MGM INSTITUTE OF HEALTH SCIENCES

(Deemed to be University u/s 3 of UGC Act, 1956)
Grade 'A' Accredited by NAAC
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Curriculum for

B.Sc. Optometry

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 - 43/2015 [Resolution No.3. 3(d)], Dated 06/11/2015.
3. As Amended in BOM - 48/2017 [Resolution No.5.11], Dated 24/01/2017.
4. As Amended in BOM -51/2017, [Resolution No.1.3.14.3], [Resolution No.1.3.14.4] Dated 28/08/2017.
5. As Amended in BOM -55/2018 [Resolution No. 4.13], Dated 27/11/2018.

New

Annexure XX

Curriculum for

B.Sc. (Optometry)

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. (Optometry)

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	45hrs	15hrs	60 hrs.	40 marks	10 marks	
	Section B	Biochemistry	40hrs	20hrs	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	48hrs	12hrs	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

Main Subjects(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	Ocular Anatomy, Physiology Biochemistry& Pharmacology	-	-	-	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
2.	Paper II	Optics-Physical & Physiological	-	-	-	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
3	Paper III	Common eye diseases and Ocular Pharmacology	-	-	-	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
4	Paper IV	Clinical Optometry Visual & Dispensing	-	-	-	80 marks	40 marks (30Prac+ 10Viva)	30 marks 20(T)+ 10(P)	150 marks
Total:-									600 marks

Subsidiary Subjects(Second Year)

Sr. no.	Subjects	Teaching hours			University examination Marks	Internal assessment marks	Total marks
		Theory	Pracs	Total			
1	*Research & Biostatistics	20hrs	-	20 hrs	-	-	-
2	*Computer application & Database Management	20hrs	-	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	Community Eye health & Eye Banking	-	-	-	80 marks	40 marks (30Prac. +10Viva)	30 marks 20(T)+ 10(P)	150 marks
2.	Paper II	Clinical Optometry-Orthoptics	-	-	-	80 marks	40 marks (30Prac. +10Viva)	30 marks 20(T)+ 10(P)	150 marks
3	Paper III	Clinical Ophthalmic Techniques and dispensing optics	-	-	-	80 marks	40 marks (30Prac. +10Viva)	30 marks 20(T)+ 10(P)	150 marks
4	Paper IV	Investigative Orthoptics	-	-	-	80 marks	40 marks (30Prac. +10Viva)	30 marks 20(T)+ 10(P)	150 marks
Total:-									600 marks

First Year Common Syllabus

B.Sc. Optometry

Paper-I
Anatomy

Placement:-First Year

Theory-35 Hours
Practical-25 Hours

Theory:-

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	1	
	• Heart	1	1
	• Circulation- Systemic and Pulmonary	1	
	• Major branches from Arch of Aorta	1	1
	• Major Veins		
7	Digestive system		
	• Mouth, Tongue,	1	½
	• Pharynx, Oesophagus,	1	½
	• Salivary glands		
	• Stomach, Small and Large Intestine	1	1
	• Liver, Spleen, Pancreas, Gall Bladder	1	2
8	Excretory system		
	• Kidney, Ureter	1	1
	• Bladder, Urethra	1	1
	• Skin	1	
9	Reproductive system		
	• Male- Testis, Spermatic Cord	1	½
	• Female- Ovaries, FT, Uterus	1	½
10	Lymphatic system		
	• Tonsil	1	
	• Lymph node groups- Cervical, Axillary, Inguinal	1	
11	Endocrine system		
	• Thyroid, Parathyroid	1	
	• Adrenal, Pitutary	1	
12	Nervous system		
	• Neuron	1	
	• Parts of nervous system	1	
	• Brain, spinal cord, brain stem	1	
	• Cranial and peripheral nerves		
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 5 Hrs
Anaemias: Causes, effects & treatment.
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 — 4 Hrs
Pregnancy test
Parturition.Contraceptives.
Lactation : Composition of Milk
Advantages of breast Feeding.

