1. Master of Medical Radiology and Imaging Technology

Unit	Topic Area	Detailed Syllabus
1	**RADIATION PHYSICS**	**Structure of X-ray tube:** Cathode (filament, focusing cup), Anode (stationary and rotating anode, target materials), Thermionic emission, Electron acceleration and target interaction Types of X-ray production: Bremsstrahlung radiation, Characteristic radiation Line focus principle, Heel effect, Beam characteristics, Filtration (inherent and added) and Collimation Interaction of Radiation with Matter and Radiation Units and Measurements
2	**RADIOGRAPHIC TECHNIQUES**	**Positioning:** Anatomical planes and terminology, Principles of patient positioning, Alignment of X-ray tube, patient, and image receptor **Standard radiographic positions:** Chest (PA, AP), Skull (AP, lateral), Spine (cervical, thoracic, lumbar), Abdomen (erect, supine) Immobilization techniques, Trauma positioning considerations **Exposure Factors:** Inverse square law, Grid **Image Quality:** Radiographic density, Contrast (short scale, long scale), Spatial resolution, Noise, Distortion, Artifacts
3	**IMAGING MODALITIES**	**Conventional Radiography:** Principles of image formation, Film-screen radiography, Computed radiography (CR), Digital radiography (DR), Advantages and limitations **Computed Tomography (CT):** Principle of CT imaging, Equipment, Image reconstruction techniques, Spiral CT and Multidetector CT **Magnetic Resonance Imaging (MRI):** Basic principle of nuclear magnetic resonance, Equipment, Basic imaging sequences, Contraindications and safety considerations **Ultrasonography:** Piezoelectric effect, Types of transducers, Modes, Common artifacts **Nuclear Medicine:** Principles of radioactive decay, Radioisotopes used in imaging, Gamma camera, PET and SPECT basics
4	**RADIATION PROTECTION**	**Principles of Radiation Protection:** ALARA principle, Time, distance, and shielding concept, Dose Limits **Shielding:** Personal protective devices, Structural shielding, Protective barriers **Radiation Monitoring:** Film badge, Thermoluminescent dosimeter (TLD), Pocket dosimeter
5	**CONTRAST MEDIA**	**Types of Contrast Media:** Iodinated contrast media, Barium sulfate, Gadolinium-based contrast **Indications:** CT imaging, Angiography, Gastrointestinal studies **Adverse Reactions:** Mild reactions, Moderate reactions, Severe reactions **Complications:** Contrast-induced nephropathy, Hypersensitivity reactions

6	**EQUIPMENT AND INSTRUMENTATION**	**X-ray Equipment:** X-ray tube components, Control panel, Heat dissipation mechanisms **CT Equipment:** Gantry system, Slip ring technology, Detector systems **MRI Equipment:** Types of magnets, RF coils, Safety zones, Quench system
7	**PATIENT CARE AND SAFETY**	**Basic Life Support:** Cardiopulmonary resuscitation (CPR), Airway, breathing, circulation (ABC) **Patient Positioning and Handling:** General patient care, Trauma patient management, Pediatric and geriatric considerations

2. Master of Medical Laboratory Science (MMLS)

Unit	Topic Area	Detailed Syllabus
1	**Hematology and Pathology**	• Haematopoiesis, Blood composition and function of normal cellular components. • Erythrocytes: Normal and Abnormal RBC Structures, Function, and Fate of Erythrocytes along with Clinical Indications of Jaundice, Normal Range. • Hemoglobin: Structure, composition and function, synthesis and regulation of hemoglobin • Leucocytes: Structure, functions, normal range, lifespan of normal White Blood Cells • Thrombocytes: Structure, functions, normal range, lifespan of normal Platelets. • Normal hemostasis and physiological properties of coagulation factors. Primary, secondary and tertiary hemostasis. Role of the platelets, coagulation factors, coagulation inhibitory system and fibrinolysis. • Anticoagulants: types, mode of action and preference of anticoagulants for different haematological studies. Different types of blood collection, including the preservation of blood samples for various haematological investigations. • Anaemia: Morphological and etiological classification: Signs, symptoms, aetiology, pathophysiology, and laboratory findings associated with Iron deficiency anaemia, Megaloblastic anaemia, Aplastic anaemia, Hemolytic anaemia, Thalassemia, Sickle cell anaemia, Hereditary spherocytosis • Leukaemia: Classification, definition and clinical implications, Pathophysiology, signs, symptoms, and laboratory diagnosis • Coagulation pathways • Cytogenetics, Karyotyping, FISH, Basics of Flow Cytometry • ABO blood group system and variants • Formation and Normal Composition of urine, Indication of urine analysis, collection of urine, preservatives used for urine sample, examination of urine • Physical, chemical and microscopic faecal analysis • Physical and chemical characteristics and analysis of sperm and Sputum
2	**Microbiology**	• Microscopy: Light Microscopy, Bright-field microscopy, Dark-ground microscopy, Phase-contrast microscopy, Fluorescence microscopy, Electron microscopy • Bacteria: Morphology, size, arrangement, Anatomy of the bacterial cell - structure, function, and clinical significance of - Cell wall, Cell membrane, Cell surface appendages, Bacterial Capsule, Cell organelles, plasmid, Spore. • Principles of staining - Simple staining, Negative staining, • Culture Media and Methods: Culture Media- common ingredients of culture media, classification of media. Culture Methods- Methods of bacterial culture, aerobic culture, anaerobic culture, methods of anaerobiosis.

