



लाल बहादुर शास्त्री पैरामेडिकल काउंसिल उत्तर प्रदेश

Head Office: 2nd Floor Sunil Complex Near RG PG College Meerut



Syllabus

Diploma in

X-RAY

Technician

at the

LBSPC

Exam: June & December

(To be implemented from 2023-24 session)

LAL BHADUR SHASTRI PARAMEDICAL COUNCIL

DIPLOMA IN X-RAY TECHNICIAN

DURATION: 02 YEARS

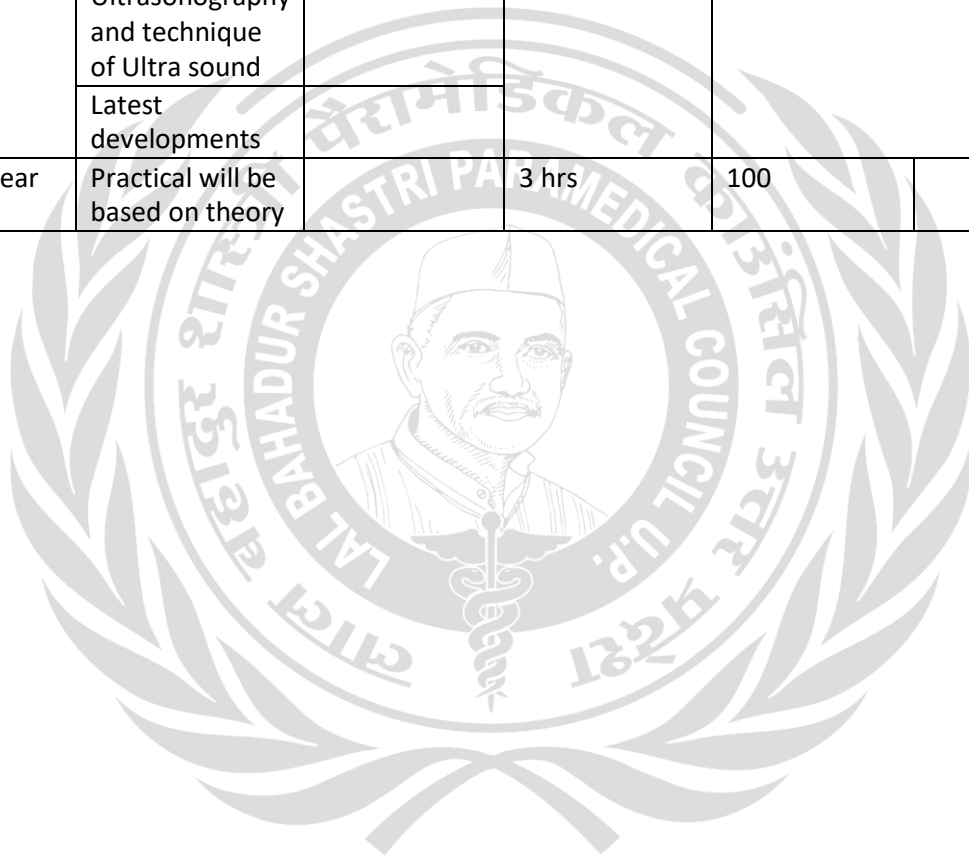
SYLLABUS

FIRST YEAR

	Subject	Duration Of Study	Duration of Examination	Maximum marks	Passing marks
First Year Theory papers	General aspects		3 hrs	100	
	Human anatomy and Human Physiology				
	Protection against radiological hazards				
	Basic & radiation physics				
	Basics orientation of radiotherapy				
	Radiological procedures and Dark room procedure				
First Year Practical	Practical will be based on theory		3 hrs	100	

SECOND YEAR

	Subject	Duration Of Study	Duration of Examination	Maximum marks	Passing marks
Second Year Theory papers	Basic Radiographic techniques		3 hrs	100	
	Regional Radiography & radiological Procedure				
	Equipments for Radio diagnosis				
	Ultrasonography and technique of Ultra sound				
	Latest developments				
Second Year Practical	Practical will be based on theory		3 hrs	100	