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-20Hours

No.	Syllabus	Lect. Hrs.
1	Introduction and scopeofbiochemistry	1
2	**Chemistryof carbohydrates,proteins,lipids and nucleicacid** I)Carbohydrates:Structure, properties,chemical reactions and functions. Aminoacid:Essentialandnonessentialaminoacidswithstructureand function. iii)Proteins:Definition,Classification,StructureofProteins,Denaturationof Proteins,Primary,SecondaryTertiaryandQuaternary(overview) iv) Lipids: Classification and properties. Introduction, Simple Lipids, Compound Lipids, Derived Lipids, Essential Fatty Acids. v) Nucleicacid:Structureofpurineandpyrimidinebases,nucleotidesand nucleosides. DNAandRNA:structure andproperties.	2 1 2 2 2
3	Elementaryknowledgeofenzymes:Classification,mechanismofenzyme action,Enzymeinhibition,enzymespecificity.Roleofcoenzymes	3
4	Briefconceptofbiologicaloxidation:Electrontransportchain.inhibitorsand uncouplersbriefly.	2
5	Outlineofdigestion,absorptionandmetabolismofcarbohydrate,proteins andfats. 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.Ureacycle. iii)Lipidmetabolism:Cholesterolmetabolism,Ketonebodiesformationand breakdown iv)Nucleic acidmetabolism:Purinecatabolism	2 3 2 2 1
6	Importanceofsomeminerals-sodium,potassium,calcium,phosphorous, iron,copper, chloride,fluoride.	2
7	Nutritional aspectsofcarbohydrates,fats, proteins,balanceddiet.	1

8	Introductiontomedicallabtechnology:GeneralintroductionRoleofmedical labtechnologists,andresponsibility,safety measuresandfirstaid.Cleaning and careof general laboratory glassware and equipment. Elementary knowledge ofanalytical biochemistry. Principles, functionsand 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.	**60hrs.**

First Year

Paper-III
Section-A

PATHOLOGY

Placement:-First Year

Theory-42 Hours
Practical-18 Hours

Sr. No.	Topic	No.of lectures	Numberof Practical	Total
1	IntroductiontoPathology	01	--	01
2	Workingandmaintenanceofinstruments	02	03	05
3	General principles of Histopathology techniques collection,fixation, processing&routinestaining	05	03	08
4	GeneralprinciplesofCytopathologytechniques collection,fixation, processing&routinestaining	05	02	07
5	GeneralprinciplesofHaematologytechniques collection,fixation, processing,routinestaining, Haemoglobin,TLC,DLC, Peripheral smear, automatic cellcounter	05	03	08
6	GeneralprinciplesofClinicalPathologytechniques sample collection, processing for routine test, normal urine& urine examination	05	03	08
7	General principles of Blood Bank techniques antigen,antibody,ABO&Rhsystem	05	03	08
8	GeneralprinciplesofAutopsy&Museum	02	01	03
9	General Pathology including introduction to inflammation,circulatorydisturbances &neoplasia	05	--	05
10	Systemic pathology basis and morphology of commondisorderslikeanemia,leukemia,AIDS,TB, Hepatitis &malaria	05	--	05
11	Maintenance and medico legal importance of recordsandspecimens	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.		**48hrs**	**12hrs**

First Year

Subsidiary Subjects

1. ENGLISH

Placement:-First Year Theory-60Hours

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	3 Hrs	• Debate • Participating in Seminar, Panel discussion, Symposium • Telephonic Conversion

		□ Telephonic Conversation Conversational skills (Formal, Neutral & informal situation)		Conversation in different 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, Thoratpatil& 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 allFirst year

B.Sc. courses.

Main Subjects:

Paper I: Anatomy

Theory pattern: University Examination

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	2x10mks	20 marks
Short essays	8	6	6x 5mks	30 marks
Short answers	12	10	10x 3mks	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	1x10mks	10 marks
Short essays	5	3	3 x 5mks	15 marks
Short answers	7	5	5x 3mks	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	1x10mks	10 marks
Short essays	5	3	3 x 5mks	15 marks
Short answers	7	5	5x 3mks	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	1x10mks	10 marks
Short essays	5	3	3 x 5mks	15 marks
Short answers	7	5	5x 3mks	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	1x10mks	10 marks
Short essays	5	3	3 x 5mks	15 marks
Short answers	7	5	5x 3mks	15 marks
				Total= 40 marks

Second Year B.Sc. (Optometry)

Second Year

Thirty six theory lectures per month (each one hour) and two seminars in a month (each two hours)

Total theory time per month: 12hrs/week

Practical postings: 28hrs/week

Total academic time per month: **40hrs/week**

Main Subjects

Theory Subject

Paper I

Ocular Anatomy, Physiology, Biochemistry & Pharmacology

1. Ocular Anatomy
2. Visual pathway
3. Protective Mechanism in the Eye
4. Extra ocular
5. Visual acuity and form sense
6. Pupillary reflexes
7. Accommodation
8. Convergence
9. Intra Ocular Pressure
10. Night Vision
11. Colour Vision
12. Visual Fields
13. Extrinsic Muscles,
14. Actions and Ocular Movements