		• Gram-positive bacteria: Staphylococcus species, Streptococcus species, Bacillus species • Mycobacteria: Classification and morphology • Anaerobes: Non-spore-forming anaerobes. Classify anaerobes, infections caused, and laboratory diagnosis • Gram Negative Cocci: Neisseria meningitidis, Neisseria gonorrhoeae • Vibrio species, Pseudomonas and Burkholderia. Spirochetes: Classification of Spirochetes • Types of infections & diagnosis - Skin and soft tissue infections, Respiratory tract infections, Cardiovascular System & Central Nervous System infections, Gastrointestinal tract infections, Urinary tract infections, Genital tract Infections • Investigation, prevention and control of hospital-acquired infections. • Viras taxonomy, replication, pathogenesis, Growth Curve, Growth Cycle. Host response, Environmental factors. Different methods of cultivation of viruses, animal inoculations, egg inoculation, cell culture, Viral Assay, • Classification of Viruses: Morphology, cultural characteristics, pathogenesis, lab diagnosis and treatment of Herpes virus, Poxviruses, Rhabdovirus, Polio virus, Hepatitis virus, HIV, Oncogenic viruses • Safety precautions in the virology laboratory • Taxonomy and classification of various medically important fungi. Superficial mycoses, Systemic Mycoses- general characteristics, Morphology, pathogenesis, laboratory diagnosis • General characters of Cestodes, Tremadotes, Nematodes, Habitat, Morphology, life cycle, Mode of infection, laboratory diagnosis • The Immune Response, Innate immunity, adaptive immunity, acquired immunity- active and passive immunity • Antigen and antibody: Types of antigens and determinants of antigenicity, Structure and functions of different immunoglobulins, Properties and functions of antibodies- monoclonal and polyclonal antibodies. • Antigen-Antibody reactions- Definition, Classification, General features, and mechanisms, applications of various antigen-antibody reactions Basic concept of humoral and cell-mediated immunity • Basic concepts of autoimmunity • Classification of vaccines
3	**Biochemistry**	• Preparation of solutions (percentage, Molarity, Normality) • Basic concepts of acids, bases, and buffers, their application in the Laboratory. Definition and determination of pH. • Definition and classification of carbohydrates, Glycolysis and TCA c Regulation of blood glucose. Diabetes mellitus, glycosuria • Classification of lipids, • Classification and biological importance of Amino acids and proteins Transamination, Oxidative and non-oxidative deamination, Urea cycl • Difference between DNA and RNA • Definition and classification of enzymes, Mechanism of action, Facto influencing enzyme action, Enzyme inhibition

		• Classification, RDA, biochemical function, deficiencies manifestatio Vitamins • Respiratory Quotient, Glycemic Index, Balanced Diet • Biological oxidation and Electron transport chain • Beta-oxidation of fatty acids, Synthesis and breakdown of cholesterol • Beer-Lambert's law, Spectroscopy – principle, instrumentation, ultrav and visible light spectroscopy, and its applications • Principle of Automation, Semi-automated and fully automated chemi analyser used in a clinical laboratory. • Laboratory safety and Universal precaution • Quality control, Phases in Laboratory and errors - Specimen collectio processing and handling in clinical laboratory, Sample acceptance an rejection criteria • SOP, Laboratory equipment- maintenance, lab reagents and kits, calibrators, concept of accuracy, precision, reliability, reproducibility • Liver Function Test • Renal Function Test • Thyroid Function Test • Cardiac Function Test

