Ref. No. EduCareer/2021/79

Dated: 15-03-2020

MEDICAL IMAGING TECHNICIAN - 1 YEAR

PROGRAM STRUCTURE	
Institutes	EduCareer Sindh Institute (Private) Limited Al Shifa Trust Eye Hospital Sukkur
Program Name	Medical Imaging Technician
Program Type	Condensed
Duration	1 Year
Eligibility	Matric (Science)
Attendance	70% Attendance is compulsory
Requirement for Award of Diploma	The candidate must secure Fifty percent (50%) in Theory and Fifty percent (50%) in Practical to pass the exams.
Re Appearance in the Exams	The candidate can re appear for two attempts in the exams in case of failure. If Candidate passes theory or practical exams respectively, he/she will not be required to re appear in the exams of theory or practical respectively.
Grading System	The candidate, qualifying for the grant of Diplomashall be placed in following grades; A1 Grade – More Than 80% MarksA Grade – More than 70% Marks B Grade – More than 60% Marks C Grade – More than 50% Marks
Examination	Annual Exams announced` by the SBTE.

PROGRAM STRUCTURE
Ensure that the X-Ray films of the patients from wards are sent to the wards as soon as Radiologist has written the report. ***Preventive*** Ensure safe custody of all the accessories of the X-Ray unit of which s/he is in charge. Keeps the X-Ray rooms locked when not in use. Understand and observes health and safety precautions/instructions for self and others protection. Wears dosimeter during duty. Ensure that cardiac and respiratory stimulants are at hand, whenever any special investigation with contrast media is being undertaken. ***General*** Ensures that the unit is not misused. Confirms that the unit and the room where it is installed are cleaned at the commencement and the termination of work and additionally if required. That daily account of the X-Ray films expended is kept by making entries in the Stock Book and whenever, film packets are taken out of the stores. Learns new techniques and technologies as required by professional bodies. Imparts appropriate training to students and other staff.

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Medical Imaging Technician –Marks Distribution				
No	**Subject**	**Theory Marks**	**Clinical/ Practical Training Marks**	**Total Marks**
1.	**Radiological Anatomy**	100 Marks	100 Marks	200 Marks
2.	**Imaging Equipment, Accessories, Maintenance and Quality Assurances**	100 Marks	100 Marks	200 Marks
3.	**Radiographic Techniques**	100 Marks	100 Marks	200 Marks
Total of 1 Year		**400 Marks**	**400 Marks**	**800 Marks**

Medical Imaging Technician – Training Plan					
Type of Training	**Daily Training**	**Weekly Training**	**Total Weeks**	**Total Training**	**Total No of Months**
Institute Training	1 Hours	5 Hours	44 Weeks	220 Hours	11 Months
Clinical Training	3 Hours	15 Hours	44 Weeks	660 Hours	
Total	**4 Hours**	**20 Hours**	**44 Weeks**	**880 Hours**	
Vacations & Other Activities				1 Month	
Total of 1 Year				**12 Months**	

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Medical Imaging Technician – Curriculum	
1. Radiological Anatomy – Curriculum	
Rationale	Proper functioning of Medical Imaging Assistant requires a basic knowledge of the anatomical structures being focused. This knowledge would facilitate proper positioning of patients and imaging equipments. It would also help in assessing the gross findings of the imaging procedure and guiding about the subsequent actions.
Scope	This section will augment that learning and will provide additional knowledge to develop specific insight for the radiological procedures being contemplated.
Learning Objectives	After completing this sub-section the students will be able to: • Understand a) positioning terminologies: Recumbent, Supine, Prone, Trendelenburg, Decubitus; b) terms of direction: Anterior, Posterior, Oblique, Ventral/dorsal, Medial/lateral, Superior/inferior, Proximal/distal, Cephalad/caudad; c) general planes: Sagittal or mid- sagittal, Coronal or mid-coronal, Transverse, Longitudinal • Know the reasons for adopting specific positioning for particular procedures. • Able to appropriately mark important organs on body surface

Workshop/ Lecture Title	Class Room Training	Practical Training
1. Positioning terminologies, terms of direction and general planes	5 Hours	10 Hours
2. Surface contours of the body, surface marking	5 Hours	10 Hours
3. Bones – types, structure; formation and growth	5 Hours	10 Hours
4. Skeletal system in brief; skeletal land marks	5 Hours	10 Hours
5. Joints – classification and structure	5 Hours	10 Hours
6. Body cavities and their contents	5 Hours	10 Hours
7. Head and neck, skull, face, salivary glands & paranasal sinuses	5 Hours	10 Hours
8. Shoulder and upper limbs	5 Hours	10 Hours
9. Lower limbs including pelvis	5 Hours	10 Hours
10. Vertebral column; regions and curves	5 Hours	10 Hours
11. Thorax	5 Hours	10 Hours
12. Mastoid & temporal bone; anatomy of ear	5 Hours	10 Hours
13. Male and female reproductive system	5 Hours	10 Hours
Total Teaching Hours	**65 Hours**	**130 Hours**
	195 Hours	

