



MGM INSTITUTE OF HEALTH SCIENCES

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

Grade 'A' Accredited by NAAC

Sector-01, Kamothe, Navi Mumbai - 410 209

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B.Sc. Undergraduate Course PO PSO (CBCS Pattern)

Program Name	Program Outcome
B.Sc. Medical Dialysis Technology	After completing this programme, learner will be able to:
	PO1. Demonstrate pre- dialysis patient assessment and understand the knowledge about renal failure (ARF & CRF) and its management.
	PO2. To practice independently on dialyzer extracorporeal blood circuit priming and setting up the machine for dialysis procedure.
	PO3. To manifest aseptic cannulation of AVF/AVG and initiation of aseptic acute vascular access catheter care and dialysis initiation as well as machine disinfection methods.
	PO4. To upgrade knowledge on alarm processing, continuous monitoring of patient and machine during procedure.
	PO5. Demonstrate aseptic decannulation and catheter care after termination of dialysis along with operate and maintain R.O Water treatment plant.
B.Sc. OT & AT	PO1. Graduates holding the above degree have immense scope to work as assistants in operation theatres both India and abroad in Corporate Hospitals, Medical Colleges, Nursing Home.

B.Sc. Medical Imaging Technology	<p>PO1. Students are expected to have an understanding of and implement various advanced image processing algorithms and analyse their performance on datasets to make improvements.</p> <p>PO2. This is achieved through a series of hands on assignments</p>
B.Sc. Medical Laboratory Technology	<p>After completing this programme, learner will be able to:</p> <p>PO1. Evaluate the basic principles of haematology as it relates to red blood cell development, maturation and red blood cell normality of the disease states and associate correct laboratory values to the condition.</p> <p>PO2. List the requirements mandated by the occupational exposure to bloodborne pathogens, hazard communication and other safety protocols applicable to the haematology laboratory.</p> <p>PO3. Explain the function of the parts of the microscope and operate according to proper microscope procedures and to correlate laboratory findings to common disease processes in immunology.</p> <p>PO4. To mandate the occupational exposure to blood borne pathogens, hazard communication and other safety protocols applicable to the immunology laboratory.</p> <p>PO5. To analyse the components that make up a valid quality assurance program in Clinical Chemistry.</p> <p>PO6. Manages and differentiates foundational knowledge of theory and principles related to laboratory medicine.</p> <p>PO7. To collaborate with the patient and other health care professionals in providing quality patient care.</p> <p>PO8. To formulate the relationships of basic physiology to disease processes to normal and abnormal laboratory result.</p>
B.Sc. Cardiac Care Technology	<p>PO1 Students will be trained to apply specialized occupational theory, skills and concepts to work independently as qualified cardiovascular technologist and becomes an integral member of the cardiac catheterization and electrophysiology laboratory teams.</p> <p>PO2 The CVT's primary role is to perform, at the direction of a qualified physician, technical procedures for the diagnosis and treatment of cardiovascular injury and disease.</p>
	<p>PO1 To prepare competent entry-level Perfusionist in the cognitive (knowledge), psychomotor (skills), and affective (behaviour) learning domains.</p>

B.Sc. Perfusion Technology	PO2 To provide a base knowledge of perfusion theory, the skill to implement that knowledge and proficiency in its application in accordance with the needs of healthcare providers and employers.
B.Optomety	Programme Outcomes
	Upon the completion of the course student will be able to:
	PO1 Demonstrate the scientific and statistical principles underlying the practice of optometry. • Examine, diagnose and advise treatment for various ocular disorders
	PO2 Design, manufacture and prescribe diverse optical aids including spectacles, sunglasses,
	ophthalmic lenses, contact lenses etc.
	PO3 Lead actively a team of in various inter-disciplinary and multi-disciplinary health care
	communities.
	PO4 Assist Ophthalmologist or efficiently manage and run any ophthalmic or optical clinic
	industry & trade.
	PO5 Undertake Public Health Optometry projects and vision screening eye camps for educating
	on ocular hygiene and related nutritional and environmental counselling.
	PO6 Recognize epidemiological, environmental and etiological factors that require intervention
	to prevent visual deterioration or ocular disease.
	PO7 Demonstrate knowledge of vision care principles that govern ethical decision making and
	respect for the dignity of the patient.
	PO8 Obtain the pertinent information about a patient using communication, observation and
	diagnostic testing.
	PO9 Use modern techniques and technologies for providing vision care solutions to diverse
	patient population.
	PO10 Recognize the need to engage in lifelong learning through continuing education and
	research
Program Name	Program Specific Outcome
B.Sc. Medical Dialysis Technology	PSO 1 The course will transpire the students into dialysis technologist, instrumentalist, academic researchers and renal care takers. Which could bring revolutionary dialysis specialists.

B.Sc. Operation Theater & Anesthesia Technology	After taking this course...the student will be able to
	PSO 1 Demonstrate ability to prepare and maintain Operation Theater.
	PSO 2 Demonstrate ability to maintain equipment support in an acute care environment.
	PSO 3 Identify and move to maintain a sterile field.
	PSO 4 Follow infection control policies and procedures.
	PSO 5 Manage and maintain theater equipment.
	PSO 6 Demonstrate ability to prepare the patient for operative
	PSO 7 Provide intra-operative equipment and technical
	PSO 8 Demonstrate skills and knowledge to assist anesthetist
	PSO 9 Manage hazardous waste and follow biomedical waste
	PSO 10 Ensure availability of medical and diagnostic supplies.
	PSO 11 Monitor and assure quality.
	PSO 12 Act within the limits of one's competence and authority.
	PSO 13 Work effectively with others.
	PSO 14 Manage work to meet requirements.
	PSO 15 Maintain a safe, healthy, and secure working
After taking this course...	
B.Sc. Medical Radiology & Imaging Technology	PSO 1 The student will learn principles of tomographic imaging
	PSO 2 Learn principles of non-invasive medical imaging
	PSO 3 Understand projections and projection slice theorem
	PSO 4 Various types of data acquisition in tomography - parallel beam, fan-beam and cone-beam as well as circular and helical trajectories of the source and detectors. First to 4th generation of CT.
	PSO 5 Learn transform domain non-iterative 2D and 3D
	PSO 6 Learn the statistical nature of the radiation energy
	PSO 7 Exposed to a class of Algebraic Reconstruction
	PSO 8 Some applications of Tomographic principles in signal
	After completion of this curriculum, a Medical Radiology &
	1. Radiographer
	2. Radiological Technologist
	3. X-ray Technologist
	4. CT scan Technologist
	5. MRI Technologist
	6. Mammography Technologist
	7. Applications Specialist
8. Quality control Technologist	
B.Sc. Medical	PSO 1 The course will promulgate the students into Medical
	PSO 2 This programme is designed to cover all aspects of
	PSO 2 It involves learning of complex diagnostic and

