hrs	27 hrs	54 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 mar
4	Paper IV	Investigations & Equipments in Cardiology (Invasive & Non Invasive)	25 hrs	45 hrs	70 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 mar
Total:-									550 mar

Subsidiary Subjects(Second Year)

Sr. no.	Subjects	Teaching hours			University examination Marks	Internal assessment marks	Total marks
		Theory	Pracs	Total			
1	*Research & Biostatistics	20	-	20 hrs	-	-	-
2	*Computer application & Database Management	20	-	20 hrs	-	-	-

* Students will undergo clinical posting in relevant department for hands on training and should maintain log book to be certified by the faculty.

* Subsidiary Subjects - University examinations will not be conducted for these subjects.

Third Year

Main Subjects(Third Year)

Sr no.	Paper	Subjects	Teaching hours			University examination (Theory)	University examination (Prac.)	Internal assessment marks	Total marks
			Theory	Pracs	Total				
1	Paper I	Cardiac Technology -Clinical	50 hrs	40 hrs	90 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
2.	Paper II	Cardiac Technology -Applied	50 hrs	40 hrs	90 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
3	Paper III	Cardiac Technology -Advanced	50 hrs	50 hrs	100 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
Total:-									450 marks

First Year Common Syllabus

B.Sc. (Cardiac Technology)

Paper-I
Anatomy

Placement:-First Year

Theory-35 Hours
Practical-25 Hours

Course description

Unit	Syllabus	Lecture (Hrs)	Demo (Hrs)
1	Introduction to Anatomy • Terminology	1	1
2	Skeletal System • Classification of bones • Parts of developing long bone • Classification of joints • Appendicular skeleton • Axial skeleton	 1 1 1 1	 1 1 1 1
3	Muscular system • Types • Muscle groups and movements • Upper limb, lower limb • Neck, back, abdomen	 1 1	 1 1 1
4	Joints • Shoulder • Hip • Knee • Movements and muscle groups producing movements at other joints	 1 1 1 1	 1 1 1 1
5	Respiratory system • Nose • Bronchial tree • Thoracic cage and diaphragm • Lung , Bronchopulmonary segments • Mediastinum	 1 1 1	 1 1 1 1

6	Circulatory system • Types of blood vessels • Heart • Circulation- Systemic and Pulmonary • Major branches from Arch of Aorta • Major Veins	 1 1 1 1	 1 1
7	Digestive system • Mouth, Tongue, • Pharynx, Oesophagus, • Salivary glands • Stomach, Small and Large Intestine • Liver, Spleen, Pancreas, Gall Bladder	 1 1 1 1	 ½ ½ 1 2
8	Excretory system • Kidney, Ureter • Bladder, Urethra • Skin	 1 1 1	 1 1
9	Reproductive system • Male- Testis, Spermatic Cord • Female- Ovaries, FT, Uterus	 1 1	 ½ ½
10	Lymphatic system • Tonsil • Lymph node groups- Cervical, Axillary, Inguinal	 1 1	
11	Endocrine system • Thyroid, Parathyroid • Adrenal, Pitutary	 1 1	
12	Nervous system • Neuron • Parts of nervous system • Brain, spinal cord, brain stem • Cranial and peripheral nerves	 1 1 1	
13	Sensory system • Eye and Ear	 1	
	Total Hours = 60 hrs.	**35 hrs**	**25 hrs**

First Year

Paper-II
Section-A
PHYSIOLOGY

Placement:-First Year

Theory-45 Hours
Practical-15 Hours

Theory:-

Blood:

Composition, properties and functions of Blood.
Haemopoiesis
Haemogram (RBC, WBC, Platelet count, Hb Concentrations)
Blood Groups - ABO and RH grouping
Coagulations & Anticoagulants
Anaemias: Causes, effects & treatment. — 5 Hrs
Body Fluid: Compartments, Composition.
Immunity – Lymphoid tissue

Cardio vascular system

Functions of Cardiovascular System
Structures of CVS & Functions.
Functional Anatomy of Heart & their functions, Cardiac cycle. — 7 Hrs
Junctional tissues of heart & their functions.
Cardiac output
E C G Blood pressure Heart Rate.

Digestive system

Functions of Digestive system.
Functional Anatomy of Digestive System
Composition and functions of all Digestive juices. — 4 Hrs
Movements of Digestive System (Intestine).
Digestion & Absorption of Carbohydrate, Proteins & Fats.

Respiratory System

Functions of Respiratory system
Functional (Physiological) Anatomy of Respiratory System.
Mechanism of respiration. — 5 Hrs
Lung Volumes & capacities.
Transport of Respiratory Gases.

Regulation of Respiration

Nervous system
Functions of Nervous system.
Neuron – Conduction of Impulses, factors affecting. 9 Hrs
Synapse- transmission.
Receptors Reflexes
Ascending tracts
Desending tracts.
Functions of various parts of the Brain.
Cerebro Spinal Fluid (CSF): Composition , functions & Circulation.
Lumbar Puncture.
Autonomic Nervous System (ANS): Functions.

Special senses
Vision. Structure of Eye, functions of different parts.
Refractive errors of Eye and correction.
Visual Pathway.
Colour vision & tests for colour Blindness.
Hearing: Structure and function of ear. 3 Hrs
mechanism of Hearing.
Tests for Hearing (Deafness)

Muscle nerve physiology
Types of Muscle.
Structure of skeletal Muscle, sarcomere.
Neuromuscular junction& Transmission. 3 Hrs
Excitation & contraction coupling(Mechanism of contraction)

SKIN
Structure and function.
Body temperature. 1 Hrs
Fever.
Regulation of Temperature

Excretory System
Excretory organs
Kidneys: Functions.
Nephron, 4 Hrs
Juxta Glomerular Apparatus
Renal circulation.
Mechanism of Urine formation
Mechanism of Urine Formation.
Micturition., Cystomatrogram.
Diuretics.

Artificial Kidney.

Reproductive systems
Structure & Functions of Reproductive system.
Male Reproductive System:spermatogenesis, Testosterone.
Female reproductive system: Ovulation, Menstrual cycle.
Ogenesis, Tests for Ovulation
Oestrogen & Progesterone9
Pregnancy test
Parturition. Contraceptives.
Lactation : Composition of Milk
Advantages of breast Feeding.

4 Hrs

PRACTICALS

15 hours

Study of Microscope and its use Collection of Blood and study of Haemocytometer	1 Hrs
Haemoglobinometry	2 Hrs
White Blood Cell count	2 Hrs
Red Blood Cell count	2 Hrs
Determination of Blood Groups	1 Hrs
Leishman's staining and Differential WBC Count	2 Hrs
Determination of Bleeding Time. Determination of Clotting Time.	1 Hrs
Pulse & Blood Pressure Recording Auscultation for Heart Sounds	2 Hrs
Artificial Respiration –Demonstration Spirometry-Demonstration	2 Hrs

First Year

Paper-II
Section-B

BIOCHEMISTRY

Placement:-First Year

Theory-40 Hours
Practical-20 Hours

No.	Syllabus	Lect. Hrs.
1	Introduction and scope of biochemistry	1
2	**Chemistry of carbohydrates, proteins, lipids and nucleic acid**	
	I)Carbohydrates : Structure, properties, chemical reactions and functions.	2
	Amino acid : Essential and nonessential amino acids with structure and function.	1
	iii) Proteins: Definition, Classification, Structure of Proteins, Denaturation of Proteins, Primary, Secondary Tertiary and Quaternary (overview)	2
	iv) Lipids: Classification and properties. Introduction, Simple Lipids, Compound Lipids, Derived Lipids, Essential Fatty Acids.	2
	v) Nucleic acid : Structure of purine and pyrimidine bases, nucleotides and nucleosides. DNA and RNA : structure and properties.	2
3	Elementary knowledge of enzymes: Classification, mechanism of enzyme action, Enzyme inhibition, enzyme specificity. Role of coenzymes	3
4	Brief concept of biological oxidation: Electron transport chain. inhibitors and uncouplers briefly.	2
5	Outline of digestion, absorption and metabolism of carbohydrate, proteins and fats.	2
	i)Carbohydrate metabolism:-Glycolysis, TCA cycle, Glycogen metabolism Regulation of blood Glucose Concentration, Diabetes Mellitus, Glycosuria.	3
	ii) Proteins: General amino acid reactions. Transamination, decarboxylation, deamination. Urea cycle.	2
	iii) Lipid metabolism: Cholesterol metabolism, Ketone bodies formation and breakdown	2
	iv) Nucleic acid metabolism : Purine catabolism	1