3. Master of Optometry (MOPTOM)

Unit	Topic Area	Detailed Syllabus
1	**Basics of Ocular Sciences**	• **Anatomy & Physiology:** o **Ocular:** Detailed anatomy and physiology of the human eye, including the anterior and posterior segments. o **Neuro-ophthalmology:** Anatomy of the visual pathway and pupillary reflexes (Amaurotic, Marcus Gunn, Adie's tonic pupil). • **Biochemistry & Nutrition:** Carbohydrate, protein, and lipid metabolism; enzymes and biological oxidation. o Macro and micro-nutrients and their specific effects on ocular health. • **Microbiology & Pathology:** o Principles of sterilization, disinfection, and hospital infection control. o Common ocular pathogens (bacteria, viruses, fungi, and parasites) and basic hematology
2	**Ocular Pharmacology**	Pharmacokinetics and pharmacodynamics of commonly used ocular drugs, indications, and adverse effects.
3	**Optics & Refraction**	• **Geometrical & Physical Optics:** Properties of light, mirrors, lenses, and prisms; ray optics and image formation. o Thick and thin prisms, telescope and microscope construction, and wave optics/lasers. • **Visual Optics:** o Optics of ocular structures, aberrations, and retinal image formation. schematic eyes o Refractive anomalies (Myopia, Hypermetropia, Astigmatism, Presbyopia) and their types and causes. o Clinical refraction techniques: Objective (Retinoscopy) and Subjective verification
4	**Clinical Optometry & Ocular Diseases**	• **Anterior Segment Diseases:** o Diseases of the Orbit, Lids, Lacrimal system, Conjunctiva, Uvea and Cornea • **Posterior Segment Diseases & Glaucoma:** o Diseases of Retina and Vitreous, Ocular Injuries, Lens, Glaucoma
5	**Clinical & Specialized Optometry**	• **Diagnostics:** Principles and working of various ophthalmic and optometric diagnostic instruments. • **Dispensing Optics:** Frame and lens selection, IPD measurement, lens transposition, and troubleshooting spectacle complaints. • **Contact Lenses:** Basics of CL optics, materials, fitting, assessment, and management of complications (Soft & RGP) • **Binocular Vision & Orthoptics:** Clinical presentation of binocular vision anomalies and evaluation using a test battery. • **Pediatric & Geriatric Optometry:** o Vision development and assessment in children; management of amblyopia and strabismus. o Physiological changes in the aging eye and specific workups for geriatric disorders. • **Low Vision & Rehabilitation:** Categories of visual impairment, low vision aids, training, and rehabilitation.

6	**Optometric Professional Practice:**	• **Public Health & Occupational Optometry:** Epidemiology of blindness, National Health Programmes (e.g., NPCB), and occupational visual standards. • **Research & Ethics:** Basic research designs & methodology, medical bioethics, and Intellectual Property Rights (IPR). o Patient safety principles and NABH quality standards.

4. Master of Dialysis Therapy (MDT)

Unit	Topic Area	Detailed Syllabus
1	**Basic Medical Sciences**	
	Human Anatomy	General Anatomy Cell, tissues, skin, anatomical terminology Systems Musculoskeletal: Bones, joints, muscles Classification, kinetics, diagnostic importance Cardiorespiratory: Heart, lungs, thoracic structures Digestive System: GI tract, liver, pancreas Excretory System: Kidney, ureter, bladder Nervous System: Brain, spinal cord, cranial nerves Functions, deficiencies Endocrine System: Pituitary, thyroid, adrenal glands Nutrition Reproductive System: Male & female organs Special Senses: Eye and ear
	Human Physiology	General Physiology Homeostasis, cell transport, body fluids Hematology Blood composition, Hb, RBC/WBC, coagulation, immunity Cardiovascular System Cardiac cycle, ECG, BP, cardiac output Respiratory System Mechanism of breathing, gas exchange Digestive System Digestion, absorption, enzymes Renal Physiology Nephron function, GFR, urine formation Nervous System Synapse, reflexes, CNS functions Endocrinology Hormones and gland functions Reproductive Physiology Spermatogenesis, menstrual cycle
	Biochemistry & Nutrition	Biomolecules Carbohydrates, proteins, lipids, nucleic acids Enzymes Metabolism ATP production, biological oxidation Vitamins & Minerals Balanced diet, BMR, malnutrition Clinical Biochemistry
2	**Microbiology & Pathology**	
	Microbiology	Basics of bacteriology, virology, mycology, parasitology