B.Sc. Cardiac Care Technology	PSO 3 This program enables students to acquire skills for management of various cardiac disorders.
	At the completion of course, students will be able to:
B.Sc. Perfusion Technology	PSO 1 Demonstrate clinical skills in cardiopulmonary bypass and mechanical circulatory devices.
	PSO 2 Demonstrate clinical skills in auto transfusion, blood
	PSO 3 Demonstrate clinical skills in laboratory analysis of
	PSO 4 Integrate perfusion theory to clinical applications.
	PSO 5 Demonstrate acquired knowledge of various perfusion equipment and supplies used in the healthcare setting
	The graduates will be knowledgeable in ophthalmic and systemic care to practice as an
B.Sc. Optometry	PSO 1 The graduates will interpret results of common ophthalmic procedures, develop differential
	and definitive diagnoses, including the skillful use of vision care instruments and material.
	PSO 2 The graduates will be skillful in techniques and current technologies, skillful in problem
	solving, and will possess professional, ethical and compassionate behavior and standards.
	PSO 3 The graduates will provide quality eye and vision care appropriate examination, measurement, assessment,
	of eye and vision conditions.
	PSO 4 The graduates will be cognizant and responsive to the
	and possess a commitment to continuously improve knowledge
	PSO 5 The graduates will work and communicate effectively in
	either independently or in a team, and demonstrate significant
	PSO 6 The graduates will possess the initiative and critical
	improve their knowledge through self-study, continuing
	studies.



Dr. Rajesh B. Goel
Registrar

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B.Sc. Undergraduate Course (CBCS Pattern)

Program	Course Name	Outcome
B.Sc. Perfusion Technology B.Sc. Dialysis Technology B. Optometry B.Sc. OT & AT B.Sc. Cardiac Technology B.Sc. Medical Imaging Technology B.Sc. Medical Laboratory Technology (Academi year 2018-19)	1.Human Anatomy Part I	CO1 Comprehend the normal disposition, interrelationships, gross, functional and applied anatomy of various structures in the human body. CO2 Demonstrate and understand the basic anatomy of Respiratory and Circulatory system CO3 Demonstrate and understand the basic anatomy of Digestive and Excretory system
	2.Human Physiology Part I	CO1 To understand the basic physiological concepts of General physiology
		CO2 To understand the basic physiological concepts of Haematology
		CO3 To understand the basic physiological concepts of Nerve-Muscle physiology To understand the basic physiological concepts of Respiratory physiology CO3 To understand the basic physiological concepts of Cardiovascular physiology
		CO1 polymeric biomolecules and their monomeric building blocks.
		CO2 Explain the specificity of enzymes (biochemical catalysts), and the chemistry involved in enzyme action.
		CO3 Explain how the metabolism of glucose leads ultimately to the generation of large quantities of ATP.

		CO4 Describe how fats and amino acids are metabolized, and explain how they can be used for fuel.
		CO5 Describe the structure of DNA, and explain how it carries genetic information in its base sequence.
		CO6 Describe DNA replication.
		CO7 Describe RNA and protein synthesis.
		CO8 Explain how protein synthesis can be controlled at the level of transcription and translation.
		CO9 Summarize what is currently known about the biochemical basis of cancer.
	4 Introduction to National Health Care System	The course provides the students a basic insight into the main features of Indian health care delivery system and how it compares with the other systems of the world
	5 English & Communication skills	CO1 Able to express Better CO2 Grow personally and professionally and Develop confidence in every field
	6 Environmental Sciences	CO1 Current environmental issues and highlight the importance of adopting an interdisciplinary approach. CO2 Sample an ecosystem to determine population density and distribution. CO3 Create food webs and analyse possible disruption of feeding relationships.
B.Sc. Perfusion Technology B.Sc. Dialysis Technology B. Optometry B.Sc. OT & AT B.Sc. Cardiac Technology B.Sc. Medical Imaging Technology B.Sc. Medical Laboratory Technology (Academic year 2018-19)	7. Human anatomy Part II	CO1 Demonstrate and understand the basic anatomy of Reproductive and Lymphatic system. CO2 Demonstrate and understand the basic anatomy of Endocrine ,Nervous system CO3 Demonstrate and understand the basic anatomy of Special senses
	8. Human Physiology Part II	CO1 To understand the basic physiological concepts of Renal physiology, CO2 To understand the basic physiological concepts of Endocrinology & Reproductive physiology, CO3 To understand the basic physiological concepts of CNS, Special senses,

	9.General Microbiology	CO1 Upon completion, students should be able to demonstrate knowledge of microorganisms and the disease process as well as aseptic and sterile techniques.
		CO2 Perform microbiological laboratory procedures according to appropriate safety standards
	10.Basic Pathology & Hematology	CO1 The student should submit the appropriate tissue sections per protocol to demonstrate the lesion and other clinically-relevant information needed for the final pathologic report
		CO2 To aid hematology in the reference ranges for hemoglobin, hematocrit, erythrocytes, and leukocytes in infants, children and adult.
	11. Introduction to Quality and Patient safety	CO1 Upon completion, Students should be able to apply healthcare quality improvement and patient safety principles, concepts, and methods at the micro-, meso-, and macro-system levels.
	12.Medical Bioethics & IPR	CO1 Upon successful completion of the course, students will be able to: Recognize what constitutes an ethical concern in health care
		CO2 Understanding ethical issues in Health care.
		CO3 Understand better the complexity and multi-dimensionality of medical ethical concerns and uniqueness of each problem.
		CO4 Capacity to rationally justify your decision
		CO5 Develop the ability to reason through difficult medical/clinical ethical issues both orally, in the context of a group of their peers, and through written
		CO6 The students get awareness of acquiring the patent and copyright for their innovative works.
		CO7 They also get the knowledge of plagiarism in their innovations which can be questioned legally.