10/35

6	Importance of some minerals- sodium, potassium, calcium, phosphorous, iron, copper, chloride, fluoride.	2
7	Nutritional aspects of carbohydrates, fats, proteins, balanced diet.	1
8	Introduction to medical lab technology: General introduction Role of medical lab technologists, and responsibility, safety measures and first aid. Cleaning and care of general laboratory glassware and equipment. Elementary knowledge of analytical biochemistry. Principles, functions and uses of balances, centrifuge machines, colorimeters.	4
9	Collection and recording of biological specimens, separation of serum plasma preservation and disposal of biological samples/materials.	2
10	Standard solutions: Various std. solutions used , their preparation ; storage of chemicals .	2
11	Units of measurements: S.I units: Definitions, conversions; Measurement of volume : Strength , Normality ,Molarity, Molality Definitions:Mole, molar and normal solutions (preparation, Standardization), pH (Definition ,Pka value, Example, importance of Henderson-Hasselbalch equation); Buffer solutions(Definition, preparation of important solutions), pH indicators (pH papers, universal & other indicators); pH measurement :different methods (pH paper, pH meter, principle of pH meter, structure, working and maintenance.	4
	Practical and demonstration: Cleaning of glassware Preparation of various solutions Maintenance of laboratory, quality control, and first aid Single pan balance, pH- meter Handling of colorimeters Operation and maintenance Distillation of water. Serum electrolytes Na.K.Cl. Demonstration of semi automated / fully automated blood analyzers. Blood gas analyzer, Elisa reader. Demonstration of disposal of laboratory waste product and infected material. Quality Control Five demonstrations on carbohydrate, lipid & Protein metabolism & immunochemistry	20
	Total Theory & Practical hrs.	**60 hrs.**

First Year

Paper-III
Section-A

PATHOLOGY

Placement:-First Year

Theory-42 Hours
Practical-18

Hours

Sr. No.	Topic	No. of lectures	Number of Practical	Total
1	Introduction to Pathology	01	--	01
2	Working and maintenance of instruments	02	03	05
3	General principles of Histopathology techniques collection, fixation, processing & routine staining	05	03	08
4	General principles of Cytopathology techniques collection, fixation, processing & routine staining	05	02	07
5	General principles of Haematology techniques collection, fixation, processing, routine staining, Haemoglobin, TLC, DLC, Peripheral smear, automatic cell counter	05	03	08
6	General principles of Clinical Pathology techniques sample collection, processing for routine test, normal urine & urine examination	05	03	08
7	General principles of Blood Bank techniques antigen, antibody, ABO & Rh system	05	03	08
8	General principles of Autopsy & Museum	02	01	03
9	General Pathology including introduction to inflammation, circulatory disturbances & neoplasia	05	--	05
10	Systemic pathology basis and morphology of common disorders like anemia, leukemia, AIDS, TB, Hepatitis & malaria	05	--	05
11	Maintenance and medico legal importance of records and specimens	02	--	02
	Total	**42 + 18**		**60 hrs**

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First Year

Paper-III
Section-B

Microbiology

Placement:-First Year

Theory-48 Hours
Practical-12 Hours

Unit	Syllabus	Lecture (Hrs)	Demo (Hrs)
1	Concepts and Principles of Microbiology		
	• Historical Perspective, Koch's Postulates	1	
	• Importance of Microbiology	1	
	•Microscopy	1	
	•Classification of Microbes	1	
2	General Characters of Microbes		
	• Morphology, staining methods	1	1
	•Bacterial growth & nutrition	1	
	•Culture media and culture methods +ABS	2	1
	• Collection of specimen, transport and processing		1
	•Antimicrobial mechanism and action	1	
3	Sterilization and Disinfection		
	•Concept of sterilization, Disinfection asepsis	1	
	• Physical methods of Sterilization	1	
	• Chemical methods (Disinfection)	1	1
	• OT Sterlization	1	
	•Biological waste disposal	1	
4	Infection and Infection Control		
	• Infection, Sources, portal of entry and exit	1	
	• Standard (Universal) safety Precautions	1	
	• Hospital acquired infections	1	
	• Hospital Infection control Programme	1	
5	Immunity		
	• Types Classification	1	
	• Antigen, Antibody – Definition and types	1	1
	• Ag-Ab reactions – Types and examples	1	
	• Hypersensitivity - Definition and classification	1	
	• Immunoprophylaris – Types of vaccines, cold chain	1	
	• Immunization Schedule	1	

6	Systemic Bacteriology (Morphology, diseases caused, specimen collection & lists of laboratory tests) • Introduction • Gram Positive Cocci • Gram Negative Cocci • Enterobacteraecea • Imp Gram Negative-Organism • Mycobacteria • Anaerobic bacteria •Spirochaetes • Zoonotic diseases	1 1 1 1 1 1 1 1 1	1 1 1	
7	Mycology •Introduction, Classification, outline of lab diagnosis List of Fungi causing: • Superficial Mycoses • Deep mycoses • opportunistic fungi	1 1 1 1	1	
8	Virology • Introduction, General Properties, outline of lab diagnosis • DNA & RNA Viruses-Classification, diseases caused • HIV Virus • Hepatitis Virus	1 1 1 1	1	
9	Parasitology – morphology, life cycle & outline of lab diagnosis • Introduction, Classification • Protozoa- E. histolytica • Malarial Parasite General properties, classification, list of diseases caused by: • Cestodes and Trematodes • Intestinal Nematodes • Tissue Nematodes • Vectors	1 1 1 1 1 1 1	1 1	
Total:-60 hrs.		**48 hrs**	**12 hrs**

First Year

Subsidiary Subjects

1. ENGLISH

Placement:-First Year

Theory-60 Hours

Course description : The course is designed to enable students to enhance ability to comprehend spoken and written English (and use English) required for effective communication in their professional work. Students will practice their skills in verbal and written English during clinical and classroom experience.

Specific objectives: At the end of the course the students are able to:

1) Develop good vocabulary skills for effective communication.
2) Effectively communicates with patients while rendering care.
3) Understands methods of writing and drafting letters in English.
4) Develop ability to read understand and express meaningfully, the prescribed text.
5) Plans and writes nursing process and records effectively.
6) Develops skills in listening.

Unit	Hours	Theory	Hours	Exercises
I	7 Hrs	☐ Review of Grammer ☐ Remedial study of grammer ☐ Building Vocabulary ☐ Lexical sets	3 Hrs	• Use of Dictionary and Grammer • Practice appropriate words and expression • Revising parts of speech Pairs of confused words, synonyms & Antonyms • Lexical sets &

		Conversational skills (Formal, Neutral & informal situation)		situations, • Practice in public speaking
V	5 Hrs	□ Listening Comprehension Media, audio, video, speeches etc.	2 Hrs	• Listening to audio, video tapes and identify the key points, accent & information pattern.

Bibliography:

1. Living English Grammer & Composition Tickoo M.L. & Subramaniam A. E, Oriental Longman, New Delhi.
2. English for practical purposes Valke, Thorat patil & Merchant, Macmillan Publication, New Delhi.
3. Enriching your competence in English, by Thorat, Valke, Orient Publication, Pune
4. English Grammer & Composition Wren & Martin, S. Chand Publications-2005, Delhi.
5. Selva Rose, Carrier English for Nurses, Ist edition-1999, published by Orient Longman Pvt. Ltd.-1997, Chennai.

Common exam pattern for all 1st year

B.Sc. courses.

Main Subjects:

Paper I: Anatomy

Theory pattern:

Time: Duration: 3hrs.

Total Marks: 80 marks.

Distribution of Marks.

Question type	No. of questions	Questions to be answered	Question X marks	Total marks
Long essays	3	2	2x10	20 marks
Short essays	8	6	6x 5	30 marks
Short answers	12	10	10x 3	30 marks
				Total= 80 marks

Paper II: Physiology (Section A) and Biochemistry (Section B)

Theory pattern:

Time: Duration: 3hrs.

Total Marks: 80marks.(Section A: 40 marks + Section B: 40 marks)

Distribution of marks

Paper II, Section A: Physiology.

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Paper II, Section B: Biochemistry.

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Paper III: Pathology (Section A) and Microbiology(Section B)

Theory pattern.

Time: Duration: 3hrs.

Total Marks: 80 marks: (Section A: 40 marks + Section B: 40 marks)

Distribution of marks

Paper III, Section A: Pathology

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Paper III, Section B: Microbiology

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Second Year

II Year (Cardiac Technology)

Main Subjects

Second Year

Paper – I

Applied Pharmacology

Placement: Second Year

Theory= 31 Hours
Practical=6 Hours

(Mode of action, adverse effects, dose, route of administration and uses of the drugs under the following systems)

1. **General Pharmacology: (2 hrs)**
    a. Pharmacokinetics
    b. Pharmacodynamics

2. **Cardiovascular System: (5 hrs)**
    a. Antianginal
    b. Diuretics
    c. Drugs for CCF
    d. Antihypertensives
    e. Shock

3. **Central Nervous System: (5 hrs)**
    a. Sedatives and Hypnotics
    b. General anaesthetics
    c. Local anaesthetics
    d. NSAIDS
    e. Opioids

4. **Endocrine System: (3 hrs)**
    a. Insulin and Oral Hypoglycemic agents
    b. Corticosteriods

5. **Chemotherapy : (5 hrs)**
    a. Penicillins
    b. Cephalosporins
    c. Aminoglycosides
    d. Tertracycline
    e. Chloramphenicol
    f. Antitubercular agents

6. **Respiratory System: (2 hrs)**
    a. Mucokinetics & Mucolytics
    b. Antiasthmatic agents

7. **Gastrointestinal System (2 hrs)**
    a. Drugs for peptic ulcer
    b. Antiemetics

8. **Blood : (2 hrs)**
    a. Anticoagulants
    b. Thrombolytics
    c. Antiplatelet

9. **Miscellaneous: (5 hrs)**
    a. Neuromuscular blockers
    b. Antihistaminics
    c. IV fluids
    d. Electrolyte supplements
    e. Cardioplegic drugs
    f. New drugs in Perfusion Technology