Basic Biochemistry,

1. Tears film and pH.
2. Rhodopsin cycle
3. Aqueous and Vitreous humours

Pharmacology

1. Basic Mechanisms of action of Drugs.
2. Principals of Ocular pharmacology,
3. Optometric diagnostic drugs.

Paper II

Optics- Physical and Physiological

1. Principles of Refraction.
2. Physical Optics -1, Lens Shapes -Convex, Concave
3. Physical Optics -2, Thin Lens equation, thick lens equation
4. Physical Optics -3, Front and back vertex power
5. Physical Optics -4. Aberrations
6. Physical Optics -5. Spherical, Cylindrical &Toric surfaces, Aspheric surfaces
7. Prisms -definition, uses, nomenclature, apex
8. Determination of focal length &diopteric power of lens
9. Strum's Conoid
10. Neutralization of lenses
11. Focimeter
12. Centre & Axis Marking by focimeter
13. Simple &Toric transposition
14. Prismatic effect &Decentration
15. Aberrations & Tints in spectacle Lenses
16. Spectacle Frames -History, Nomenclature, Types & parts, sides, joints, frame bridge.
17. Shape of Spectacle Frame -Measurements & Making, Frame & Face Measurements
18. Contact Lenses:- History and Development
19. Types of Contact Lenses

Paper III

Common Eye Diseases & Ocular Pharmacology

1. Common Eye Disease.
   - i. Trachoma,
   - ii. Corneal Ulcer,
   - iii. Conjunctivities,
   - iv. Red Eyes,
   - v. Eye Signs In Malnutrition,
   - vi. Glaucoma,
   - vii. Cataract
   - Viii Squints.

To be taught very briefly

1. Ocular Pharmacology – An introduction
2. Routes of drug administration
3. Miotics, Mydriatics&Cycloplegics drugs
4. Antibacterial drugs & therapy
5. Antifungal drugs & therapy
6. Anti-Viral drugs & therapy
7. Antibacterial drugs & therapy
8. Anti-inflammatory drugs & therapy
9. Anti-glaucoma drugs & therapy
10. Ophthalmic dyes
11. Local Anaesthetics
12. Ocular irrigating solutions
13. Ocular antiseptics & disinfectants
14. Contact lens solution

Paper IV

Clinical Optometry Visual & Dispensing

Visual Optics

1. Emmetropia&Ammetropia -Aetiology, Population, Distribution,Growth of eye,
2. Myopia
3. Hypermetropia
4. Astigmatism
5. Aphakia/Pseudo-phakia
6. PresbyopiaCourse and Cur r iculum of B Sc (Ophthalmic Techniques) 7
7. Keratoconus
8. Post-Op. Refractive errors
9. Refraction of irregular reflex
10. Accommodation & Convergence -1, Far point, near point, range, amplitude of accommodation
11. Accommodation & Convergence -2. Methods of measurements, NPA. AC/A ratio.
12. Retinoscopy -Principle & Methods
13. Objective Refraction
14. Subjective Refraction
15. Cross Cylinder
16. Bifocals
17. Final Checking & Adjustments to prescriptions

Optics
Dispensing Optics

1. Measurement for ordering spectacle, IPD, Marking centration, V. D. Calculation.
2. Fitting Bifocals, Multifocals, Prism Lenses
3. Fitting Lenses in Frames
4. Glazing & Edging
5. Final Checking, Adjustments to prescriptions
6. Patient complains, handling correction.
7. Repair of spectacles
8. Special types of spectacles monocells/ptosis hemianopic glasses
9. Neutralization of lenses

10. Lens Designs -Ashperic
11. High Index Lenses,
12. Photocromatic Lenses
13. Tinted Lenses
14. Polaroid Lenses
15. Shape of Spectacle Frame -Measurements & Making, Frame & Face Measurements
16. Refraction under the supervision

Contact Lenses

1. Fitting of contact lenses
2. Disposable contact lenses
3. Speciality of contact lens
4. Complications ofcontact lenses.

Subsidiary Subjects

Second Year

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 dispersion.
The range, the average deviation.
The variance and standard deviation. 4 hrs
Calculation of variance and standard deviation ungrouped and grouped.
Properties and uses of variance and SO

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

Unit- VI: Sampling Techniques
Need for sampling-Criteria for good samples
Application of sampling in Community.
Procedures of sampling and sampling designs errors. 6 hrs
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.
Calculation of rates, and rations of health. 1 hrs

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

Second Year

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.