	13. Human Rights & Professional Values	CO1 This course will aim at making the learners acquire conceptual clarity and develop respect for norms and values of freedom, equality, fraternity and justice. CO2 It will include awareness of civil society organizations and movements promoting human rights. CO3 This will make the students realize the difference between the values of human rights and their duties
B.Sc. Cardiac Care Technology	14. Applied Anatomy, Physiology, Pharmacology in Cardiac Care	CO1 To understand Coronary Anatomy
		CO2 To enable students, differentiate between normal heart sounds and murmurs.
		CO3 To enable students, a preliminary understanding of the circulatory system from a physiological and functional perspective, as well as related terminologies.
		CO4 Students will be proficient in Pharmacology with proficient knowledge about the different drugs / medicines to be given in various cardiovascular diseases, dose calculation and mode of administration.
		CO5 Also recent advances in pharmacology will play a key role in research aspect of the students.
	15. Basic Electrocardiography	CO1 To develop understanding regarding Electrocardiography and its procedure.
		CO2 Describe the proper hook-up procedure for a 12-Lead ECG
		CO3 Identify basic normal ECG waveform morphology and common interpretation.
		CO4 Enumerate the measures to be taken before, after and during ECG procedure.
	16. Basic Echocardiography	CO1 To develop an understanding regarding Echocardiography.
		CO2 To train students to perform Echocardiography examinations by explaining the position of transducers.
		CO3 To make students aware of recent advances in Echocardiography.

		CO4 To understand the role of Cardiac Care technician while assisting the Cardiologist as well as when performing individually.
	17.Pursuit of Inner Self Excellence (POIS)	CO1 Students will become self dependent, more decisive and develop intuitive ability for their study and career related matter.
		CO2 Student's ability to present their ideas will be developed.
		CO3 Enhanced communication skills, public speaking & improved Presentation ability.
		CO4 Students will be able to explore their inner potential and inner ability to become a successful researcher or technician & hence become more focused.
		CO5 Students will observe significant reduction in stress level.
		CO6 With the development of personal attributes like Empathy, Compassion, Service, Love & brotherhood, students will serve the society and industry in better way with teamwork and thus grow professionally.
	18.Organizational Behavior	CO1 Describe and apply motivation theories to team and organizational scenarios in order achieve a team's or an organization's goals and objectives.
		CO2 Explain the effect of personality, attitudes, perceptions and attributions on their own and other's behaviors in team and organizational settings.
		CO3 Explain types of teams and apply team development, team effectiveness, and group decision making models and techniques. Analyse and apply leadership theories and better understand their own leadership style.
	19.Development of Cardiovascular system: Fetal& Neonatal	CO1 This course will provide overall information of the structural development of the cardiovascular system.
		CO2To encourage student to apply this knowledge to understand developmental anomalies in Cardiovascular System.

	20.Cardiovascular Diseases Pertinent to Cardiac Care Technology	CO1 This course will cover common Cardiovascular Diseases, their related pathology and microbiology.
		CO2 Along with outline of clinical presentation and management of these conditions it also includes Medical and Surgical interventions.
	21.Medical Instrumentation relevant to Cardiac Care	CO1 The course is designed to make the student acquire an adequate knowledge of the physiological systems of the human body and relate them to the parameters that have clinical importance.
		CO2 The fundamental principles of equipment that are actually in use at the present day are introduced.
		CO3 To train the student in various recording techniques of the machines which will increase their efficiency in the healthcare industry or they will be the best helping hand for biomedical engineers.
	22.Computer and Applications	CO1 Discuss about health informatics and different IT applications in allied health care.
		CO2 Explain the function of Hospital Information Systems
		CO3Analyze medical standards
	23.Biostatistics and Research Methodology	CO1 To understand the importance & Methodology for research
		CO2 To learn in detail about sampling, probability and sampling distribution, significance tests correlation and regression, sample size determination, study design and multivariate analysis.
	24.Advanced Electrocardiography	CO1 To develop an understanding regarding Echocardiography.
		CO2 To train students to perform Echocardiography examinations by explaining the position of transducers.
		CO3 To make students aware of recent advances in Echocardiography.
		CO4 To understand the role of Cardiac Care technician while assisting the Cardiologist as well as when performing individually.

	25.Advanced Echocardiography	CO1 To develop an understanding regarding Echocardiography.
		CO2 To train students to perform Echocardiography examinations by explaining the position of transducers.
		CO3 To make students aware of recent advances in Echocardiography.
		CO4 To understand the role of Cardiac Care technician while assisting the Cardiologist as well as when performing individually.
	26.Invasive Cardiology	CO1 To enable students to not only be a helping hand to those just starting out in the specialty but also to serve as a reference for those who have been working in Invasive field for some time
B.Optomety B.Sc. OT & AT B.Sc. Cardiac Technology B.Sc. Medical Imaging Technology B.Sc. Medical Laboratory Technology (Academic year 2018-19)	27.Basics of Clinical Skill Learning	CO1 After successful accomplishment of the course, the students would be able to Measure Vital Signs, do basic physical Examination of the patients, NG tube basics, Administration of Medicines
		CO2 The students will learn about Asepsis, and the Cleanliness related to asepsis and on mobility of the patients
	28.Hospital Operation Management	CO1 Understand and apply resource management concepts (personnel, finance, and material resources) and the processes and strategies needed in specific hospital sectors
		CO2 Communicate effectively and develop their leadership and teambuilding abilities
		CO3 Apply modern change management and innovation management concepts to optimize structures
		CO4 Analyze existing hospital service policies and enhance their alignment within the local and national context
	29.Cardiac Catheterization	CO1 The students will gain knowledge about chances of a successful procedure.
		CO2 To enable students, understand about benefit/risk to the patient if the procedure is successful/ unsuccessful