		Cell injury, inflammation, neoplasia Sterilization, disinfection, infection control Immunology (antigen-antibody reactions) Common pathogens: Bacteria (Staphylococcus, E. coli, TB) Viruses (HIV, HBV) Parasites (Malaria, helminths) Laboratory diagnosis and staining techniques
	Pathology & Hematology	Hematopoiesis and blood disorders CBC interpretation Blood collection and anticoagulants Histopathology & cytology basics Blood bank principles
4	**Dialysis Technology Core Concepts**	
	Principles of Dialysis	Diffusion, ultrafiltration, osmosis Types: Hemodialysis Peritoneal dialysis Indications & contraindications
	Hemodialysis	Components: Dialyzer, dialysate, tubing system Vascular access: AV fistula, graft, catheter Dialysis procedure: Patient preparation Machine setup Monitoring parameters Complications: Hypotension, cramps, infection
	Dialysis Equipment & Maintenance	Dialysis machine components Calibration and quality control Preventive maintenance Troubleshooting
	Water Treatment System	Importance of water purity Components: Pre-treatment (softener, carbon filter) Reverse osmosis (RO) Deionization Monitoring: Microbiological testing Chemical analysis
	Infection Control in Dialysis	Aseptic techniques Hand hygiene & PPE Biomedical waste management Nosocomial infections
	Special Dialysis	Pediatric dialysis Nocturnal and daily dialysis Online dialysis & advancements
	Continuous Therapies	CRRT MARS Hemoperfusion TPE

	Nutrition in Dialysis	PEM
4	**Clinical & Applied Topics**	
	Patient Care	Vital signs monitoring Fluid and electrolyte balance Emergency management
	Pharmacology (Basic)	Drugs in renal failure Anticoagulants in dialysis
	Public Health & Healthcare System	Indian healthcare system National health programs Epidemiology basics
	Ethics & Communication	Professional ethics Patient communication Legal aspects
5	**Practical Skills (Expected)**	Blood sample collection Dialysis machine handling Infection control practices Laboratory techniques Patient monitoring during dialysis

5. Master of Anaesthesia & Operation Theatre Technology (MAOTT)

Unit	Topic Area	Detailed Syllabus
1	**Pre-operative Assessment**	• Pre-anesthetic check-up (PAC) • ASA classification • Airway assessment (Mallampati, mouth opening) • Fasting guidelines • Basic investigations
2	**Airway Management**	• Bag-mask ventilation • Endotracheal intubation • LMA • Difficult airway (basic idea) • Complications: aspiration, laryngospasm
3	**General Anesthesia**	• Induction (IV drugs) • Maintenance (gases + drugs) • Recovery (extubation) • Basic complications: hypoxia, hypotension
4	**Regional Anesthesia**	• Spinal anesthesia (most important) • Epidural (basic idea) • Indications & contraindications • Complications: hypotension, headache
5	**Intra-operative Monitoring**	• Pulse oximeter • ECG • Blood pressure • Capnography
6	**Post-operative Care**	• Recovery room care • Pain management • Nausea & vomiting • Respiratory depression
7	**Surgical Basics**	• Types of surgery (general, ortho, OBGY) • Patient positioning • Blood loss (basic idea) • Laparoscopic surgery basics
8	**Emergency Basics**	• CPR (BLS) • Shock (basic types) • Emergency airway • Oxygen therapy
9	**OT & Sterility**	• Sterilization • Operating Room Protocols • Biomedical waste • Infection control