Practicals: (6 hrs)

- Experimental Pharmacology
- Prescription Writing
- Different formulations
- Routes of Drug Administration-Oral
- Routes of Drug Administration-Parenteral
- Routes of Drug Administration-Topical

Paper II

Basic Sciences applicable to cardiology:

Anatomy, Physiology, Pathology

Placement: Second Year

Theory=17 Hours
Practical=17 Hours

Sr. No	Topics / Syllabus	Theory	Demo/ Practicals
1	Introduction to paramedical Training in cardiology	2	2
2	Anatomy of Heart , general , Valves ,coronary , anatomy of conduction system.	3	3
3	Function of heart, Cardiac cycle , Perfusion , haemodynamics .	3	3
4	Circulatory system Systemic arterial and venous Pulmonary	2	2
5	Pathophysiology in common heart diseases	5	5
6	Physical examination of cardiovascular system	2	2
Total Hrs=34 hrs		**17 hrs**	**17 hrs**

Second Year

Paper III

Cardiac Diseases

(Principles of Medical & Non Medical Management)

Placement: Second Year

Theory=27 Hours
Practical=27 Hours

Sr. No.	Topics / Syllabus	Theory	Demo/ Practical
1	General principles of patient care in ward and intensive cardiac units	2	2
2	Diagnosis in cardiology general principles	4	4
3	Classification of Rheumatic heart disease , congenital and coronary artery disease.	5	5
4	Principles and management of Common Heart Disease	5	5
5	Cardiology ward documentation and procedures	2	2
6	Patient education and Rehabilitation in Cardiology	2	2
7	Cardiology Prescriptions General Principles	5	5
8	Cardiopulmonary Resuscitation	4	4
Total Hrs.=54 hrs		**27 hrs**	**27 hrs**

Second Year

Paper – IV

Investigations & Equipments in Cardiology(Invasive & Non Invasive)

Placement: Second Year

Theory=25 Hours
Practical=45 Hours

Sr. No.	Topics / Syllabus	Theory	Demo/ Practical
1	Electrocardiography	4	4
2	Stress testing	4	4
3	Echocardiography	4	8
4	Radiology of heart and Blood vessels Cardiac CT, Cardiac MRI, CT/ MR angiography	4	8
5	Nuclear Cardiology	3	3
6	Defibrillator	1	2
7	Holter Monitoring	1	2
8	Endotracheal Intub	1	10
9	Ext Pacemaker	1	2
10	ACT/ABG	1+1	2
Total hrs =70 hrs		**25 hrs**	**45 hrs**

Subsidiary Subjects

1. RESEARCH AND BIO STATISTICS

Placement: Second Year Theory= 20 Hours

Course Description:

Introduction to basic statistical concepts: methods of statistical analysis; and
Interpretation of data
Behavioural Objectives:
Understands Statistical terms.
Possesses knowledge and skill in the use of basic statistical and research methodology.

Unit- I: Introduction
Meaning, definition, characteristics of statistics.
Importance of the study of statistics.
Branches of statistics.
Statistics and health science including nursing. 2 hrs
Parameters and estimates.
Descriptive and inferential statistics.
Variables and their types.
Measurement scales.

Unit- II: Tabulation of Data
Raw data, the array, frequency distribution.
Stem-leaf display 2 hrs
Basics principles of graphical representation.
Types of diagrams- histograms, frequency polygons, smooth frequency polygon, commulative frequency curve, ogive.

Unit- III: Measure of Central Tendency
Need for measures of central tendency
Definition and calculation of mean- ungrouped and grouped.
Trimmed mean
Meaning, interpretation and calculation of median ungrouped and grouped.
Meaning and calculation of median ungrouped and grouped. 4 hrs.

Meaning and calculation of mode.
Comparison of the mean, mode & median.
Guidelines for the use of various measures of central tendency.

Unit- IV: Measure of Variability
Need for measure of dispression.
The range, the average deviation. 4 hrs
The variance and standard deviation.
Calculation of variance and standard deviation ungrouped and grouped.
Properties and uses of variance and SD

Unit- V: Measures of Skewness & Kurtosis
Needs for measure of skewness & Kurtosis
Karl pearson's co-efficient of skewness 1 hrs
Types of Kurtosis

Unit- VI: Samling Techniques
Need for sampling-Criteria for good samples
Application of sampling in Community. 6 hrs
Procedures of sampling and sampling designs errors.
The normal distribution.
Sampling variation and tests of significance.
Student's t-test, chi-square test, z-test.

Unit- VII: Health Indicator
Importance of health Indicator
Indicators of population, morbidity, mortality, health services. 1 hrs
Calculation of rates, and rations of health.

Recommended Books
B.K. Mahajan & M. Gupta (1995) Text Book of Preventive & Social Medicine, 2002, 17th Edition Jaypee Brothers.

2. Computer Application & Database Management

Placement: Second Year Theory= 20 Hours

The course enables the students to understand the fundamentals of computer and its applications.

Introduction to data processing:
Features of computers, Advantages of using computers. Getting data into/out of computers. Role of computers. What is Data processing? Application areas of computers involved in Data processing. Common activities in processing. Types of Data processing. Characteristics of information. What are Hardware and software?

Hardware Concepts:
Architecture of computers, Classification of computers, Concept of Damage. Types of storage devices. Characteristics of disks, tapes, Terminals, Printers, Network. Applications of networking concepts of PC System care, floppy care, Data care.
Concept of software.

Classification of software: System software. Application of software. Operating system.
Computer system: Computer Virus. Precaution against viruses. Dealing with viruses.
Computers in Medical electronics.
Basic Anatomy of Computers.
Principles of programming.
Computer application- principles in scientific research; work processing, medicine, libraries, museum, education, information system.
Data Processing
Computer in physical therapy- principles in EMG, Exercise testing equipment, Laser.

III Year B.Sc. (Cardiac Technology)

Main Subjects

Paper I

Cardiac Technology-Clinical

Placement: Third Year

Theory=50 Hours
Practical=40Hours

1. Interpretation of Normal ECG and Basic abnormalities of ECG in RHD, IHD & CHD
2. Echo in rheumatic heart disease –Echo in mitral stenosis, mitral incompetence, aortic stenosis, aortic incompetence, pulmonary hypertension. Post AVR, Post MVR. Prosthetic valve malfunction, LA clot.
3. Echo in congenital heart disease-Echo in ASD, VSD, PDA pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF. Dextrocardia.
4. Echo in ischemic heart disease-Echo in acute myocardial infarction, old myocardial infarction and other ischemic heart disease related conditions, LV aneurysm.
5. Echo in other cardiovascular disease- Echo in various types of cardio myopathy infective endocardities diseases of aorta, mitral valve prolapsed, myxoma and other cardio vascular diseases.
6. Assessment of Cardiac function- measurements of all cardiac chambers and assessment of cardiac function.
7. Echo in pericardial disease- Pericardial effusion, cardiac temponade, constructive pericarditis.
8. Cardiac catheterization laboratory- general details of cardiac catheterization equipments, how to handle the machine, common problems one may come across and how to over come it, radiation
   Hazards
9. Materials used in the cathlab-all catheters, balloons, guidewires, pacemakers contrast material and other material used in the cardiac catheterization laboratory an sterilization of all these materials.
10. Right heart catheterization- procedure, cath position, oxymetry at various-levels, angios done and its interpretation.
11. Left heart catheterization- procedure, cath position, oxymetry at various levels, angios done and its interpretation.
12. Coronary angiogram- procedure, materials used, type and amount dye used, indications and contraindications, various pictures recorded in various angles and gross interpretation.
13. Peripheral angiogram- procedure, indication and contraindication.

Paper II

Cardiac Technology-Applied

Placement: Third Year

Theory=50 Hours
Practical=40 Hours

1. ECG in myocardial infarction- definition of myocardial infraction, diagnosis of myocardial infraction, ECG criteria for myocardial infraction, ECG in anterior wall, inferior wall, true posterior wall and sub endocardial infraction and RV infarction
2. ECG in rheumatic heart disease- definition of rheumatic heart disease, valvular involvement in rheumatic heart disease, ECG in mitral stenosis, mitral incompetence, aortic stenosis and aortic incompetenance.
3. ECG in hypertension-definition of hypertension, how to record blood pressure, ECG in hypertension.
4. ECG in congenital heart disease-common congenital heart disease ASD,VSD, PDA, pulmonary stenosis, aortic stenosis, coarctation of aorta, TOF, definition of all these conditions, ECG changes in all these conditions.
5. ECG in other conditions- ECG in various types of cardiomyopathy, myxoedema, pericardial effusion, acute pericardities and other vascular diseases. Bundle branch block, WPW syndrome, dextrocardia.
6. Trans esophageal echocardiogram-indications, procedure, usefulness and complications one may encounter and its management.
7. Stress Echo-procedure and indications.
8. Peripheral Doppler – Procedure and usefulness of peripheral Doppler.
9. Coronary angioplasty- procedure, material used, complication one may encounter and how to manage it.
10. Peripheral angioplasty- materials used and procedure. Angioplasty of coarctation of aorta.
11. Fetal echocardiogram- Procedure, basic interpretation.
12. Contrast echocardiogram- procedure and usefulness of contrast echocardiogram.
13. Myocardial contrast echo. Basic knowledge.