		CO3 The occurrence and management of various complications.
	30.Pediatric Interventions	CO1 The students will gain knowledge through proper assessment and integration of the history, physical examination, electrocardiogram, and chest X-ray, the type of problem can be diagnosed correctly in many patients, and the severity and hemodynamics correctly estimated.
		CO2 The occurrence and management of various complications in Pediatric cardiology interventions
B.Sc. Medical Radiology & Imaging Technology	40.Physics for Medical Imaging - 1	CO1 After successful accomplishment of the course, the students would be able to describe the applied physics and correlate it with technical procedures. Students should understand Concepts of Physics to be applied for learning various Imaging Modalities.
		CO2 The student must able to correlate the knowledge with the technical procedures.
	41.Radiographic Techniques – 1	CO1 The students will be able to know the normal structure of the skeletal system and be able to correlate the abnormalities in diseases.
		CO2 The students will be able to diagnose abnormalities, diseases, physiological and pathological conditions on X-rays.
	42.Dark Room Techniques	CO1 The students would be able to understand image processing and understand the concepts.
	43.Physics for Medical Imaging Technology – 2	CO1 After successful accomplishment of the course, the students would be able to describe the applied physics and correlate it with technical procedures. Students should understand Concepts of Physics to be applied for learning various Imaging Modalities.
		CO2 The student must able to correlate the knowledge with the technical procedures.
	44.Radiographic Techniques – 2	CO1 The students will be able to know the normal structure of the skeletal system and be able to correlate the abnormalities in diseased.

		CO2 The students will be able to diagnose abnormalities, diseases, physiological and pathological conditions on X-rays.
	45.Digital Imaging	CO1 The Students will know about Post processing Techniques in imaging technology.
		CO2 They will know about Radiological Information Systems and Hospital Information Systems.
		CO3 They will know about Digital Radiography.
	46.Advanced Radiographic Techniques	CO1 The student will be able to identify the anatomy to be imaged
		CO2 The student would learn how to give proper positioning to the patient for the imaging
		CO3 The student will be able to probe the patient properly to give proper projection/projections
		CO4 Use of proper radiographic exposures to get proper x-rays
		CO5 He will be able to know how to handle the patients in the ICU, Ward OT and to use special techniques to the imaging.
	47.Equipment for Medical Imaging	CO1 After successful accomplishment of the course, the students would be able to describe the applied physics and correlate it with technical procedures. Students should understand Concepts of Physics to be applied for learning various Imaging Modalities.
		CO2 The student must able to correlate the knowledge with the technical procedures
	48.Special Procedures in Medical Imaging	CO1 After successful accomplishment of the course, the Students will know about the procedures performed in Interventional Radiology and in Fluoroscopy.
		CO2 The Procedures such as RGU, MCU, IVU, PTBD, ERCP, IPTC Etc
	49.Quality Assurance in Medical Imaging	CO1 After successful accomplishment of the course, the students would be able to do quality assurance of the machines and the Equipment.

		CO2 The student must able to correlate the knowledge with the technical procedures.
	50.Modern Technologies in Imaging	CO1 After successful accomplishment of the course, the students would be able to describe the applied physics and correlate it with technical procedures. Students should understand Concepts of Physics to be applied for learning various Imaging Modalities.
		CO2 The student must able to correlate the knowledge with the technical procedures
	51.Radiation Physics and Radiation Protection	CO1 This will make the students aware about the Safety required in the Radiology Dept.
		CO2 This Subject will teach them about the Dose limits required for the Patients and the Technologist.
B.Sc. Medical Laboratory Technology	61.Fundamental of Biochemistry – I	CO1 Students will have knowledge about various glassware, equipments.
		CO2 Students will be able to prepare percent, normal, molar solutions.
		CO3 Analytical skill for examination of body fluids, blood pH and electrolytes.
	62.Fundamentals of Microbiology-I	CO1 Theory and Lab courses provide the student with the study of normal flora and pathogenic microorganisms. Methods for recovery, identification of pathogens, culture techniques, procedures, and antibiotic testing and sterilization techniques.
		CO2 Get an idea of universal safety precautions.
	63.Hematology and Clinical Pathology – I	CO1 At the end of the semester the student should be know the basic concepts in hematology and clinical pathology
		CO2 He should be able to collect blood under guidance
		CO3 Should perform urine experiments under guidance
	64.Fundamental of Biochemistry - II	CO1 Students will basic knowledge about internal quality control system and its use in elimination of error in clinical laboratory.

		CO2 Students will have adequate knowledge about various body fluids with the composition and its importance in diagnosis of different disease condition.
		CO3 They will understand mechanism underlying blood ph regulation with abnormal conditions associated.
	65.Fundamentals of Microbiology-II	CO1 This part is designed to study the details of systemic bacteriology including its morphology, species, lab diagnosis, isolation and identification.
		CO2 The knowledge of related diseases with its brief clinical features will be gained.
	66.Hematology and Clinical Pathology – II	CO1 Students will have knowledge about various glassware, equipments.
		CO2 Students will be able to prepare percent, normal, molar solutions
		CO3 Analytical skill for examination of body fluids, blood pH and electrolytes.
	67.Clinical Biochemistry – I	CO1 Students will have skills to perform various diagnostic profiles, operation of Lab information systems and Reporting.
		CO2 Students will be able to provide accurate laboratory results in a timely manner as well as safeguard experimental controls, calibrate laboratory instruments.
	68.Medical Microbiology-I	CO1 Theory and Lab courses provide the student with an introduction to basic laboratory identification and classification of medically significant isolates in mycology, parasitology.
		CO2 Laboratory safety, specimen selection and processing, isolation methods, immunologic diagnosis and treatment.
		CO3 Epidemiology and pathogenesis of mycosis, parasitic and infections are explored
	69.Blood Bank and General Pathology – I	CO1 The student should be able to apply the basic knowledge of hematology, histopathology, and cytology in laboratory
		CO2 The student should perform the techniques and staining procedure in histopathology and cytology

		CO3 The student should be able to apply the basics of hematology and clinical pathology learnt in 3rd and 4th semester in clinical laboratory.
	70.Clinical Biochemistry - II	CO1 Students will have skills to perform various diagnostic profiles, operation of Lab information systems and Reporting.
		CO2 Students will be able to provide accurate laboratory results in a timely manner as well as safeguard experimental controls, calibrate laboratory instruments.
	71.Medical Microbiology-II	CO1 The main aim of this course is to train students in the field of Medical Microbiology.
		CO2 Theoretical as well as practical training is imparted to the students in various branches of Microbiology namely Bacteriology, Virology, and Parasitology, Immunology, serology and Mycology so that they can participate in good patient care and prevention of infectious diseases in the community.
		CO3 They are introduced to basic and advanced methods used in the field of diagnostic Microbiology.
	72.Blood Bank and General Pathology – II	CO1 The student be well versed with the techniques in blood banking like components and FDA regulations
		CO2 The B.Sc graduate should have sound knowledge and basic skills of working in a pathology lab and blood bank
B.Optomety	82.Physical Optics	CO1 This course will be taught in one semester. Physical Optics is the study of light, its properties and its interaction with matter. Specifically, the phenomena of interference, diffraction, polarization and scattering will be dealt with in detail.