6. Master of Advanced Care Paramedic (MACP)

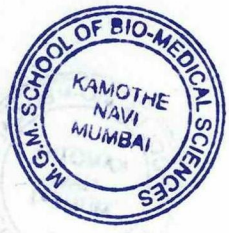
Unit	Topic Area	Detailed Syllabus
1	**Instrumentation of EMS**	• Pulse oximeter, Thermometer, Stethoscope, ECG machine, BP apparatus, Glucometer, Multipara Monitor, Oxygen cylinders, Oxygen delivery devices (nasal cannula, simple face mask, venturi mask, NRB Mask, HFNC), Bag-valve-mask (BVM) • Nasopharyngeal airway, Oropharyngeal Airway, Supraglottic Airway devices (LMA, King LT), Laryngoscope with various blades, Endotracheal Tube (Sizes for adults and pediatrics), • Intubating Stylet, Bougie, ET Tube Exchanger. • Syringes, Needles & IV Cannulas (Various sizes). IV set, IV fluids. Suture tray (needles drivers, forceps, scissors). Suture materials & needle (various sizes) Absorbable & Non-absorbable. Skin adhesive materials. • Dressing & bandage Materials, Tourniquet (Elastic, CAT & Pneumatic). Splinting and Traction Devices, C-collar, Long & short Spine Boards, Scope Board, Kendrick Extrication Devices • AED, Defibrillator, Infusion Pump, Syringe pump, Suction apparatus, Nebulizer. NG / OG Tubes. Urinary Catheter. Urine Collection bag / Meter • Infusion pumps (syringe, volumetric, smart pumps) • PCA, insulin pumps, anticoagulant infusers • Safety checks & troubleshooting • Neuro: ICP, EEG, pupilometer • Vitals: temperature monitoring • Lines: arterial line, CVP, PA catheter • Respiratory: ventilators, nebulizers • Neuromuscular monitoring (TOF) • Dialysis (CRRT, haemodialysis) • Feeding devices (gastrostomy, jejunostomy) • Parenteral nutrition systems • Portable X-ray, ultrasound • ABG, glucometer, lactate testing • FAST (POCUS), bedside ECHO • ECMO basics • IABP, VAD
2	**Introduction to Patient Assessment and Care**	
	Doctor Patient Interaction & History Taking	• Components of history taking: Presenting complaints, History of present illness (HOPI), Past medical and surgical history, Medication history, Family history, social history and allergies • Routine screening questions in emergency triage • Writing and documenting medical history • SOAP format in EMS
	General Examination	• Assessing General Health ▪ Condition Level of Consciousness (GCS, AVPU) ▪ Pain Assessment Scales ▪ Nutritional Status (BMI)
	Systemic Examination	• **Respiratory:** breath sounds, distress signs, SpO_2 • **Cardiovascular:** heart sounds, pulse, BP, perfusion • **Gastrointestinal:** abdominal exam, pain, bowel history

		• **Urinary:** symptoms, kidney exam, urine output, dehydration, AKI • **CNS:** GCS, pupils, cranial nerves, motor/sensory exam • **Muscle:** tone, strength (0–5), ROM, injuries • **Skeletal:** fractures, deformities, joint movement
	Focused Physical Exam	• Skin: colour, hydration, cyanosis, jaundice • Head/face: injuries • Eyes, ears, nose: trauma, discharge • Mouth/throat: airway, hygiene • Neck: lymph nodes, trachea, JVD • Nails: clubbing, koilonychia
3	**Prehospital Emergency Care**	• Role of EMT in EMS system • Scene safety, hazard identification, PPE use • Primary & secondary patient assessment (ABCDE approach) • Triage systems (START/SALT) for mass casualty • Patient handover using SBAR format
4	**Basic Life Support (BLS)**	• High-quality CPR for adult, child, infant • Automated External Defibrillator (AED) use • Relief of choking (foreign body airway obstruction) • Chain of survival concept
5	**Airway & Breathing Management**	• Oxygen delivery systems (nasal cannula, mask) • Bag-valve-mask ventilation technique • Airway adjuncts: OPA, NPA basics • Recognition of respiratory distress and failure
6	**Circulation & Shock**	• Vital signs monitoring and interpretation • External bleeding control (pressure, dressing, tourniquet) • Types of shock (hypovolemic, cardiogenic, septic, etc.) • Basic IV concept awareness
7	**Medical Emergencies**	• Cardiac: chest pain, myocardial infarction • Neurological: stroke, seizures, unconscious patient • Endocrine: hypo/hyperglycaemia • Toxicology: poisoning and overdose recognition
8	**Trauma Care**	• Mechanism of injury (RTA, falls, assaults) • Fractures, dislocations, splinting basics • Spinal injury recognition and immobilization • Head injury assessment • Burns classification and initial care
9	**EMS Operations**	• Ambulance equipment and organization • Communication systems and dispatch • Disaster management basics • Mass casualty incident (MCI) handling • Safe transport and patient packaging
10	**Basic Pharmacology**	• Common emergency drugs (adrenaline, glucose, oxygen, etc.) • Routes of drug administration (oral, IM, IV concept) • Basic understanding of dosage and safety

7. Master of Nutrition and Dietetics (MND)

CET Syllabus for the Master of Nutrition and Dietetics (MND) Programme for the academic year 2026