2. Imaging Equipment, Accessories; Maintenance and Quality Assurance			
Rationale	In order to operate and optimally maintain the equipment of diagnosticradiology, the student should be familiar with a wide range of gadgets used in this field. The technicians ought to understand the construction and functions of different equipments in order to optimize their use.		
Scope	Components and functions of different machines will be taught. These include the devices used for X-ray production, targeting and focusing andimage production. The specialized equipments like dental and mobile units will also be covered. The technician will also be enabled to maintain the equipments and ensure their quality performance.		
Learning Objectives	After completing this sub-section, the students will be able to: 1. Understand functioning of machines used in diagnostic radiology and proficiently operate them. 2. Maintain the various diagnostic and imaging units at their optimalperformance		
Workshop/ Lecture Title		**Class Room Training**	**Practical Training**
1. High tension generators		5 Hours	25 Hours
2. X-Ray Tubes; construction, types		7 Hours	25 Hours
3. Beam limiting and centering devices		7 Hours	25 Hours
4. Functions and components of automatic exposure control (AEC) dev		7 Hours	25 Hours
5. Portable and Mobile X-Ray Units: components, types and applications		7 Hours	25 Hours
6. Fluoroscopy: types, image intensification, digital fluoroscopic equipment, C-arm fluoroscopic equipment		7 Hours	25 Hours
7. Specialized x-ray equipment: skull table, dental x-ray 8. equipment, mammography x-ray equipment		7 Hours	25 Hours
9. Composition and constituents of x-ray films, methods of 10. storage of films		7 Hours	25 Hours
11. Care and Maintenance of X-ray equipment: protocols forextending tube life, quality assurance tests on equipment		7 Hours	25 Hours
Total Teaching Hours		**75 Hours**	**275 Hours**
		350 Hours	

3. Radiographic Techniques			
Rationale	Gaining mastery on routine radiographic procedures and becoming proficient in assisting the radiologist for special diagnostic measures is the prime functionof a radiographic technician. The student needs to have enough practicing opportunities to augment classroom teaching to be enabled for undertaking the above mentioned roles.		
Scope	This Unit would provide the knowledge base necessary to perform standard imaging procedures. Contents would facilitate learning of the whole range of activities required for routine radiography. After applying correct positions foroptimal results, the students would understand the phenomena of exposure, developing and fixing of X-ray films. They will understand the basis for radiographic image quality and its dependence on film factors, geometric factors and subject factors. Production and control of scatter radiation, grid, its performance and problems, effect of scatter on image contrast will also be covered. Finally, the radiographic faults and their remedies will be included as well.		
Learning Objectives	After completing this unit, the students will be able to: • Improve the quality of imaging thereby increasing the diagnostic value • Reduce the radiation exposure • Ensure reduction of film wastage and repeat examination		
	Workshop/ Lecture Title	**Class Room Training**	**Practical Training**
1	Positioning Techniques for performing various radiographic Procedures	8 Hours	25 Hours
2	Radiographic positioning of bed cases; mobile/ in wardradiography & operating theatre radiography, trauma Radiography	8 Hours	30 Hours
3	Pediatric radiography	8 Hours	25 Hours
4	Exposure, exposure factors and errors in exposure	8 Hours	25 Hours
5	Detailed description of radiographic film, its processing and storage	8 Hours	25 Hours
6	Film Technique: variation of films and screens with patient's thickness and an anatomical structure	8 Hours	25 Hours
7	Chemicals used in film development; developing washing and fixing in dark room, drying of films	8 Hours	25 Hours
8	Film development with automatic techniques	8 Hours	25 Hours
9	Radiographic intensifying / fluorescent screens; purpose and methods of use	8 Hours	25 Hours
10	Conventional Tomography - principles & techniques	8 Hours	25 Hours
Total Teaching Hours		**80 Hours**	**255 Hours**
		335 Hours	

Clinical/ Practical Attachment

The extensive internship will reinforce the classroom learning and enable the student to understand how to handle the workload in different disciplines of radiology. It is this aspect of the course that will determine the level of professionalism students will display after employment. This period will be interspersed with learning of theory.

During the one year of this program the students will be placed in x-ray departments on a roster basis to gain practical experience in relevant areas under supervision of Tutor Radiographers and the Radiologists. On availability of the following sections, the student will get a rotation amongst them: main / general radiology, OPD, orthopedics, pediatrics, emergency, neurosurgery, chest clinic, mobile unit, ultrasonography, CT Scanning and MRI.

Practical Notebook

Students will maintain a record of their attachment in the 'Practical Note Books' (one for each section), the last portion of which would be designed as a 'Log Book' which shall be a work diary and record. Special mention shall be made of the procedures, if any, conducted by the candidate. This diary shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the practical /viva examination.

Recommended Books

1. Physics for Class XI and XII by Punjab Text Book Board
2. Physics for Radiology Students By. Dr. M.B. Zafar. Publisher: Zafars 273-A-1 Abid Majeed Road, Rawalpindi
3. Radiophysics and Darkroom Procedures (3rd edition), LC Gupta and Abhitabh Gupta. Jaypee Brothers Medical Publishers, New Delhi
4. X-Ray Equipment for Student Radiographers. By. DN & MO Chesney. Publishers: MacMillan Press, London
5. Merril's Atlas on Radiographic Position and Radiological Procedures Vol.: I,II & III. By. Phillip. W. Belliager. Publisher: C.V. Mosby Company St: Louis, Toronto & Preston
6. Atlas of Radiographic Positioning and Radiological Procedure; Philip W. Ballinger, Publishers: Mosby
7. Clark's Positioning in Radiography; RA Swallow, E Naylor; C.B.S. Publication
8. Roentgenologic Techniques; Sante L R; Publishers: Edward Arnold
9. A Radiographic Index; Goldman; WRIGHT Publication
10. A handbook of Radiography; Ross & Gailway; Lewis
11. Diagnostic Radiography, Glenda J.Bryan; Publishers: Mosby
12. Medical Radiographic Technique; Piles; Thom
13. Radiology Technician by Usman Publications Lahore