Paper III

Cardiac Technology-Advanced

Placement: Third Year

Theory=50 Hours
Practical=50 Hours

1- Cardiac monitoring- definition, purpose of cardiac monitoring.

How to recognize various arrhythmias how to set up a intensive coronary care unit and usefulness of ICCU.

2. Interpretation of TMT, report-criteria for TMT positive test contraindication for TMT conditions where TMT is not useful, complications that may occur in TMT room and its management.

3. Use of defibrillator-indications, how to use the defibrillator, complications during the procedure and its management.

4. Management of Cardiac arrest- definition causes external cardiac massage, artificial respiration and other drugs and procedures used in the management of Cardiac arrest.

5. Myocardial perfusion scan- procedures and usefullness of myocardial perfusion scan.

6. Cardiac arrhythmias- bradyarrhythmia and tachy arrhythmias and ECG diagnosis of all rhythm disturbances. Sinus arrhythmia, APC, FPC, VPC, VF, VT, AF, SVT, I0HB, II0HB, complete heart block

7. Electrolyte disturbances- ECG in hypokelemia, hyperkelemia etc.

8. Holter Monitoring- procedure and usefullness.

9. Valvoplasties- procedure, indication, complications and treatment of ballons, mitral valvuloplasty, ballon aortic valvuloplasty ballon pulmonary valvuloplasty and balloon tricuspid valvuloplasty.

10. Coil closure and device closure of PDA- procedure, indications and materials used for coil and device closure of PDA.

11. Device closure of ASD- procedure indications and materials used for device closure of ASD.

12. Device closure of VSD- procedure, indications and materials used for device closure of VSD.

13. Electrophysiological Studies- basic knowledge of EP studies mapping and ablation.

14. Oxymetry -handling of the instrument-and usefulness of the instrument, normal and abnormal values.

15. Pressure recording-handling of the instrument and pressures in various chambers, normal and abnormal values.

16. Temporary and permanent pacing – materials used, procedure, complications one may encounter and management. Implantable Cardioverter defibrillator devices.

17. CD recording and storage- recording and storage of all the procedures over CD.

18. Procedure during pregnancy- precautions to be followed.

19. Nuclear Cardiology- Instrumentation, radiopharmaceuticals patient imaging techniques.

Exam Pattern.

1. **Internal Exams: TWO in number.**

Theory exam

Exam	Time to conduct internal exams	Theory Marks	Practical Marks
1.Mid Term Exam	After 6 month from starting the course	40	20
2.Pre final Exam	Atleast 1 month prior to final university exam.	80	40
Total		**120**	**60**
Internal Assessment (to be scaled down from total of the two exams)		**Out of 20**	**Out of 10**

2. **University Exam: (exam at the end of each year)**

Final marks distribution

University Exam	Theory	Practical
University exam	80	40 (30Pra+10Viva)
Internal Assessment	20	10
Total Marks	**100**	**50**

Exam paper pattern Theory (Prefinal Exam)

Question type	No. of questions	Questions to be answered	Question X marks	Total marks
Long essays	3	2	2x10	**20 marks**
Short essays	8	6	6x 5	**30 marks**
Short answers	12	10	10x 3	**30 marks**
				Total= 80 marks

24/3.5

Exam paper pattern Theory (Midterm Exam)

Question type	No. of questions	Questions to be answered	Question X marks	Total marks
Long essays	2	1	1x10	10 marks
Short essays	4	3	3x 5	15 marks
Short answers	6	5	5x 3	15 marks
				Total= 40 marks

Heads for passing:-

1. Minimum 40% in the University paper of 80 marks and minimum 50% in the total 100 marks(80 + 20 IA)
2. 75%: (out of 100 marks): Distinction.
3. 60%: out of 100 marks): First class.
4. 50% (out of 100 marks): Pass class

   A student can carry a backlog of 2 subjects in the first year but should pass the subjects in the next supplementary exam. In the second and third year, a backlog of only one subject is permitted.

MGM INSTITUTE OF HEALTH SCIENCES

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

Grade 'A' Accredited by NAAC

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Syllabus for

B.Sc.

(Cardiac Technology)

(Approved as per BOM-35/2014, Resolution No. 4.6(f), dated 26/04/2014)

(Approved BOM 35/2014, Resolution No 4.6 (f), Dated 26/04/2014)

OUTLINE OF COURSE CURRICULUM

B.Sc. (Cardiac Technology)

1. Subject and hours of teaching for Theory and Practical: The number of hours of teaching theory and practical, subject wise in first year, second year and third year are given below.

2. Main and Subsidiary subjects are common in first year for all the B.Sc. courses.

First Year

Main Subjects (First Year)

Sr no.	Paper	Subjects	Teaching hours			University examination Marks(Only Theory)	Internal assessment marks	Total marks
			Theory	Pracs.	Total			
1	Paper I	Anatomy	35 hrs	25 hrs	60 hrs	80 marks	20 marks	100 marks
2.	Paper II					80 marks ↓	20 marks ↓	100 marks
	Section A	Physiology	45 hrs	15 hrs	60 hrs.	40 marks	10 marks	
	Section B	Biochemistry	40 hrs	20 hrs	60 hrs.	40 marks	10 marks	
3	Paper III					80 marks ↓	20 marks ↓	100 marks
	Section A	Pathology	42 hrs	18 hrs	60 hrs.	40 marks	10 marks	
	Section B	Microbiology	48 hrs	12 hrs	60 hrs	40 marks	10 marks	
Total:-								300 marks

Subsidiary subject(First Year)

Sr no.	Subjects	Teaching hours			University examination Marks	Internal assessment marks	Total marks
		Theory	Pracs	Total			
1	*English	60 hrs	-	60 hrs	-	-	-

- No Practical examination in any subject in I year.
- The candidates are required to get acquainted with English subject, but there will be no university examination. The colleges are required to conduct examination and maintain records.

Second Year

Sr. no.	Paper	Subjects	Teaching hours			University examination (Theory)	University examination (Prac.)	Internal assessment marks	Total marks
			Theory	Pracs	Total				
1	Paper I	Applied Pharmacology	31 hrs	6 hrs	37 hrs	80 marks	-	20(T) marks	100 marks
2	Paper II	Basic Sciences applicable to cardiology: Anatomy, Physiology, Pathology	17 hrs	17 hrs	34 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
3	Paper III	Cardiac Diseases (Principles of Medical & Non Medical Management)	27 hrs	27 hrs	54 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
4	Paper IV	Investigations & Equipments in Cardiology (Invasive & Non Invasive)	25 hrs	45 hrs	70 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
		Total:-							550 marks

Main Subjects(Second Year)

Subsidiary Subjects(Second Year)

Sr. no.	Subjects	Teaching hours			University examination Marks	Internal assessment marks	Total marks
		Theory	Pracs	Total			
1	*Research & Biostatistics	20	-	20 hrs	-	-	-
2	*Computer application & Database Management	20	-	20 hrs	-	-	-

* Students will undergo clinical posting in relevant department for hands on training and should maintain log book to be certified by the faculty.

* Subsidiary Subjects - University examinations will not be conducted for these subjects.

Third Year

Main Subjects(Third Year)

Paper	Subjects	Teaching hours			University examination (Theory)	University examination (Prac.)	Internal assessment marks	Total marks
		Theory	Pracs	Total				
Paper I	Cardiac Technology -Clinical	50 hrs	40 hrs	90 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
Paper II	Cardiac Technology -Applied	50 hrs	40 hrs	90 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
Paper III	Cardiac Technology -Advanced	50 hrs	50 hrs	100 hrs	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
Total:-								450 marks

First Year Common Syllabus

B.Sc. (Cardiac Technology)

Paper-I
Anatomy

Placement:-First Year

Course description

Theory-35 Hours
Practical-25 Hours

Unit	Syllabus	Lecture (Hrs)	Demo (Hrs)
1	Introduction to Anatomy • Terminology	1	1
2	Skeletal System • Classification of bones • Parts of developing long bone • Classification of joints • Appendicular skeleton • Axial skeleton	1 1 1 1	1 1 1 1
3	Muscular system • Types • Muscle groups and movements • Upper limb, lower limb • Neck, back, abdomen	1 1	1 1 1
4	Joints • Shoulder • Hip • Knee • Movements and muscle groups producing movements at other joints	1 1 1 1	1 1 1 1
5	Respiratory system • Nose • Bronchial tree • Thoracic cage and diaphragm • Lung , Bronchopulmonary segments • Mediastinum	1 1 1	1 1 1 1
6	Circulatory system • Types of blood vessels • Heart • Circulation- Systemic and Pulmonary • Major branches from Arch of Aorta	1 1 1 1	1 1

	• Major Veins		
7	Digestive system • Mouth, Tongue, • Pharynx, Oesophagus, • Salivary glands • Stomach, Small and Large Intestine • Liver, Spleen, Pancreas, Gall Bladder	 1 1 1 1	 ½ ½ 1 2
8	Excretory system • Kidney, Ureter • Bladder, Urethra • Skin	 1 1 1	 1 1
9	Reproductive system • Male- Testis, Spermatic Cord • Female- Ovaries, FT, Uterus	 1 1	 ½ ½
10	Lymphatic system • Tonsil • Lymph node groups- Cervical, Axillary, Inguinal	 1 1	
11	Endocrine system • Thyroid, Parathyroid • Adrenal, Pitutary	 1 1	
12	Nervous system • Neuron • Parts of nervous system • Brain, spinal cord, brain stem • Cranial and peripheral nerves	 1 1 1	
13	Sensory system • Eye and Ear	 1	
	Total Hours = 60 hrs.	**35 hrs**	**25 hrs**

First Year

Paper-II
Section-A
PHYSIOLOGY

Placement:-First Year

Theory-45 Hours
Practical-15 Hours

Theory:-

Blood:

Composition, properties and functions of Blood.
Haemopoiesis
Haemogram (RBC, WBC, Platelet count, Hb Concentrations)
Blood Groups - ABO and RH grouping
Coagulations & Anticoagulants
Anaemias: Causes, effects & treatment. — 5 Hrs
Body Fluid: Compartments, Composition.
Immunity – Lymphoid tissue

Cardio vascular system

Functions of Cardiovascular System
Structures of CVS & Functions.
Functional Anatomy of Heart & their functions, Cardiac cycle. — 7 Hrs
Junctional tissues of heart & their functions.
Cardiac output
E C G Blood pressure Heart Rate.