Third Year B.Sc. (Optometry)

Main Subjects

Theory Subject

Paper I

Community Eye Health & EyeBanking

1. Concepts of community Ophthalmology
2. Screening procedures in Ophthalmology
3. School eye screening programme
4. Primary eye care
5. Organization of Outreach services
6. Organization of Reach-in-Programme
7. Information, Education, communication
8. Rehabilitation of the visually handicapped
9. National programme for control of Blindness – I
10. Vision 2020 : The Right to sight

Eye banking

1. Publicity
2. How to donate your eyes
3. Collection of eyes
4. Preservation of eyes
5. Pre-operative Instructions
6. Post-operative Instructions
7. Latest techniques for preservation of donor Cornea

Paper II

Clinical Optometry-Orthoptics

Orthoptics

Basic Concept

1. Latent squint work-up
2. Synoptophore
3. Maddox wing
4. Maddox rods
5. Prism bar
6. Near point of accommodation
7. Near point of convergence
8. Fusion exercises

Investigative Orthoptics

More details of clinical applications

1. Orthoptics-General Concept
2. Ocular muscles and movements
3. AC/ A ratio
4. Measurements of angle of squint
5. Latent squint
6. Maddox rod
7. Maddox wing
8. Synoptophore
9. Manifest concomitant
10. Squint concomitant
11. Paralytic Squint
12. Head posture and its significance
13. Hess Screening and its Interpretations
14. Pleoptics
15. Occlusion -types and uses
16. Nystagmus
17. A. V. Syndromes
18. Testing of ARC
19. Amblyopia
20. Disorders of accommodation
21. Paediatric visual acuity assessment
22. Paediatric Refraction
23. Neural aspects of binocular vision

Paper III

Clinical Ophthalmic Techniques and Dispensing Optics

Ophthalmic lens:
1.Characteristics of lenses:
Introduction. Spherical lenses. Plano-cylindrical lenses. Sphero-cylindrical lenses. Designation of lens power.
Power of lenses.Transposition. Write the prescription. Base curve of spherical lens.Base curve of cylindrical single vision lens.Aberration of lens.Prism prescription.Prism effects in a lens.Neutralization.
2.Spectacle lenses:
Characteristics of lens materials. Specific gravity (weight). Refractive index.Abbe number.Impact resistance.
Scratch resistance.Curve variation factor.
3.Current materials:
Crownglass.CR-39. High –index glass. High –index plastic. Poly carbonate.Photochromatic materials.
4.Lens types:
Single vision lens. Bi-focal lenses. Tri-focal lenses. Vocational & occupational multifocal progressive
lenses.
5.Introduction of bi-focal lenses:
History of bi-focal lenses.Modern bi-focal designs.Types of bi-focal designs.Glass tri-focal lenses.
Invisible multi-focal Double segment lens.Plastic bi-focals.
6.Opthalmic lens coating:
Anti-reflecting coatings.Special notes concerning anti-reflecting coatings. Protective coating, color
coating.
7.Absorptive lenses:
Classification of lens tints. Chemical that produces color & assist in absorptive characteristics of glass
lenses. Effect in prescription on lens color.Availability of tinted lenses.
8.Impact resistant lenses:
Types of impact resistant lenses. Plastic lenses. Impact resistant Dress-Eye wear lenses. Tempered glass
lenses. Types of impact resistant lenses most beneficial of specific patients.
9.Lens for special uses:
Fresnel lenses. Thinlite lenses. Lenses for the Aphakic patient. Aspheric lenses.
10. Lens surfacing & quality. Principles of lens surface generation. Glass assessment. Faults in lens

materials& lens surface. Inspection of lens quality.
Basics of dispensing:
1.Spectacle frame
Current frame materials:
a) Plastics
b) Metals
Frame types:
a) Combination of frames
b) Half-eye frames
c) Mounts
d) Nylon-cord frame
e) Special purpose frames.
2.Frame measurements:
a) The boxing system
b) The datum system
c) Comparison of the two systems
d) Lens position
e) Segment specification
3.Frame Selection:
a) Fashion
b) Function
c) Feel
d) Conflicting needs
e) Price
f) Standard alignment
4.Lens Selection:
a) Ground rule for selection
b) Selection criteria
5.Facial Measurement:
a) The PD
b) Visual axes
c) Measuring inter papillary distance
d) Using PD ruler
e) Common difficulties in measuring PDs
f) Measuring monocular PD
g) Measuring near PD
6.Measuring heights:
a) Single vision
b) Multi focal
c) Bi-focal
d) Progressive
7.Pediatric Dispensing:
a) The changing image of spectacle
b) Age differences.
Frame Selection

a) Technical Criteria
b) Fashion criteria
c) Some tips on selection

Lens SelectionTechnical criteria

a) Communicating with kids.
b) The kids corner

Facial measurement of the kids

a) PDs
b) Centers
c) Bi-focals

8.Dealing with problems:

a) Dealing with clients
b) Common client problems
c) Dealing with professional colleagues
d) Dealing with the laboratories

9.Special needs dispensing:

a) Occupational dispensing
b) Hazards in the work place
c) Occupational health safety legislation
d) Common hazards.