	83.Geometrical Optics	<p>CO1 This course will be taught in two consecutive semesters. Geometric Optics is the study of light and its behavior as it propagates in a variety of media. Specifically, the phenomena of reflection and refraction of light at boundaries between media and subsequent image formation will be dealt with in detail. Reflections at plane and spherical surfaces and refractions at plane, spherical, cylindrical and toric surfaces will be studied in this course. Attention will be given to the system of surfaces and/or lenses and their imaging properties. The effect of aperture stops on the quality of images, such as blur and aberrations, depth of field and depth of focus, will also be studied.</p>
	84.Visual Optics I/II	<p>CO2 This course deals with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.</p>
	85.Ocular Diseases I	<p>CO1 This course deals with various ocular diseases affecting various parts of the eyes. It covers clinical signs and symptoms, cause, pathophysiological mechanism, diagnostic approach, differential diagnosis and management aspects of the ocular diseases.</p>
	86.Clinical Examinations and Visual Systems	<p>CO1 This course deals with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.</p>
	87.Optometric Optics I & II	<p>CO1 This course deals with understanding the theory behind spectacle lenses and frames, their materials, types, advantages and disadvantages, calculations involved, when and how to prescribe. It will impart construction, design application and development of lenses, particularly of the methods of calculating their power and effect.</p>

	88.Ocular Diseases II & Glaucoma	CO1 This course deals with the concept of eye as an optical instrument and thereby covers different optical components of eye, types of refractive errors, clinical approach in diagnosis and management of various types of refractive errors.
	89.Dispensing Optics	Skills to be acquired at the end of this course
		CO1 Reading of spectacle prescription
		CO2 Counseling the patient
		CO3 Lens edge thickness calculation
		CO4 Frame & lens measurements and selection
		CO5 Writing spectacle lens order
		CO6 Facial measurements - Interpupillary distance measurement and measuring heights (single vision, multifocal, progressives)
		CO7 Lens verification and axis marking and fitting of all lens types
		CO8 Final checking of finished spectacle with frame adjustments
		CO9 Delivery and follow-up
		CO10 Troubleshooting complaints and handling patient's questions.
	90.Optometric Instrumentation	CO1 This course covers commonly used optometric instruments, its basic principle, description and usage in clinical practice.
	91.Basic & Ocular Pharmacology	CO1 This course covers the actions, uses, adverse effects and mode of administration of drugs, especially related to eyes.
	92.Contact Lenses I	CO1 Following completion of the programme an optometrist will be able to demonstrate:
		CO2 A detailed knowledge of lens design and manufacture for RGP including verification.
		CO3 An ability to fit and assess a range of RGP lens designs
		CO4 An ability to fit a range contact lenses to correct regular and irregular astigmatism, such as early keratoconus
		CO5 An ability to fit a range of contact lenses to correct presbyopia

		CO6 An ability to provide ongoing management and advice for maintaining healthy contact lens wear
		CO7 An ability to detect, assess and manage the impact of contact lens complications on the anterior eye
		CO8 An ability to produce a comprehensive contact lens record
		CO9 An ability to communicate effectively with contact lens patients, fellow professionals and contact lens manufacturers and suppliers
	93.Binocular Vision I & II	On successful completion of this module, a student will be expected to be able to:-
		CO1 Demonstrate an in-depth knowledge of the gross anatomy and physiology relating to the extraocular muscles.
		CO2 Provide a detailed explanation of, and differentiate between the etiology, investigation and management of binocular vision anomalies.
		CO3 Adapt skills and interpret clinical results following investigation of binocular vision anomalies appropriately and safely.
		CO4 Ability to independently investigate and diagnose case of strabismus with comments in respect to retinal correspondence and binocular single vision.
		CO5 Ability to perform all the investigations to check retinal correspondence, state of Binocular Single Vision, angle of deviation and special investigations for paralytic strabismus.
	94.Low Vision Aids	
		CO1 An understanding of the terminology used to describe low vision and visual impairment
		CO2 An understanding of the epidemiology and demography of low vision in India
		CO3 An understanding of the impact of low vision, including emotional impact, on an individual and their community
		CO4 Ability to assess people with low vision

		CO5 Ability to determine magnification requirements and to prescribe, dispense and train in the use of electronic and optical low vision task appropriate devices
		CO6 Ability to prescribe appropriate functional adaptive devices
		Ability to establish effective communication with individuals, their family, careers and with other organizations and professionals.
	95.Systemic Diseases	CO1 To have an understanding of various systemic diseases that all affect the eyes
		CO2 To have an understanding of the ocular side effects of various drugs that are used to manage or treat systemic diseases
		CO3 To understand the role of an optometrists for co management of an systemic diseases with other health care professionals
	96.Contact Lenses II	CO1 To have a detailed knowledge of lens design and manufacture for SCL including verification.
		CO2 To be able to fit and assess a range of SCL lens designs
		CO3 To be able to fit a range of contact lenses to correct presbyopia
		CO4 To be able to provide ongoing management and advice for maintaining healthy contact lens wear
		CO5 To be able to detect, assess and manage the impact of SCL contact lens complications on the anterior eye.
		CO6 To be able to produce a comprehensive contact lens record.
		CO7 To be able to communicate effectively with contact lens patients, fellow professionals and contact lens manufacturers and suppliers
	97.Sports Vision	CO1 To understand visual demands for various kinds of sports for athletes
		CO2 To perform a comprehensive sports vision assessment for athletes
		CO3 To be able prescribe vision correction appropriate to address the visual demands for sport activity