Digestive system

Functions of Digestive system.
Functional Anatomy of Digestive System
Composition and functions of all Digestive juices. — 4 Hrs
Movements of Digestive System (Intestine).
Digestion & Absorption of Carbohydrate, Proteins & Fats.

Respiratory System

Functions of Respiratory system
Functional (Physiological) Anatomy of Respiratory System.
Mechanism of respiration.
Lung Volumes & capacities. — 5 Hrs
Transport of Respiratory Gases.
Regulation of Respiration

Nervous system
Functions of Nervous system.
Neuron – Conduction of Impulses, factors affecting. 9 Hrs
Synapse- transmission.
Receptors Reflexes
Ascending tracts
Desending tracts.
Functions of various parts of the Brain.
Cerebro Spinal Fluid (CSF): Composition , functions & Circulation.
Lumbar Puncture.
Autonomic Nervous System (ANS): Functions.

Special senses
Vision. Structure of Eye, functions of different parts.
Refractive errors of Eye and correction.
Visual Pathway.
Colour vision & tests for colour Blindness.
Hearing: Structure and function of ear. 3 Hrs
mechanism of Hearing.
Tests for Hearing (Deafness)

Muscle nerve physiology
Types of Muscle.
Structure of skeletal Muscle, sarcomere.
Neuromuscular junction& Transmission. 3 Hrs
Excitation & contraction coupling(Mechanism of contraction)

SKIN
Structure and function.
Body temperature.
Fever. 1 Hrs
Regulation of Temperature

Excretory System
Excretory organs
Kidneys: Functions.
Nephron,
Juxta Glomerular Apparatus 4 Hrs
Renal circulation.
Mechanism of Urine formation
Mechanism of Urine Formation.
Micturition., Cystomatrogram.
Diuretics.
Artificial Kidney.

Reproductive systems

Structure & Functions of Reproductive system.
Male Reproductive System:spermatogenesis, Testosterone.
Female reproductive system: Ovulation, Menstrual cycle.
Ogenesis, Tests for Ovulation
Oestrogen & Progesterone9
Pregnancy test — 4 Hrs
Parturition. Contraceptives.
Lactation : Composition of Milk
Advantages of breast Feeding.

PRACTICALS

Study of Microscope and its use	15 hours
Collection of Blood and study of Haemocytometer	1 Hrs
Haemoglobinometry	2 Hrs
White Blood Cell count	2 Hrs
Red Blood Cell count	2 Hrs
Determination of Blood Groups	1 Hrs
Leishman's staining and Differential WBC Count	2 Hrs
Determination of Bleeding Time. { Determination of Clotting Time.	1 Hrs
Pulse & Blood Pressure Recording Auscultation for Heart Sounds	2 Hrs
Artificial Respiration –Demonstration Spirometry-Demonstration	2 Hrs

First Year

Paper-II
Section-B

BIOCHEMISTRY

Placement:-First Year

Theory-40 Hours
Practical-20 Hours

No.	Syllabus	Lect. Hrs.
1	Introduction and scope of biochemistry	1
2	**Chemistry of carbohydrates, proteins, lipids and nucleic acid** I)Carbohydrates : Structure, properties, chemical reactions and functions. Amino acid : Essential and nonessential amino acids with structure and function. iii) Proteins: Definition, Classification, Structure of Proteins, Denaturation of Proteins, Primary, Secondary Tertiary and Quaternary (overview) iv) Lipids: Classification and properties. Introduction, Simple Lipids, Compound Lipids, Derived Lipids, Essential Fatty Acids. v) Nucleic acid : Structure of purine and pyrimidine bases, nucleotides and nucleosides. DNA and RNA : structure and properties.	2 1 2 2
3	Elementary knowledge of enzymes: Classification, mechanism of enzyme action, Enzyme inhibition, enzyme specificity. Role of coenzymes	3
4	Brief concept of biological oxidation: Electron transport chain. inhibitors and uncouplers briefly.	2
5	Outline of digestion, absorption and metabolism of carbohydrate, proteins and fats. i)Carbohydrate metabolism:-Glycolysis, TCA cycle, Glycogen metabolism Regulation of blood Glucose Concentration, Diabetes Mellitus, Glycosuria. ii) Proteins: General amino acid reactions. Transamination, decarboxylation, deamination. Urea cycle. iii) Lipid metabolism: Cholesterol metabolism, Ketone bodies formation and breakdown iv) Nucleic acid metabolism : Purine catabolism	2 3 2 2 1
6	Importance of some minerals- sodium, potassium, calcium, phosphorous, iron, copper, chloride, fluoride.	2

7	Nutritional aspects of carbohydrates, fats, proteins, balanced diet.	1
8	Introduction to medical lab technology: General introduction Role of medical lab technologists, and responsibility, safety measures and first aid. Cleaning and care of general laboratory glassware and equipment. Elementary knowledge of analytical biochemistry. Principles, functions and uses of balances, centrifuge machines, colorimeters.	4
9	Collection and recording of biological specimens, separation of serum plasma preservation and disposal of biological samples/materials.	2
10	Standard solutions: Various std. solutions used , their preparation ; storage of chemicals .	2
11	Units of measurements: S.I units: Definitions, conversions; Measurement of volume : Strength , Normality ,Molarity, Molality Definitions:Mole, molar and normal solutions (preparation, Standardization), pH (Definition ,Pka value, Example, importance of Henderson-Hasselbalch equation); Buffer solutions(Definition, preparation of important solutions), pH indicators (pH papers, universal & other indicators); pH measurement :different methods (pH paper, pH meter, principle of pH meter, structure, working and maintenance.	4
	Practical and demonstration: Cleaning of glassware Preparation of various solutions Maintenance of laboratory, quality control, and first aid Single pan balance, pH- meter Handling of colorimeters Operation and maintenance Distillation of water. Serum electrolytes Na.K.Cl. Demonstration of semi automated / fully automated blood analyzers. Blood gas analyzer, Elisa reader. Demonstration of disposal of laboratory waste product and infected material. Quality Control Five demonstrations on carbohydrate, lipid & Protein metabolism & immunochemistry	20
	Total Theory & Practical hrs.	**60 hrs.**

First Year

Paper-III
Section-A

PATHOLOGY

Placement:-First Year

Theory-42 Hours
Practical-18

Hours

Sr. No.	Topic	No. of lectures	Number of Practical	Total
1	Introduction to Pathology	01	--	01
2	Working and maintenance of instruments	02	03	05
3	General principles of Histopathology techniques collection, fixation, processing & routine staining	05	03	08
4	General principles of Cytopathology techniques collection, fixation, processing & routine staining	05	02	07
5	General principles of Haematology techniques collection, fixation, processing, routine staining, Haemoglobin, TLC, DLC, Peripheral smear, automatic cell counter	05	03	08
6	General principles of Clinical Pathology techniques sample collection, processing for routine test, normal urine & urine examination	05	03	08
7	General principles of Blood Bank techniques antigen, antibody, ABO & Rh system	05	03	08
8	General principles of Autopsy & Museum	02	01	03
9	General Pathology including introduction to inflammation, circulatory disturbances & neoplasia	05	--	05
10	Systemic pathology basis and morphology of common disorders like anemia, leukemia, AIDS, TB, Hepatitis & malaria	05	--	05
11	Maintenance and medico legal importance of records and specimens	02	--	02
	Total	**42 + 18**		**60 hrs**