Unit	Topic Area	Detailed Syllabus
1	**Biochemistry & Metabolism**	Structure and functions of carbohydrates, proteins, and lipids; Enzymes – classification, kinetics, regulation; Digestion, absorption, and metabolism of nutrients; Carbohydrate metabolism (glycolysis, gluconeogenesis, TCA cycle); Lipid metabolism (beta-oxidation, lipogenesis); Protein metabolism (transamination, urea cycle); Hormonal regulation (insulin, glucagon); Oxidative stress and antioxidants
2	**Human Physiology**	Cell structure and function; Digestive system (structure and digestion process); Cardiovascular, respiratory, nervous systems; Endocrine system (hormones and functions); Renal system and fluid balance; Reproductive system; Homeostasis and body regulation mechanisms
3	**Fundamentals of Nutrition**	Definition and scope of nutrition; Macronutrients – functions, sources, requirements; Micronutrients – vitamins & minerals (RDA, deficiency, toxicity); Balanced diet and food groups; Energy concepts – BMR, TDEE, factors affecting requirements; Nutritional assessment (anthropometry, dietary, biochemical, clinical); Malnutrition – undernutrition and overnutrition
4	**Life Cycle Nutrition**	Nutrition during pregnancy and lactation; Infant nutrition (breastfeeding, complementary feeding); Nutrition for preschool, school-age children, adolescents, adults, and geriatrics; Nutritional requirements and common deficiencies across life stages
5	**Clinical Nutrition & Diet Therapy**	Principles of diet therapy; Diet modification (texture, consistency, nutrients); Nutrition care process; Therapeutic diets for diabetes, cardiovascular diseases, renal disorders, liver diseases, gastrointestinal disorders, cancer, obesity; Enteral and parenteral nutrition; Nutritional support in critical care
6	**Public Health Nutrition**	Concepts of public health and community nutrition; Nutritional problems in India (PEM, anemia, vitamin deficiencies); National nutrition programs (ICDS, Mid-Day Meal, POSHAN Abhiyaan); Food security and policies; Nutritional epidemiology; Community nutritional assessment; Nutrition education and communication; Sustainable nutrition
7	**Food Science & Food Safety**	Food groups and composition; Food preparation and cooking methods; Effect of cooking on nutrients; Food preservation techniques; Food safety and hygiene; Food adulteration; Food labeling and standards (FSSAI); Functional foods and nutraceuticals



8. M.Sc. Medical Physics

As per the guidelines of the **National Commission for Allied and Healthcare Professions (NCAHP)**, the entrance examination syllabus is based on the undergraduate (B.Sc. Physics) level with relevance to Medical Physics.

Unit	Topic Area	Detailed Syllabus
1	**Mechanics**	Linear and angular velocity – Linear and angular acceleration – Projectile motion – Impulse and impact – Simple harmonic motion – Moment of inertia – Theory of moments – Friction – Simple machines – Centre of gravity – Virtual work – Thrust and centre of pressure – Floating bodies – Metacentre – Atmospheric pressure versus altitude – Equation of continuity – Bernoulli's theorem and applications.
2	**General Physics, Sound, Heat and Thermodynamics**	Gravitation and elements of space science – Elasticity – Surface tension – Viscosity – Lissajous figures – Velocity of sound – Ultrasonics and applications – Acoustics of buildings – Recording and reproduction of sound – Doppler effect – Calorimetry – Kinetic theory of gases – Laws of thermodynamics (First, Second and Third) – Heat engines – Low temperature physics – Conduction, convection and radiation.
3	**Optics and Spectroscopy**	Reflection and refraction – Mirrors and lenses – Defects and aberrations – Interference – Diffraction – Polarization – Optical instruments – Optical fibres – Laser fundamentals – Photoelectric effect – Basics of spectroscopy.
4	**Electricity, Magnetism and Electromagnetism**	Electrostatics – Current electricity – Kirchhoff's laws – Electrolysis – Thermoelectric effects – Heating effect of current – Magnetic materials – Hysteresis – Galvanometers – Electromagnetic induction – Alternating current – Bridge circuits – LCR circuits – Transformers – Motors and generators.
5	**Electronics**	Semiconductor devices – Diodes and transistors – Rectifiers and power supplies – Amplifiers – Oscillators – Modulation and detection – Radiation and wave propagation –Microwaves – Electronic measuring instruments.
6	**Atomic Physics & Nuclear Physics**	Cathode rays – Electron theory of metals – Atomic structure – X-rays and applications – Wave mechanics (basic concepts) – Nuclear properties (size, charge, mass, spin) – Radioactivity and decay laws – Nuclear reactions – Particle accelerators – Nuclear energy – Cosmic rays and elementary particles.

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