		CO4 To be able to prescribe vision training and protective devices to minimize ocular trauma due to sports.
	98.Pediatric and Geriatric Optometry	CO1 To have a knowledge of the principal theories of childhood development, and visual development
		CO2 To have the ability to take a thorough geriatric history, and pediatric history which encompasses the relevant developmental, visual, medical and educational issues
		CO3 To be able to identify visual and ocular problems in children and the elderly by collecting relevant clinical information
		CO4 To be able to perform appropriate assessment and management of accommodative-vergence system, types of ametropia, accommodation and vergence disorders.
		CO5 To be familiar with the aetiology, clinical presentation and treatment of amblyopia, comitant strabismus and commonly presenting incomitant strabismus
		CO6 Manage visual / ocular disability with appropriate optical treatments, low vision aids and referral
		CO7 Communicate effectively with the pediatric and geriatric patients and their attendees.
		CO8 Communicate professionally with other health care professionals in terms of accurate presentation of patients' symptoms, critical analysis of clinical findings and suitable plan of action
		CO9 Recognize the professional responsibility and need of life-long learning in geriatric and pediatric eye care.
	99.Occupational Optometry	CO1 To be able to apply different types of protocols for doing a right clinical history according to the patient profile and its context (workplace, free activities, etc).
		CO2 To be able to know the functional limits of human vision and its relationship with age, as well as at occupational contexts and free activities, linking with the task visibility factors.

		CO3 To acquire ability for examining, give diagnosis, and manage visual anomalies, with special relevance in the differential diagnosis related with occupational and free activity contexts.
		CO4 To be able to evaluate eye hazards in occupational or free-time activities under radiant energy exposures, as well as continuous light sources such as laser, and understand their controls for avoiding eye injuries.
		CO5 To be able to identify and analyze environmental and occupational hazards causing eye injuries (mechanic, chemical, electric, etc).
		CO6 To acquire ability for evaluating the visual performance of any patient and propose appropriate optical prescription, environment design, visual therapy, etc
		CO7 To be able to communicate and inform to patient about all tests and instructions to be applied on him/her clearly explaining the final results and their diagnosis.
		CO8 To know and locate the international and national standards related to visual and eye health in each context.
B.Sc. Operation Theater& Anesthesia Technology	127.Introduction To Operation Theatre Technology (OT)	CO1 Demonstrate ability to prepare and maintain Operation Theater
		Able to identify and move to maintain a sterile field
		Manage and maintain theatre equipments
	128.Introduction to Anesthesia Technology (AT)	CO1 Suggesting a simple anesthetic plan commonly used anesthesia non- invasive
		CO2 Monitoring in the Operation Theatre
	129.Principles Of Anesthesia	CO1 Students understand the Basic anaesthetic equipment the working principle of the AT equipment
		CO2 Able to Monitor the physiological parameters
	130.Basic Techniques of Anesthesia	CO1 Student learns the rational use selection of regional anaesthesia techniques and the choice of local anaesthesia.

		CO2 Incorporates Basic understanding of immediate in preoperative patient management.
		CO3 Performs skills for Management of patients in post-anesthesia recovery room
	131. Medical Diseases Influencing Choice of Anesthesia	CO1 Students understand the apply the knowledge related to drugs, calculations of anesthetic medications in different cardiovascular, respiratory and renal diseases.
	132. Medicine Relevant To Operation Theatre Technology	CO1 Students know thoroughly the medicines relevant to OT such Antisialagogues, Sedatives, Anxiolytics and Narcotics understand the use of muscle relaxant and Local Anaesthetics commonly used in OT have knowledge and use of Emergency medicines
	133. Basics of Surgical Procedures	CO1 Able to assist anesthesiologists in pre-operative, surgical theater, recovery room, and post-operative intensive care procedures in both minor and major surgeries.
	134. CSSD procedures	CO1 Able to manage Central sterile supply department.
		CO2 Show efficiency in methods of sterilization
		CO3 Independently demonstrated skills of disinfection and sterilization
		CO4 Verbalizes methods and prevention of infection
	135. Advance Anesthesia Techniques	CO1 Able to assist anaesthesiologists in advanced anaesthesia procedures such as artificial ventilation and cardiopulmonary bypass.
	136. Basic Intensive Care	CO1 Should be able to demonstrate all the basic intensive care required at
		operation theatre and in handling patient in crisis
	137. Specialized Surgery and Anesthesia	CO1 Able to help the anaesthesiologist in administering anaesthesia, assist in various procedures and also help in continuous monitoring of patients during surgery.
	138. Electronics and Technology in Surgery and Anesthesia	CO1 Knowable about Basic electronics, basic principle, care and maintenance of machine at OT.

		CO2 Able to manage Indenting, Record keeping and inventory maintenance
B.Sc. Medical Dialysis Technology	Introduction to Dialysis	<ul style="list-style-type: none"> • Practice personal safety & standard precautions.
		<ul style="list-style-type: none"> • Handling complications during dialysis procedures.
		<ul style="list-style-type: none"> • Understand Infectious diseases, mode of transmission, prevention & care
		of the patient in a Dialysis Unit.
	Fundamentals of Dialysis	<ul style="list-style-type: none"> • Practice personal safety & standard precautions.
		<ul style="list-style-type: none"> • Handling complications during dialysis procedures.
		<ul style="list-style-type: none"> • Understand Infectious diseases, mode of transmission, prevention & care
		of the patient in a Dialysis Unit.
	Pharmacology in Dialysis	<ul style="list-style-type: none"> • Understand the basic concepts of pharmacology
		<ul style="list-style-type: none"> • Understand the pharmacology of common chemotherapeutics.
		<ul style="list-style-type: none"> • Understand common antiseptics, disinfectants and insecticides.
		<ul style="list-style-type: none"> • Understand drug acting on various systems of human body.
		<ul style="list-style-type: none"> • Understand alternative systems of medicines.
	Concept of Renal Disease & Disorders	<ul style="list-style-type: none"> •To develop understanding regarding different disorder and its management.
		<ul style="list-style-type: none"> •To develop knowledge in childhood anomalies' and it's significance.
	Nutrition in Dialysis	<ul style="list-style-type: none"> • To describe basic nutrient and their role in growth, development, health
		maintained and restoration.
		<ul style="list-style-type: none"> • To identify and interpret appropriate dietary plan for dialysis patient.
	Applied Dialysis Technology – I	<ul style="list-style-type: none"> • Know the History
		<ul style="list-style-type: none"> • Describes the anatomy and Physiology
		<ul style="list-style-type: none"> • Performs Physiological principles of Dialysis
		<ul style="list-style-type: none"> • Demonstrated Procedures as Venepuncture, Cannulisation and
		maintenance of Sterilization of Equipment's and Dialysis Unit
		<ul style="list-style-type: none"> • Demonstrate maintenance of Records and Reports .