First Year

PAPER	SUBJECT	MAX. MARKS	PASSING MARKS
First Theory	Human Anatomy, Physiology, Basic Pathology, Microbiology & Pharmacology	50	25
First Practical	Human Anatomy, Physiology, Basic Pathology, Microbiology & Pharmacology	100	50
Second Theory	Radiation Physics, Community Medicine & Radiation Hazards, Basic Medicine, Surgery, Orthopedics, Obstetrics & Gynecology	50	25
Second Practical	Radiation Physics, Community Medicine & Radiation Hazards, Basic Medicine, Surgery, Orthopedics, Obstetrics & Gynecology	100	50

Second Year

PAPER	SUBJECT	MAX. MARKS	PASSING MARKS
First Theory	Radiography & Radiographic Techniques	50	25
First Practical	Radiography & Radiographic Techniques	100	50
Second Theory	Radiotherapy & Radiographic Techniques	50	25
Second Practical	Radiotherapy & Radiographic Techniques	100	50

Detailed curriculum

Note-For theory subjects Students are expected to receive knowledge which is important for them to correlate practical teaching.

Year of study and paper	SUBJECT	
FIRST YEAR THEORY PAPER	<p>1-GENERAL ASPECTS A-GENERAL FUNCTIONING OF DIFFERENT TYPES OF HOSPITALS B-HOSPITAL ADMINISTRATION. C-GENERAL PATTERN OF THE STAFF. D-HOSPITAL RECORD KEEPING. E-FUNCTIONING OF GENERAL WARDS. F-FUNCTIONING OF SPECIAL WARDS. G-INTER DEPARTMENTAL RELATIONS AND WORK CULTURE H-RELATIONS WITH SENIOR AND OTHER STAFF I-CARE AND ATTENTION OF OPD AND INDOOR PATIENTS. J-CARE AND ATTENTION OF CRITICAL AND INJURED PATIENTS. K-LESSONS ON PREPARATION OF THE PATIENTS FOR GENERAL AND SPECIAL INVESTIGATIONS. L-PROFESSIONAL ETIQUETTE AND ETHICS</p>	
	<p>2-HUMAN ANATOMY AND HUMAN PHYSIOLOGY A-ORGANS AND SYSTEMS. B-ANATOMICAL POSITION OF THE BODY. C-AXIS AND PLANES. D-B ONES- CLASSIFICATION - DEVELOPMENT - PARTS OF LONG BONES - BLOOD SUPPLY OF BONES - DIFFERENT BONES OF THE BODY INCLUDING STERNUM AND VERTEBRAE & RIBS E-JOINTS - DEFINITION, CLASSIFICATION, MOVEMENTS OF DIFFERENT JOINTS. - DIFFERENT JOINTS OF THE BODY F-OUTLINE OF VARIOUS PARTS OF THE THORACIC CAGE G-OUTLINE OF VARIOUS VISCRA OF THE ABDOMEN. H-SURFACE MEASURING AND RADIOLOGICAL PROCEDURES USED IN THE STUDY OF THRACIC AND ABDOMINAL ORGANS. I-OUTLINE OF BRAIN AND ITS PARTS PHYSIOLOGY A-OUTLINE OF FUNCTIONING OF VARIOUS SYSTEMS OF</p>	