First Year

Paper-III
Section-B

Microbiology

Placement:-First Year

Theory-48 Hours
Practical-12 Hours

Unit	Syllabus	Lecture (Hrs)	Demo (Hrs)
1	Concepts and Principles of Microbiology		
	• Historical Perspective, Koch's Postulates	1	
	• Importance of Microbiology	1	
	•Microscopy	1	
	•Classification of Microbes	1	
2	General Characters of Microbes		
	• Morphology, staining methods	1	1
	•Bacterial growth & nutrition	1	
	•Culture media and culture methods +ABS	2	1
	• Collection of specimen, transport and processing		1
	•Antimicrobial mechanism and action	1	
3	Sterilization and Disinfection		
	•Concept of sterilization, Disinfection asepsis	1	
	• Physical methods of Sterilization	1	
	• Chemical methods (Disinfection)	1	1
	• OT Sterlization	1	
	•Biological waste disposal	1	
4	Infection and Infection Control		
	• Infection, Sources, portal of entry and exit	1	
	• Standard (Universal) safety Precautions	1	
	• Hospital acquired infections	1	
	• Hospital Infection control Programme	1	
5	Immunity		
	• Types Classification	1	
	• Antigen, Antibody – Definition and types	1	1
	• Ag-Ab reactions – Types and examples	1	
	• Hypersensitivity - Definition and classification	1	
	• Immunoprophylaris – Types of vaccines, cold chain	1	
	• Immunization Schedule	1	

6	Systemic Bacteriology (Morphology, diseases caused, specimen collection & lists of laboratory tests) • Introduction • Gram Positive Cocci • Gram Negative Cocci • Enterobacteraecea • Imp Gram Negative-Organism • Mycobacteria • Anaerobic bacteria •Spirochaetes • Zoonotic diseases	1 1 1 1 1 1 1 1 1 1	 1 1 1
7	Mycology •Introduction, Classification, outline of lab diagnosis List of Fungi causing: • Superficial Mycoses • Deep mycoses • opportunistic fungi	1 1 1 1	1
8	Virology • Introduction, General Properties, outline of lab diagnosis • DNA & RNA Viruses-Classification, diseases caused • HIV Virus • Hepatitis Virus	1 1 1 1	1
9	Parasitology – morphology, life cycle & outline of lab diagnosis • Introduction, Classification • Protozoa- E. histolytica • Malarial Parasite General properties, classification, list of diseases caused by: • Cestodes and Trematodes • Intestinal Nematodes • Tissue Nematodes • Vectors	1 1 1 1 1 1 1	1 1
	Total:-60 hrs.	**48 hrs**	**12 hrs**

First Year

Subsidiary Subjects

1. ENGLISH

Placement:-First Year

Theory-60 Hours

Course description : The course is designed to enable students to enhance ability to comprehend spoken and written English (and use English) required for effective communication in their professional work. Students will practice their skills in verbal and written English during clinical and classroom experience.

Specific objectives: At the end of the course the students are able to:

1) Develop good vocabulary skills for effective communication.
2) Effectively communicates with patients while rendering care.
3) Understands methods of writing and drafting letters in English.
4) Develop ability to read understand and express meaningfully, the prescribed text.
5) Plans and writes nursing process and records effectively.
6) Develops skills in listening.

Unit	Hours	Theory	Hours	Exercises
I	7 Hrs	☐ Review of Grammer ☐ Remedial study of grammer ☐ Building Vocabulary ☐ Lexical sets	3 Hrs	• Use of Dictionary and Grammer • Practice appropriate words and expression • Revising parts of speech Pairs of confused words, synonyms & Antonyms • Lexical sets &

				collocations • Using appropriate words and expressions.
II	20 Hrs	☐ Read and comprehend prescribed course books ☐ Skimming & Scanning ☐ Reading in sense groups ☐ Reading between the lines	07 Hrs	• Reading • Summarizing • Comprehension
III	5 Hrs	☐ Various forms of composition Letter writing ☐ Note making & Note takings ☐ Precis writings ☐ Anecdotal records ☐ Diary writing ☐ Reports on health problem ☐ Resume/CV ☐ Notices, Agenda,minutes ☐ Telegram ☐ Essay	5 Hrs	• Letter writing • Note making & Note takings • Precis writings • Anecdotal records • Diary writing • Reports on health problem • Resume/CV • Notices, Agenda, minutes, telegram, essay • Discussion on written reports/documents
IV	3 Hrs	☐ Spoken English Phonetics, Public speaking ☐ Oral report ☐ Group Discussion Debate ☐ Telephonic Conversation	3 Hrs	• Debate • Participating in Seminar, Panel discussion, Symposium • Telephonic Conversion Conversation in different

		Conversational skills (Formal, Neutral & informal situation)		situations, • Practice in public speaking
V	5 Hrs	□ Listening Comprehension Media, audio, video, speeches etc.	2 Hrs	• Listening to audio, video tapes and identify the key points, accent & information pattern.

Bibliography:

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2. English for practical purposes Valke, Thorat patil & Merchant, Macmillan Publication, New Delhi.
3. Enriching your competence in English, by Thorat, Valke, Orient Publication, Pune
4. English Grammer & Composition Wren & Martin, S. Chand Publications-2005, Delhi.
5. Selva Rose, Carrier English for Nurses, Ist edition-1999, published by Orient Longman Pvt. Ltd.-1997, Chennai.

Common exam pattern for all 1st year B.Sc. courses.

Main Subjects:

Paper I: Anatomy

Theory pattern:

Time: Duration: 3hrs.

Total Marks: 80 marks.

Distribution of Marks.

Question type	No. of questions	Questions to be answered	Question X marks	Total marks
Long essays	3	2	2x10	20 marks
Short essays	8	6	6x 5	30 marks
Short answers	12	10	10x 3	30 marks
				Total= 80 marks

Paper II: Physiology (Section A) and Biochemistry (Section B)

Theory pattern:

Time: Duration: 3hrs.

Total Marks: 80marks.(Section A: 40 marks + Section B: 40 marks)

Distribution of marks

Paper II, Section A: Physiology.

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Paper II, Section B: Biochemistry.

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Paper III: Pathology (Section A) and Microbiology(Section B)

Theory pattern.

Time: Duration: 3hrs.

Total Marks: 80 marks: (Section A: 40 marks + Section B: 40 marks)

Distribution of marks

Paper III, Section A: Pathology

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Paper III, Section B: Microbiology

Question type	No. of questions	Questions to be answered	Question X marks	Marks
Long essays	2	1	1x10	10 marks
Short essays	5	3	3 x 5	15 marks
Short answers	7	5	5x 3	15 marks
				Total= 40 marks

Second Year

II Year (Cardiac Technology)

Main Subjects

Paper – I

Applied Pharmacology

Placement: Second Year

Theory= 31 Hours
Practical=6 Hours

(Mode of action, adverse effects, dose, route of administration and uses of the drugs under the following systems)

1. **General Pharmacology: (2 hrs)**
   a. Pharmacokinetics
   b. Pharmacodynamics

2. **Cardiovascular System: (5 hrs)**
   a. Antianginal
   b. Diuretics
   c. Drugs for CCF
   d. Antihypertensives
   e. Shock

3. **Central Nervous System: (5 hrs)**
   a. Local anaesthetics

4. **Chemotherapy : (5 hrs)**
   a. Penicillins
   b. Cephalosporins
   c. Aminoglycosides

5. **Respiratory System: (2 hrs)**
    a. Antiasthmatic agents

6. **Blood : (2 hrs)**
    a. Anticoagulants
    b. Thrombolytics
    c. Antiplatelet

7. **Miscellaneous: (5 hrs)**
    a. Neuromuscular blockers
    b. IV fluids
    c. Electrolyte supplements
    d. Cardioplegic drugs

Practicals: (6 hrs)

- Experimental Pharmacology
- Prescription Writing
- Different formulations
- Routes of Drug Administration-Oral
- Routes of Drug Administration-Parenteral
- Routes of Drug Administration-Topical

Paper II

Basic Sciences applicable to cardiology:

Anatomy, Physiology related to cardiology

Placement: Second Year

Theory=17 Hours
Practical=17 Hours

Sr. No	Topics / Syllabus	Theory	Demo/ Practicals
1	Introduction to paramedical Training in cardiology	2	2
2	Anatomy of Heart, general, Valves, coronary, anatomy of conduction system.	3	3
3	Function of heart, Cardiac cycle, Perfusion, hemodynamics.	3	3
4	Circulatory system Systemic arterial and venous Pulmonary	2	2
5	Pathophysiology in common heart diseases	5	5
6	Physical examination of cardiovascular system	2	2
Total Hrs=34 hrs		**17 hrs**	**17 hrs**

Second Year

Paper III

Cardiac Diseases

(Principles of Medical & Non Medical Management)

Placement: Second Year

Theory=24 Hours
Practical=24 Hours

Sr. No.	Topics / Syllabus	Theory	Demo/ Practical
1	General principles of patient care in ward and intensive cardiac units	2	2
2	Diagnosis in cardiology general principles	4	4
3	Classification of Rheumatic heart disease , congenital and coronary artery disease.	5	5
4	Principles and management of Common Heart Disease	5	5
5	Cardiology ward documentation and procedures	2	2
6	Patient education and Rehabilitation in Cardiology	2	2
7	Cardiopulmonary Resuscitation	4	4
Total Hrs.=48 hrs		**24 hrs**	**24 hrs**

Second Year

Paper – IV

Investigations & Equipments in Cardiology (Invasive & Non Invasive)

Placement: Second Year

Theory=25 Hours
Practical=45 Hours

Sr. No.	Topics / Syllabus	Theory	Demo/ Practical
1	Electrocardiography	4	4
2	Stress testing	4	4
3	Echocardiography	4	8
4	Radiology of heart and Blood vessels Cardiac CT, Cardiac MRI, CT/ MR angiography	4	8
5	Nuclear Cardiology	3	3
6	Defibrillator	1	2
7	Holter Monitoring	1	2
8	Ext Pacemaker	1	2
9	ACT	1	1
Total hrs =70 hrs		**23 hrs**	**34 hrs**

Subsidiary Subjects

1. RESEARCH AND BIO STATISTICS

Placement: Second Year Theory= 20 Hours

Course Description:

Introduction to basic statistical concepts: methods of statistical analysis; and Interpretation of data

Behavioural Objectives:

Understands Statistical terms.