	Advance Dialysis Technology – I	Practice and perform independently the water maintenance for the
		Hemodialysis room
		•Independently maintain the Hemodialysis machine with respect to
		disinfection and priming.
	Applied Dialysis Technology II	• Train patients in performing peritoneal dialysis, and personal care.
		• Practice personal safety & standard precautions.
		• Handling complications during dialysis procedures.
		• Maintain quality and safety
	Advance Dialysis Technology II	• Demonstrate Knowledge about Advancements in Renal Dialysis and in
		renal therapies
		• Demonstrate peritoneal dialysis, and its self care
		• Involves family centered approach while providing patient care
		• Handling complications during dialysis procedures.
B.Sc. Perfusion Technology	Applied Pharmacology	Students will be proficient in Pharmacology with proficient knowledge
		about the different drugs / medicines to be given in various cardiovascular
		diseases, dose calculation and mode of administration.
		Also recent advances in pharmacology will play a key role in research
		aspect of the students.
	Applied Anatomy & Physiology of Cardiovascular system related to PT	Students will be able to identify normal anatomy and vasculature and also
		be familiar with the pathologically diseased conditioned organs and
		changes in hemodynamics
	Basics of Perfusion Technology	Students will understand the use of equipments in CPB and also hand on
		training with the equipments and materials used
		Students will be able to understand the principles and use of all the
		equipments and its making
	Applied Physiology and Biochemistry	At the end of this semester students will be able to evaluate, diagnose and

		help in treating the patients and differentiate patients eligible for taking for
		surgery or to be given mediational treatment
	Introduction of Perfusion Techniques	Students will be able to collect the data before and at the time of surgery
		for equipment evaluation
	Perfusion Technology: Clinical	<ul style="list-style-type: none"> • To learn the pharmacokinetics and pharmacodynamics during cardiopulmonary bypass
		<ul style="list-style-type: none"> • Dealing with conduction and termination of cardiopulmonary
		bypass and problems associated with it
	Perfusion Technology: Applied	<ul style="list-style-type: none"> • Techniques that can minimise the ill effects of the machinery and to
		improve patient outcome and the activated systemic inflammatory
		response system
	Perfusion Technology : Advanced	<ul style="list-style-type: none"> • Use of machinery and amenities during emergency cases and
		conditions
		<ul style="list-style-type: none"> • Management of complications related to bypass and advanced extra
		corporeal life support
		<ul style="list-style-type: none"> • Team management of perfusion accidents and management
	Recent advances in Cardiopulmonary bypass & Perfusion	<ul style="list-style-type: none"> •The students will gain knowledge about chances of a successful procedure.
		<ul style="list-style-type: none"> •To enable students, understand about benefit/risk to the patient if the procedure is successful/ unsuccessful
		<ul style="list-style-type: none"> •The occurrence and management of various complications.
M.Sc. Medical Radiology & Imaging Technology	100.Conventional Radiology and Imaging Equipment	CO1 After successful accomplishment of the course, the students would be able to describe the applied physics and correlate it with technical procedures. Students should understand Concepts of Physics to be applied for learning various Imaging Modalities.
		CO2 The student must able to correlate the knowledge with the technical procedures

	101.Modern Radiological and Imaging Equipment	CO1 After successful accomplishment of the course, the students would be able to describe the applied physics and correlate it with technical procedures.
		CO2 The student must able to correlate the knowledge with the technical procedures
	102.Radiation Safety and Protection	CO1 This will make the students aware about the Safety required in the Radiology Dept.
		CO2 This Subject will teach them about the Dose limits required for the Patients and the Technologist.
	103.Radiographic and Imaging Techniques	CO1 The students will be able to know the normal structure of the skeletal system and be able to correlate the abnormalities in diseased.
		CO2 The students will be able to diagnose abnormalities, diseases, physiological and pathological conditions on X-rays.
	104.Interventional Radiological Techniques	CO1 The students will be able to help the doctors in the interventional procedure
		CO2 They will be able to guide in the procedures for the doctors and will learn on the catheters and their types and will be able to know about the different procedures,
	105.Radiological Physics for Imaging	CO1 After successful accomplishment of the course, the students would be able to describe the applied physics and correlate it with technical procedures. Students should understand Concepts of Physics to be applied for learning various Imaging Modalities.
		CO2 The student must able to correlate the knowledge with the technical procedures
	Radiological & Imaging Procedures	CO1 After successful accomplishment of the course, the Students will
		know about the procedures performed in Interventional Radiology
		and in Fluoroscopy.
		CO2The Procedures such as RGU, MCU, IVU, PTBD, ERCP, IPTC Etc
	Quality Assurance in Diagnostic Imaging	CO1 After successful accomplishment of the course, the students would

		be able to do quality assurance of the machines and the Equipment.
		CO2 The student must able to correlate the knowledge with the technical
		procedures.
M.Sc. Cardiac Care Technology	106.Introduction to Clinical Cardiology	CO1 To develop an understanding regarding Echocardiography.
		CO2 To train students to perform Echocardiography examinations by explaining the position of transducers.
		CO3 To make students aware of recent advances in Echocardiography.
		CO4 To understand the role of Cardiac Care technician while assisting the Cardiologist as well as when performing individually.
	107.Fundamentals of Cardiac diagnostic procedures and Investigations	CO1 To educate and train students to understand, interpret and commission basic and complex diagnostic cardiac investigations.
	108.Introduction to Pacing and Electrophysiology Study Techniques	CO1 Identify indications for cardiac pacing based on international guidelines
		CO2 Identify indications for electrophysiological studies with/ without ablation in cases of complex arrhythmias.
	109.Introduction to Non-Invasive Techniques in Cardiology	CO1 Identify indications for non-invasive techniques based on international guidelines
		CO2 Identify indications for non-invasive techniques.
	110Invasive Cardiology	CO1 To enable students to not only be a helping hand to those just starting out in the specialty but also to serve as a reference for those who have been working in Invasive field for some time
	Echocardiography-Advanced	Co1 To develop an understanding regarding Echocardiography.
		Co2 To train students to perform Echocardiography examinations by explaining the position of transducers.
		Co 3To make students aware of recent advances in Echocardiography.
		CO 4To understand the role of Cardiac Care technician while assisting the