	<p>THE BODY B-COMPOSITION OF BLOOD. C-E.C.G. D-GENERAL PRINCIPLES OF ENDOCRINOLOGY E-PHYSIOLOGY OF KIDNEY AND URINE FORMATION. F-PHYSIOLOGY OF MALE AND FEMALE REPRODUCTIVE SYSTEM.</p>	
	<p>3-PROTECTION AGAINST RADIOLOGICAL HAZARDS- A-LIKELY HAZARDS FACED WHILE WORKING IN X RAY DEPARTMENT. B-HAZARDOUS MATERIALS C-METHODS TO PROTECT THESE HAZARDS.</p>	
	<p>BASIC & RADIATION PHYSICS-</p> <ol style="list-style-type: none"> 1-FUNDAMENTAL OF PHYSICS 2-MEASUREMENTS UNITS OF CGS AND MRS SYSTEM 3-ELECTRIC CHARGE. 4-CURRENT AND RESISTANCE. 5-ELECTROMAGNETIC INDUCTION SELF AND MUTUAL PRODUCTION OF A.C. CURRENT. 6-TRANSFORMERS LOSSES CONSTRUCTION, REGULATIONS AND TYPES USED IN X RAY APPARATUS. 7-THERMIONIC EMISSION VACUUM DIODE. 8-THE DIODE AS RECTIFIER AND AS AN X RAY TUBE. 9-TYPES OF RECTIFICATION AND METHODS USED IN DIAGNOSTIC AND THERAPY UNITS. 10- RT CABLES. 11-MATTER & ENERGY. 12-RADIATION & SPECTRA. 13-ATOMS & NUCLEI. 14-RADIOACTIVITY. 15- PRODUCTION. 16- MEASUREMENT. 17- CONTROL & INDICATING DEVICES. 18- ROENTGEN & ITS MEASUREMENTS. 19- GEIGER MOLLER & SCINTILLATION COUNTERS & DOSIMETER 20- ABSORBED DOSES & RAD 21- FILTERS & FILTRATION 	
	<p>BASICS ORIENTATION OF RADIOTHERAPY-</p> <p>TECHNICAL ASPECTS OF X AND GAMMA RAYS THERAPY. TUMOR LOCALIZATION AND VERIFICATION, FIELD COMBINATION TREATMENT PLANNING, USE OF STIMULATORS.</p> <p>TECHNICAL ASPECTS OF THE USE OF RADIOACTIVE SUBSTANCES IN THERAPY, CONSTRUCTION OF RADIUM NEEDLES AND TUBES.</p> <p>DOSE CALCULATION USING INVERSE SQUARE LAW, PRINCIPLES OF MOULDS AND IMPLANTS.</p>	

	<p>APPLICATION OF BETA-RAYS THERAPY, PRINCIPLES OF CLINICAL USES OF UNSEALED RADIOACTIVE SOURCES PROTECTION, PROTECTIVE MATERIALS IN COMMON USE. ROOM AND MACHINE PROTECTION.</p> <p>INSTALLATION OF X AND GAMMA RAYS UNITS, CARE AND CUSTODY OF SOURCES OF IONIZING RADIATION, PERSONAL MONITORING SYSTEMS, TYPES OF APPARATUS OF X RAY THERAPY APPARATUS FOR SUPER VOLTAGE SOURCES. APPARATUS FOR SEALED SOURCES.</p> <p>COBALT-60 AND CAESIUM 137 SHORT AND LONG DISTANCE TECHNIQUES.</p> <p>BIOLOGICAL EFFECTS OF IONIZING RADIATION. GENETIC EFFECTS.</p> <p>SOMATIC EFFECTS ON BLOOD AND TISSUE. CARE OF THE THERAPY PATIENT. REPORTING IN CHANGES OF CONDITION DUE TO TREATMENT.</p> <p>GENERAL WELFARE OF PATIENTS. KEEPING OF INDIVIDUAL RECORD. NEED FOR ACCURACY IN DOSAGE. POSITIONING AND RECORDING OF DOSAGES.</p>	
	<p>RADIOLOGICAL PROCEDURES</p> <p>CONTRAST MEDIA- TYPES, PROPERTIES, REACTION & TREATMENT.</p> <p>GENITOURINARY SYSTEM-IVU, MCU, RCU, HSG.</p> <p>GI TRACT-BA SWALLOW, BA MEAL, BA FOLLOW THROUGH, BA ENEMA, SMALL BOWEL.</p> <p>ENEMA, DOUBLE CONTRAST ENEMA, SIALOGRAPHY.</p> <p>BILARY TRACT-OCG, IVP EPCP, PTHC, T TUBE & OPERATIVE CHOLANGIORAPHY.</p> <p>DARK ROOM PROCEDURE</p> <p>SITTING LAY OUT & FITTINGS</p> <p>CASSETTE & FILM HANDLING-LOADING & UNLOADING, SAFE LIGHT.</p> <p>MANUAL & AUTOMATIC PROCESSING-PRACTICAL ASPECT</p>	
	<p>PRACTICAL WILL BE BASED ON THEORY</p>	

