

Specialization	Radiologic Technology
Course Number	020810151
Course Title	Radiographic Equipment
Credit Hours	(3)
Theoretical Hours	(1)
Practical Hours	(6)

Brief Course Description:

- The aim of this course is to provide the student with the basic essential knowledge about the available equipments in the radiology department including the design and function of these equipments; in addition to their performance and maintenance where possible; and finally to be familiar with the impact of technology on the progress of diagnostic imaging.

Course Objectives:

Upon the completion of the course, the student will be able to:

Know a good theoretical information about the design of imaging equipments .

1. Know the function and performance of these equipments.
2. Be familiar with these equipments.
3. Acquire the awareness of the use of computer –aided image analysis.
4. Apply practical skills related to theoretical material.

Unit Number	Unit Name	Unit Content	Time Needed
1	X-ray tube	<ul style="list-style-type: none"> • General design, construction and operation. • Care of x-ray tube. 	
2	X-ray generator	<ul style="list-style-type: none"> • Voltage transformation. • High tension primary circuit and high tension cables • Rectification. • Exposure switching & exposure timing 	
3	Radiographic couches, stands & tube supports	<ul style="list-style-type: none"> • X-ray tube support. • Radiographic couches. • Chest stand. • Vertical Buckys. 	
4	Fluoroscopic Equipment	<ul style="list-style-type: none"> • Types of fluoroscopic equipment • Mobile and specialized fluoroscopic units • T.V Camera & monitor. • Image recording. 	
5	Mobile radiographic equipment	<ul style="list-style-type: none"> • Electrical energy source. • Conventional generators. • Capacitor discharge equipment. • Battery powered generators. • Physical features. 	
6	Mammographic Equipment	<ul style="list-style-type: none"> • Mammographic x-ray tube. • Compression. • Exposure timing • Breast support plate. 	
7	Dental Radiographic Equipment	<ul style="list-style-type: none"> • Intra oral equipment. • Cephalostat (craniostat). • Orthopantomography. 	
8	Computer Based Imaging Modalities	<ul style="list-style-type: none"> • Difference between analogue and digital. • Benefits of diagnostic image digitization. 	
9	Computed Tomography	<ul style="list-style-type: none"> • Equipment for CT and x-ray generator. • The table, operating / display console. • The computer. • Use of CT equipment: the op judgement. 	
10	Radionuclide imaging	<ul style="list-style-type: none"> • Gamma camera: camera gentry, couch, computer facilities. • Types of radioactivity. • Radiation dosimetry 	
11	Equipment for ultrasound	<ul style="list-style-type: none"> • Nature of Ultrasound. • Probes, transducers and ultrasound beam Shapes. 	

		<ul style="list-style-type: none"> • Safety in ultrasound. • Care of ultrasound Equipment 	
12	Magnetic resonance imaging (MRI)	<ul style="list-style-type: none"> • MR signal and image. • MR scanner: construction and design. • MR system: instillations, oxygen monitoring, observing the patient, changing room requirement. • Safety consideration 	
13	Clinical Part	<ul style="list-style-type: none"> • Describe the type of x ray tube and machine used by listing the: <ol style="list-style-type: none"> 1. Manufacturer 2. Focal spot size 3. Heat capacity of tube (rating chart) 4. Generator size and type (mA, kVp, mfg.) 5. Current phase (single or multi) 6. Type rectification 7. Special features of the various radiographic/fluoroscopic units (i.e. Video tape records, 100mm, spot film cameras, cine, spot film devices, etc.). • Properly use the various image recording devices (i.e. cine, 100mm. spotcameras, video tape recorders). • Prepare contrast agents (barium sulfate and iodinated compounds) for various prescribed studies. • Know and understand various examination preparation procedures and the importance of a well prepared patient for specific contrast studies. • Properly use upright Bucky. • Properly utilize processing equipment and accessories. 	

Teaching Methodology:

1. Lectures.
2. Discussion and quizzes.
3. Home works
4. Demonstration and practical training.
5. Training field competencies assessment.

Text Books & References:

1. Christensen's Physics of Diagnostic Radiology Fourth Edition by Thomas S. Curry III MD (Author), James E. Dowdey PhD (Author), Robert E. Murry Jr. PhD (Author).
2. Chesney's equipment for student radiographers 5th edition 2006, Peter Carter, Audrey Paterson, Mike Thornton, Andrew Hyatt, John Pirrie.
3. The WHO Manual Of Diagnostic imaging: Radiographic Technique & projections By Staffan Sandstorm, Publisher: WHO 2003.
4. Radiation Exposure and Image Quality in X-Ray Diagnostic Radiology: Physical Principles and Clinical Applications 2nd ed. 2012 Edition by Horst Aichinger (Author), Joachim Dierker (Author), Sigrid Joite-Barfuß (Author), Manfred Säbel (Author).