		Cardiologist as well as when performing individually.
	Quality Assurance, Standardization & Accreditation (Cardiac Care)	Students will learn the concept of Quality Assurance and its applications.
		CO 1 To understand, implement and follow standard methods of Quality Assurance
M. Optometry	111. Epidemiology Public health & Community Eye Health	CO1 To have a thorough understanding of epidemiological concepts.
		CO2 To have a thorough understanding of conducting of screening for specific eye conditions, and resultant implications through theoretical and practical exposure
		CO3 To understand role of optometrists in community eye health
	112. Ocular Diseases	CO1 A-Scan OCT UBM ,
		CO2 To be able to interpret glaucoma diagnostic reports OCT, HRT, Gonioscopy, and ONH evaluation.
	113. Anterior Segment Diagnostic	CO1 To be able to perform clinical decision making for Ocular abnormalities
		CO2 To be able to perform and interpret corneal diagnostics including, Topography/Pentacam/Orbscan, Secular microscopy, Tachymetry, Abberometry, A-Scan OCT UBM ,
		CO3 To be able to interpret glaucoma diagnostic reports OCT, HRT, Gonioscopy, and ONH evaluation.
		CO4 To be able to perform anterior segment photography
		and ophthalmic imaging
		CO5 To be able to manage and co-manage therapeutics for anterior segment
	114. Ocular Diseases and Diagnostics II	CO1 To be able to perform electro diagnostic procedures and interpret electro diagnostic reports ,ERG, EOG and VEP
		CO2 To be able to perform stereoscopic fundus photography
		CO3 To be able to use Ocular photography as a tool for evidence based clinical decision making and progression analysis

		CO4 To be able to perform posterior segment photography
		CO5 To be able to manage and co-manage diseases and disorders of posterior segment
	115.Advanced Contact Lenses I	CO1 To be able to understand corneal physiology and oxygen needs
		CO2 To be able to diagnose and manage complications due to contact lenses
		CO3 To be able to fit specialized contact lenses
		CO4 To be able to manage Keratoconus with different lens designs
		CO5 To be able fit Rose'K lenses
		CO6 To be able fit Mini scleral lenses
	116.Binocular Vision and Pediatric Optometry	CO1 To be able to diagnose and manage and co-manage binocular vision anomalies
		CO2 To be able to co-manage visual perceptual anomalies
		CO3 To be able to manage diplopia, suppression and ARC
		CO4 To be able to manage amblyopia
	117.Low vision and Geriatric Optometry	CO1 To be able to diagnose and manage patients with vision impairment
		CO2 To be able to perform specialized diagnostics , Rudimentary vision , Berkeley visual field test , Hand disc perimetry
		CO3 To be able to train for eccentric viewing and steady eye techniques
		CO4 To be able to diagnose and manage patients with vision impairment
		CO5 To be able to perform specialized diagnostics for patients with low vision with multiple disabilities
		CO6 To be able to train for eccentric viewing and steady eye techniques
		CO7 To be able to rehabilitate patients with VI with vocational counseling and activities of daily living
	Advanced Dispensing Optics	Upon completion, students should be able to design and dispense
		appropriate eyewear for a variety of patients.
	Advanced Contact Lenses II	To be able to fit specialized contact lenses

		Keratoconus , Rose'K lenses,Mini scleral lenses
		Hybrid lenses,Orthokeratology,Scleral lenses: Dry eyes, SJS, Post PK, Post
		C3R, Post LASIK ectasia. Ability to fit custom made ocular prosthesis,
		Ability to fit pediatric contact lenses
	Visual Perception, Neuroscience and Psychophysics	To be able to diagnose and manage patients with neuro- optometric
		• To be able to provide therapy for rehabilitation and treatment.
	Applied Vision Therapy	Principles and Procedures – The student should be able to define and
		explain:
		1. The unique qualities, scientific, and clinical principles of each clinical
		condition.
		2. The epidemiological and demographic characteristics of each clinical
		condition.
		3. The characteristic history, signs and symptoms for each clinical condition.
		4. How to assess each clinical condition, including specific test protocols
		and their interpretation.
		5. The differential diagnosis for each clinical condition.
		6. The specific treatment and management of each clinical condition
		including: 6.1 Prognostic indicators 6.2 Treatment options 6.3 Duration
		and frequency of treatment 6.4 Treatment philosophy and goals 6.5
		Specific lens treatment and therapy procedures including rationale for
		treatment 6.6 Ergonomics and visual hygiene 6.7 Outcomes to determine
		successful completion of treatment 6.8 Frequency of follow-up care and
		patient instructions 6.9 Referral criteria (medical, neurological,
		educational, etc.)

	Basics of Clinical Skill Learning	After successful accomplishment of the course, the students would be
		able to Measure Vital Signs, do basic physical Examination of the
		patients, NG tube basics, Administration of Medicines
		• The students will learn about Asepsis, and the Cleanliness related to
		asepsis and on mobility of the patients
	Hospital Operation Management	Understand and apply resource management concepts (personnel,
		finance, and material resources) and the processes and strategies
		needed in specific hospital sectors
		• Communicate effectively and develop their leadership and
		teambuilding abilities
		• Apply modern change management and innovation management
		concepts to optimize structures
		• Analyze existing hospital service policies and enhance their alignment
		within the local and national context
	Research Methodology & Biostatistics	Student will be able to understand develop statistical models,
		research designs with the understating of background theory of various
		commonly used statistical techniques as well as analysis interpretation &
		reporting of results and use of statistical software.



Dr. Rajesh B. Goel
Registrar

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