	2ND YEAR	
SECOND YEAR THEORY PAPER	<p>BASIC RADIOGRAPHIC TECHNIQUES</p> <p>SKULL : RADIOGRAPHY OF CRANIAL BONES, CRANIUM, SELLA TURCICA, ORBIT OPTICFORMINA, SUPERIOR ORBITAL FISSURE AND INFERIOR ORBITAL FISSURE.</p> <p>FACIAL BONES: PARANASAL SINUSES. TEMPORAL BONE. DENTAL RADIOGRAPHY. RADIOGRAPHY OF TEETH INTRA ORAL, EXTRA ORAL AND OCCULUSAL VIEW.</p> <p>ABDOMEN: PREPARATION OF PATIENT, GENERAL, ACUTE POSITIONING FOR FLUID AND AIR LEAVES. PLAIN FILM EXAMINATION. RADIOGRAPHY OF FEMALE ABDOMEN TO LOOK FOR PRGNANCY. MACRO RADIOGRAPHY, PRINCIPAL, ADVANTAGE, TECHNIQUE AND APPLICATIONS.</p> <p>STEREOGRAPHY: PROCEDURE-PRESENTATION, FOR VIEWING, STEREOSCOPES, STEREMETY. HIGH KV TECHNIQUE PRINCIPLE AND ITS APPLICATIONS. SOFT TISSUE TECHNIQUES-MAMMOGRAPHY, LOCALIZATION OF BODIES.</p> <p>WARD MOBILE RADIOGRAPHY: GENERAL PRECAUTIONS, ASPESIS IN TECHNIQUES. CHECKING OF MAINS SUPPLY AND FUNCTIONS OF EQUIPMENT, SELECTION OF EXPOSURE FACTORS, EXPLOSION RISKS. RADIATION PROTECTION AND RAPID PROCESSING TECHNIQUES.</p>	
	<p>REGIONAL RADIOGRAPHY & RADIOLOGICAL PROCEDURES</p> <p>COMMON TERMINOLOGY</p> <p>RADIOGRAPHY OF EACH PART POSITIONING</p> <p>PATIENT HANDLING & PREPARATION</p> <p>DRUGS IN X RAYS DEPT.</p> <p>CLINICAL, ETHICAL & LEGAL RESPONSIBILITY,(INCLUDING MEDICO, LEGAL/ACCIDENT CASES</p>	
	<p>EQUIPMENTS FOR RADIO DIAGNOSIS</p> <p>EQUIPMENTS FOR RADIOTHERAPY INCLUDING NEWER DEVELOPMENTS</p> <p>ORTHO VOLTAGE EQUIPMENT WITH SPECIAL REFERENCE TO PHYSICAL DESIGN REQUIREMENT OF TUBE AND ITS ACCESSORIES AND INTERLOCKS, GAMMA RAY SOURCES USED IN RADIOTHERAPY ESPECIALLY COBALT 60 SOURCE ITS CONSTRUCTION AND SOURCE HOUSING AND HANDLING MECHANISM. PRINCIPLES OF ISOCENTRIC. TELE-ISOTOPE MACHINES MEGA VOLTAGE X RAYS AND ELECTRON BEAM ACCELERATORS AND BELATRON. SALIENT FEATURES OF COMPONENTS OF LINEAR ACCELERATOR LIKE TUBE DESIGN, WAKE GUIDE, TARGET DESIGN BEAM BENDING SYSTEM. RADIO-FREQUENCY GENERATORS KILE MAGNETRON AND</p>	