10.Eye protection:

a) Industrial eye protection
b) Sport
c) Standards covering eye protection
d) Lens materials & impact resistance
e) Frame & eye protection.

Paper IV

Investigative Orthoptics

Ophthalmic & Optical Instrumentation & Procedure

Uses and basic optics

1. Indirect Ophthalmoscope
2. Direct Ophthalmoscope
3. Slit Lamp (common models)
4. Lensometer
5. Tonometers
6. Fundus Camera
7. External eye photography
8. Auto-refractometer
9. Corneal Examination -1. Placido disc
10. Corneal Examination -2. Keratometer
11. Corneal Examination -4. Specular Microscopy
12. Exophthalmometer
13. Perimeter – Manual & automated
14. Orthoptics Instruments -Home devices
15. Nerve fibre analyzer
16. Frequency doubling perimeter
17. Pachometers
18. Contrast sensitivity tests
19. Glare acuity tests
20. Colour vision tests

Practical

1. Visual Acuity.
2. Neal Vision.
3. Colour Vision.
4. Central, peripheral fields
5. Identification of Lenses, Spherical, Cylindrical, Prism, Neutralization.
6. Retinoscopy.
7. Subjective verification, Aphakia, Children, Presbiopia.
8. Measurement of verification of IPD.
9. Transportation of lens.
10. Common Eye Disease prevention and recognition.
    - viii. Trachoma,
    - ix. Corneal Ulcer,

x. Conjunctivities,
xi. Red Eyes,
xii. Eye Signs In Malnutrition,
xiii. Glaucoma,
xiv. Cataract
xv. Squints.

11. Tonometry.
12. Manifest squint work-up
13. Paralytic squint work-up
14. Pleoptics
15. Orthoptic Exercises
16. Nursing Care, Minor surgical procedures
17. Care of Ophthalmic Equipments
18. Every Student will trained with demonstration and maintain a practical note book

Practical

Ophthalmic instruments and appliances

1. Lensometer, Lens gauge
2. Tonometer
3. Placido disc
4. Keratometer
5. Specular Microscopy
6. Exophthalmometer
7. Perimeter
8. Non Contact Tonometer
9. Slit Lamp
10. Fundus Camera
11. Contrast sensitivity tests
12. Glare acuity tests
13. Colour vision tests

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

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.

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 CH 1 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 CH 1 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

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/ 76 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 OLD QUESTION PAPER

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

MGMH/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

2x15=30 marks

Q.1 Long Answer Question (Answer any Two)

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

5x10=50marks

Q.2 Short Essay Question (Answer any five)

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 7 copies

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]

Optometry Technology

Second Year

Ocular Anatomy, Physiology Biochemistry& Pharmacology	Ocular Anatomy Physiology	basakh
	Pharmacology for Physiotheray	Padmaja Uday Kumar
	Pharmacology for Nurses	Padmaja Uday Kumar
Optics-Physical & Physiological	Mnual of optics and Refraction	P.K. Mukherjee
	Clinical Examination in Opthalmology	P.K. Mukherjee
	Theory & Practices of Optics and Refraction	A.K. Khurana
Common eye diseases and Ocular Pharmacology	Introduction to Medical Surgical Nursing	Black & Joys
	Text Book of Medical Surgical Nyrsing	Brunner & Siddharth
Clinical Optometry Visual & Dispensing	The Contact lense Manual - A Practical Guide to Fitting , 4th edn	Andrew Gasson,Judith Morris
	Opthalmic Lenses and Dispensing	Mo Jolie

Third Year		
Subject	**Book Name**	**Author**
Community Eye health & Eye Banking	Comprehensive Opthalmology	A.k.Khurana
Clinical Optometry-Orthoptics	Modern System of Opthalmomlgy,Theory and Practices of Squint and Orthoptics	A.k.Khurana
Clinical Ophthalmic Techniques and dispensing optics	System For Opthalmic Dispensing ,2nd edn	Borish
	Binocular Vision and Orthoptics - Investigations and Management	Bruce Evans & Sandip Dodhi
	A Practical Approach to Obstetric Anesthesia	Curtis, Devid &Brenda Bucklin

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.

MGM INSTITUTE OF HEALTH SCIENCES

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

Grade 'A' Accredited by NAAC

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