Possesses knowledge and skill in the use of basic statistical and research methodology.

Unit- I: Introduction

- Meaning, definition, characteristics of statistics.
- Importance of the study of statistics.
- Branches of statistics.
- Statistics and health science including nursing.
- Parameters and estimates. 2 hrs
- Descriptive and inferential statistics.
- Variables and their types.
- Measurement scales.

Unit- II: Tabulation of Data

- Raw data, the array, frequency distribution.
- Stem-leaf display
- Basics principles of graphical representation. 2 hrs
- Types of diagrams- histograms, frequency polygons, smooth frequency polygon, commulative frequency curve, ogive.

Unit- III: Measure of Central Tendency

- Need for measures of central tendency
- Definition and calculation of mean- ungrouped and grouped.
- Trimmed mean
- Meaning, interpretation and calculation of median ungrouped and grouped.
- Meaning and calculation of median ungrouped and grouped. 4 hrs.
- Meaning and calculation of mode.

- Comparison of the mean, mode & median.
- Guidelines for the use of various measures of central tendency.

Unit- IV: Measure of Variability

- Need for measure of dispression.
- The range, the average deviation. 4 hrs
- The variance and standard deviation.
- Calculation of variance and standard deviation ungrouped and grouped.
- Properties and uses of variance and SD

Unit- V: Measures of Skewness & Kurtosis

- Needs for measure of skewness & Kurtosis
- Karl pearson's co-efficient of skewness 1 hrs
- Types of Kurtosis

Unit- VI: Samling Techniques

- Need for sampling-Criteria for good samples
- Application of sampling in Community. 6 hrs
- Procedures of sampling and sampling designs errors.
- The normal distribution.
- Sampling variation and tests of significance.
- Student's t-test, chi-square test, z-test.

Unit- VII: Health Indicator

- Importance of health Indicator
- Indicators of population, morbidity, mortality, health services. 1 hrs
- Calculation of rates, and rations of health.

Recommended Books

- B.K. Mahajan & M. Gupta (1995) Text Book of Preventive & Social Medicine, 2002, 17th Edition Jaypee Brothers.

2. Computer Application & Database Management

Placement: Second Year Theory= 20 Hours

The course enables the students to understand the fundamentals of computer and its applications.

Introduction to data processing:
Features of computers, Advantages of using computers. Getting data into/out of computers. Role of computers. What is Data processing? Application areas of computers involved in Data processing. Common activities in processing. Types of Data processing. Characteristics of information. What are Hardware and software?

Hardware Concepts:
Architecture of computers, Classification of computers, Concept of Damage. Types of storage devices. Characteristics of disks, tapes, Terminals, Printers, Network. Applications of networking concepts of PC System care, floppy care, Data care.
Concept of software.

Classification of software: System software. Application of software. Operating system.
Computer system: Computer Virus. Precaution against viruses. Dealing with viruses.
Computers in Medical electronics.
Basic Anatomy of Computers.
Principles of programming.
Computer application- principles in scientific research; work processing, medicine, libraries, museum, education, information system.
Data Processing
Computer in physical therapy- principles in EMG, Exercise testing equipment, Laser.

III Year B.Sc. (Cardiac Technology)

Paper I

Cardiac Invasive Care and Emergencies

Sr No.	Topic	Theory	Demo/Practical
1	Introduction to intensive cardiac care	4	4
2	Monitoring in non invasive care & invasive care	6	6
3	Acute coronary syndrome including clinical presentation & principles of management	8	8
4	Cardiac failure (clinical presentations & principles of management)	6	6
5	Drugs in invasive care unit including thrombolytic (formulations, administrations and principles of management	8	8
6	Cardiac arrhythmias (clinical presentation 7principles of management)	6	6
7	Circulatory and ventillatory assistance in invasive care	3	3
	Total hrs	41 hrs	41 hrs

III Year B.Sc. (Cardiac Technology)

Paper II

Cardiac Diseases and Invasive Management

Sr No.	Topic	Theory	Demo/Practical
1	Introduction To Invasive Cardiology & cardiac catheterization	3	3
2	Radiation safety	1	1
3	Coronary angiography	2	2
4	Coronary angioplasty	3	3
5	Pacemaker implantation	2	2
6	Balloon volvotomy	3	3
7	Pediatric catheterization and interventions	2	2
8	pericardiocentesis	1	1
9	Complications of cardiac interventions and their management	2	2
10	Principles of electrophysiological studies and ablation.	2	2
	Total hrs	21	21

Exam Pattern.

1. **Internal Exams: TWO in number.**

Theory exam

Exam	Time to conduct internal exams	Theory Marks	Practical Marks
1.Mid Term Exam	After 6 month from starting the course	40	20
2.Pre final Exam	Atleast 1 month prior to final university exam.	80	40
Total		120	60
Internal Assessment (to be scaled down from total of the two exams)		Out of 20	Out of 10

2. **University Exam: (exam at the end of each year)**

Final marks distribution

University Exam	Theory	Practical
University exam	80	40 (30Pra+10Viva)
Internal Assessment	20	10
Total Marks	100	50

Exam paper pattern Theory (Prefinal Exam)

Question type	No. of questions	Questions to be answered	Question X marks	Total marks
Long essays	3	2	2x10	20 marks
Short essays	8	6	6x 5	30 marks
Short answers	12	10	10x 3	30 marks
				Total= 80 marks

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

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

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

Keep in all PG Courses MD/MS & AHS

3.3 **Medicine and Allied :**

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

(i) Topics in Chest Medicine : ARDS, OSA and Pulmonary Thrambo-Embolism which should be covered in two lectures.

(ii) Care of Terminally ill patient under the heading of Geriatric Medicine.

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

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

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

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

Keep in all UG & PG Courses

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

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

Section C (Marks 10)

C1 Psychiatry Section (Marks 10)

Question 1 – long question (Marks 4)

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

a.

b.

c.

C2 Dermatology Section (Marks 10)

Question 1 – long question (Marks 4)
Question 2 – Short answer question attempt any 2 (Marks 6)
a.
b.
c.

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

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

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

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

3.4 Surgery and Allied :

Resolution No. 3.4(a): Resolved that :

(i) Topic of Polytrauma and its management be included in the Orthopedic UG syllabus in consultation with Surgery Department for the batch of Students entering into 3rd MBBS (Part-II) from February 2016 onwards.

(ii) Following Topics be excluded from the Orthopedic UG syllabus for the batch of Students entering into 3rd MBBS (Part-II) from February 2016 onwards :

a) Acute poliomyelitis

b) Fungal infection and Leprosy in orthopedic

c) Cerebral Palsy and rehabilitation

MGM INSTITUTE OF HEALTH SCIENCES

(Deemed University u/s 3 of UGC Act, 1956)
Grade 'A' Accredited by NAAC
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Email: registrar@mgmuhs.com | Website: www.mgmuhs.com

MGM/01/AC - 21 /2017/672

14th June, 2017

INTRA OFFICE NOTE

To:
Jt. Controller of Examinations
MGM Institute of Health Sciences,
Navi Mumbai

Sub.: Subjects in 3rd Year B.Sc. (Cardiac Care Technology) Examination

We refer to your Intra Office Note No. MGMIHS/X-1/ION-26/2017 dated 13th June, 2017 informing us of the mismatch of subjects in 3rd Year B.Sc. (Cardiac Care Technology) Examination.

We furnish below the topics of Paper – I, Paper – II and Paper – III of IIIrd year B.Sc. (Cardiac Technology) reconciled topic wise for your information to clear the anomaly of mismatch of subjects and hope you will now find the same in order:-

IIIrd YEAR B.Sc. (Cardiac Technology)			
PAPER – I			
Cardiac invasive care and emergencies			
Sr. No.	**Topic**	**Theory**	**Demo/ Practical**
1.	Introduction to Intensive cardiac care	4	4
2.	Monitoring in non invasive care & invasive care	6	6
3.	Acute coronary syndrome including clinical presentation & Principles of management	8	8
4.	Cardiac failure (clinical presentations & principles of management)	6	6
5.	Drugs in invasive care unit including thrombolytic (formulations, administrations and principles of management	8	8
6.	Cardiac arrhythmias (clinical presentation & Principles of management)	6	6
7.	Circulatory and ventilatory assistance in invasive care	3	3
	Total Hours	41	41

Contd..2

15/6/17

IIIrd YEAR B.Sc. (Cardiac Technology)			
PAPER – II			
Cardiac Diseases and Invasive Management			
Sr. No.	Topic	Theory	Demo/ Practical
1.	Introduction to Invasive Cardiology & Cardiac Catheterization	3	3
2.	Radiation safety	1	1
3.	Coronary angiography	2	2
4.	Coronary angioplasty	3	6
5.	Pacemaker implantation	2	2
6.	Balloon volvotomy	3	3
7.	Pediatric catheterization and interventions	2	2
8.	Pericardiocentesis	1	1
9.	Complications of cardiac interventions and their management	2	2
10.	Principles of electrophysiological studies and ablation	2	2
	Total Hours	21	21