	<p>LIESTRON. BASIC PRINCIPLE OF REMOTE AFTER-LOADING SYSTEM/MACHINES FOR MAKING CASTS. STEREOFOAM TEMPLATE CUTTING SYSTEM INTRODUCTION TO RADIO-SURGERY EQUIPMENT AND DOSIMETRY EQUIPMENT.</p> <p>PRACTICAL BASED ON THEORY</p>	
	<p>ULTRASONOGRAPHY AND TECHNIQUE OF ULTRA SOUND</p> <p>RADIOLOGICAL PROCEDURES PERTAINING TO SALIVARY GLANDS, LACRIMAL SYSTEM, BROCHOGRAPHY ARTHROGRAPHY AND HYSTEROSALPANGLOGRAPHY VARIOUS REQUIREMENT TROLLEY SET UP, INDICATIONS AND CONTRA INDICATIONS, CONTRAST MEDIA USED.</p> <p>VENTRICULOGRAPHY AND ENCEPHALOGRAPHY-TECHNIQUE, CONTRAST MEDIA USED, FILM SEQUENCE, INDICATION CONTRA INDICATIONS.</p> <p>MYELOGRAPHY, TECHNIQUE, CONTRAST MEDIA USED, INJECTION OF CONTRAST MEDIA, INDICATIONS AND CONTRA INDICATIONS.</p> <p>I.V.P. AND CYSTOGRAPHY ETC.</p> <p>INTRA-VEIN CHOLANGIOGRAPHY T.TUBE: CHOLANGIOGRAPHY PREOPERATIVE CHOLANGIOGRAPHY PROCEDURE CONTRAST MEDIA INDICATION & CONTRA INDICATIONS.</p> <p>DOUBLE CONTRAST BARIUM STUDIES (SMALL BOWEL ENEMA BA ENEMA ETC.) PRE-OPERATIVE CHOLANGIOGRAPHY PROCEDURE CONTRAST MEDIA INDICATIONS AS CONTRAST MEDIA USED.</p> <p>ANGIOGRAPHY: CEREBRAL CARDIAC ABDOMINAL AORTOGRAPHY GENERAL ANAL AND SELECTIVE RENAL.</p> <p>SPLENOPORTOVENOGRAPHY PERIPHERAL ARTERIAL AND VENOUS ANGIOGRAPHY PRECATUTIONS RADIATION PROTECTION FILM CHARGE MANUAL AUTOMATIC BIPLANE FILM TYPES LARGE MINIATURE CINE CONTRAST MEDIA INJECTION PROCEDURE AND TECHNIQUE.</p> <p>INTERVENTIONAL RADIOLOGICAL PROCEDURES.</p> <p>PTC. PTBD, ERCP, FINE NEEDLE ASPIRATION CYTOLOGY PERCUTANEOUS NEPHOROSTOMY. CARDIAC CATHERIZATION IMMOBILIZATIONS DILATION ETC.</p>	
	<p>LATEST DEVELOPMENTS SPECIAL RADIOLOGY</p>	

	<p>EQUIPMENT</p> <ul style="list-style-type: none"> -IMAGE INTENSIFIER & TV MONITOR -MAMMOGRAPHY -DIGITAL RADIOGRAPHY -PICTORIAL ARCHIVING & COMMUNICATION SYSTEM (PACS) -COMPUTERS IN RADIOLOGY <p>COMPUTED TOPOGRAPHY: HISTORICAL DEVELOPMENTS, ITS PRINCIPLE AND APPLICATIONS, VARIOUS GENERATORS AND DEFINITION OF TERMS AND CROSS SECTIONAL ANATOMY.</p> <p>RECENT DEVELOPMENTS IN CT- SPECIAL CT (TRIPLE PHASE CT STUDY FOR HEPATIC & PANCREATIC TUMOR, MULTISLICE CT, PRINCIPLES OF CT ANGIO, CT GUIDED BIOPSIES & DRAINAGE.</p> <p>MRI RECENT DEVELOPMENTS IN US – 3D USG, COLOUR DOPPER, 4D USG, GUIDED BIOPSIES & DRAINAGE.</p> <p>DIAGNOSTIC ULTRASOUND: ITS PRINCIPLE APPLICATIONS AND ROLE IN MEDICINE. VARIOUS TYPES OF TRANSDUCERS AND DEFINITION TERMS AND CROSS SECTIONAL ANATOMY.</p> <p>DIGITAL RADIOGRAPHY: PRINCIPLE SCANNED PROJECTION RADIOGRAPHY DIGITAL SUBTRACTION ANGIOGRAPHY APPLICATION AND DEFINITIONS OF TERMS.</p>	
	<p>PRACTICAL WILL BE BASED ON THEORY</p>	

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