IIIrd YEAR B.Sc. (Cardiac Technology)			
PAPER – III			
Investigations and equipments in invasive cardiology			
Sr. No.	Topic	Theory	Demo/ Practical
1.	Pre Catheterization assessment	2	2
2.	Post Catheterization care and assessment	2	2
3.	Sterilization procedure (including autoclave ETO, fumigation)	4	4
4.	Catheterization laboratory infrastructure and equipments	6	6
5.	Hardware use in catheterization laboratory (including , catheters, wire, leads, devices, balloons, stents etc.)	8	8
6.	Radio opaque contrast	2	2
7.	Drugs used in invasive cardiology (antiplatelets, anticoagulants, GpIIbIIIa inhibitors etc.)	3	3
8.	Introduction to cardiovascular surgery	3	3
	Total Hours	30	30

Registrar

Dr. Rajesh B. Goel
Registrar
MGM Institute of Health Science
(Deemed University u/s 3 of UGC Act, 19
Navi Mumbai- 410 209

Copy to:

Director, MGM School of Biomedical Sciences – Navi Mumbai / Aurangabad: for information

Resolution passed in BOM – 48/2017, dated 24/01/2017

Item No. 5.11: BOS (Biomedical Sciences) dated 16.09.2016

m) To review the structure of Theory Exam Pattern of B.Sc. (Paramedical) Courses: It was decided to change the pattern of Theory exam pattern with more options in SAQ (10 marks) and LAQ's (20 marks) for 2nd and 3rd year. For first year question paper pattern will remain same.

Resolution No. 5.11(m): Resolved to approve the change in the pattern of Theory exam of B.Sc. (Paramedical) Courses for 2nd and 3rd year [as per **Annexure-IX of BOM-48/2017**] while the first year question paper pattern will remain same, to be effective for batch entered in 2nd year/3rd year in Academic Year 2016-17 onwards.

ANNEXURE - IX

MAHATMA GANDHI MISSION
MEDICAL COLLEGE & HOSPITAL
Ph-27437668, 27437990, Fax 911-22-7420320

MGMMCH/Ophthal Dept./2016/ 26 Date: 16.09.2016

To,
The Director,
MGM School of Bio Medical Sciences,
Kamothe , Navi Mumbai

Sub: Changing format of B.Sc Optometry Question paper.

Respected Sir

We Faculty of Ophthalmology Department of MGM College Kamothe along with external examiner from by D.Y. Patil Medical college Nerul wish to bring Change in format of Question paper since the existing one is not approprite.

We all (Department of Ophthalmology as well as other Depts)who conduct paramedical courses feel that the question paper is very lengthy hence it is difficult to set question paper and check the Answer sheet.

We sincearlly request you to effect the changes.

Thanking you.

FOR

Professor & HOD
Department of Ophthalmology

Dr. Vardhan Gore

16/9/16

(FINAL UNIVERSITY EXAMINATION- EXISTING THEORY EXAM PATTERN)

Question type	No. of questions	Questions to be answered	Question X marks	Total marks
Long essays	3	2	2x10	20 marks
Short essays	8	6	6x 5	30 marks
Short answers	12	10	10x 3	30 marks
				Total= 80 marks

COPY OF

MGM INSTITUTE OF HEALTH SCIENCES, NAVI MUMBAI
SECOND B.Sc. (Optometry Technology) UNIVERSITY EXAMINATION JULY-2015
Third Year

MGMH/KAM/OPH/2015 Date :

Subject : Community Eye Health & Eye Banking Total marks :80

INSTRUCTION :

1. Attempt all sections
2. Maximum Marks are indicated in the right
3. Illustrate the answer with suitable diagram wherever necessary
4. Please surrender your SWITCHED OFF cell phones at entry point into the examination Hall
5. Mobile phones , pagers ,bluetooth or any other such communication devices are not allowed in the examination premises and in the adjacent area

III Year

Q.1 Long Answer Question (Answer any Two) 2x10= 20marks

1. Vision 2020:Right to sight
2. National programme for control of blindness-I
3. Rehabilitation of visually handicapped

Q.2 Short Essay Question (Answer any Six) 6x5=30marks

1. Screening procedures in ophthalmology
2. School eye screning programme
3. Organisation of eye camp
4. Primary eye care
5. Enucleation
6. Preservation of donor cornea
7. Methods of publicity of eye donation
8. Contra-indication of eye donation

Q.3 Short Answer Question (Answer any 10) 10x3=30marks

1. Concepts of community ophthal
2. Visual acquity testing in school children
3. Pre- oprative instructions of cataract surgery
4. Post –operative instructions of cataract surgery
5. How to donate your eyes?
6. Public education regarding common eye diseases
7. Components of an eye back
8. Sac syringing
9. Methods to screen IOP
10. Presbyopic correction in an eye camp
11. Vitamin A prophyeaxis:Doses & schedule
12. Blanket therapy in trachoma.

(COPY OF NEW PROPOSED QUESTION PAPER FORMAT)

MGM INSTITUTE OF HEALTH SCIENCES, NAVI MUMBAI
SECOND B.Sc. (Optometry Technology) UNIVERSITY EXAMINATION JULY-2016
Third Year

MGMIH/KAM/OPH/2016 Date :
Total marks :80

Subject : Community Eye Health & Eye Banking

INSTRUCTION :

1. Attempt all sections
2. Maximum Marks are indicated in the right
3. Illustrate the answer with suitable diagram wherever necessary
4. Please surrender your SWITCHED OFF cell phones at entry point into the examination Hall
5. Mobile phones , pagers ,bluetooth or any other such communication devices are not allowed in the examination premises and in the adjacent area

III Year

Q.1 Long Answer Question (Answer any Two) **2x15=30 marks**

1) Methods of Eye Preservation.
2) Rehabilitation of visually handicapped
3) National programme for control of blindness-I

Q.2 Short Essay Question (Answer any five) **5x10=50marks**

1) Vision 2020:Right to sight
2) Eye Banking
3) Organisation of eye camp
4) Primary eye care
5) Evisceration
6) Preoperative workup for corneal transplant.
7) Methods of publicity of eye donation

All B.Sc. paramedical courses of CSMU

Resolution No. 1.3.14.4 of BOM-51/2017: Resolved to include Common lectures for General Pharmacology and ANS, for all Second year B.Sc. Paramedical courses. Further it was resolved to include and continue these topics in existing batch of 2016-17(2nd year B.Sc.) and henceforth. **Annexure-XXXII**

Annexure 5.4

Proposal put forward for common lectures for General Pharmacology and Autonomic Nervous System (ANS) was approved and will be implemented for batch 2016-17(2nd year BSc). The approved number of hours and topics are as per below:-

Course Name	No. of Hrs (General Pharmacology)	No of Hrs. (ANS)
CT, PT. DT, AT/OT, Optometry	6	5

Note:

1. Topics for General Pharmacology – Sources and routes, Pharmacokinetics, Pharmacodynamics, Adverse Drug reactions
2. Topics for ANS to be included in syllabus for all 5 courses – Cholinergic agonist, Anticholinergic, Adrenergic agonist, Alpha blockers, Beta blockers

Resolution No. 1.3.14.3 of BOM-51/2017: Resolved to approve the List of Textbooks for B.Sc. Paramedical Courses / M.Sc. Molecular Biology. [Annexure-XXXI]

CARDIAC TECHNOLOGY Seond Year		
Subject	**Book Name**	**Author**
anatomy Physiology & Pathology	Anatomy& Physiology	rose& wilson
	anatomy& Physiology	Singh
	Cardiovascular Physiology	AchillesJ. Papano Gil Wier
	Human anatomy	Chaurasia
	Manipal Manual of Anatomy for Allied Health	
Cardiac Diseases & Its management	Practical Cardiology-Evaluation and Treatment of Common Cardiovascular Diseases	Raghavendra A. Baleja, Kim A Eagle
Investigations & Equipments in Cardiology	Cardiac Nursing	Elaine Coady
	Introduction to Medical Surgical Nursing	Black & Joys
	Text Book of Medical Surgical Nyrsing	Brunner & Siddharth
	The ECG in Practice	Hampton
CARDIAC TECHNOLOGY Third Year		
Subject	**Book Name**	**Author**
Cardiac invasive care and emergencies	Procedure Manuel For Critical Care	Dabra Lynn; Mchale Wiegen
Cardiac diseases and invasive management	Pocket Companion of Critical care Nursing	Shaila malander
Investigations and equipments in invasive cardiology	Principles of Critical Care	Udwalia
	Cardiovascular Nursing - Management for Positive Outcomes	Mary Lucila & Aleyamma Eapen

Resolution No. 4.13 of BOM-55/2018: Resolved as follows:-

(i) Slow learners must be re-designated as potential learners.

(ii) Students scoring less than 35% marks in a particular subjects/course in the 1st formative exam are to be listed as potential learners. These learners must be constantly encouraged to perform better with the help of various remedial measures.

(iii) Students scoring more than 75% marks in a particular subjects/course in the 1st formative exam are to be listed as advanced learners. These learners must be constantly encouraged to participate in various scholarly activities.

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

Grade 'A' Accredited by NAAC

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