



Course Syllabus of Quality Assurance in Radiology

Faculty: Medicine and Health Sciences

Department: Health Sciences

Program: Bachelor in Radiologic Technology and Medical Imaging

I. General information about the course instructor :

Name	Dr. Abdullah Taher	Office Hours(2 Hours Weekly)					
Location & phone number	UST- 715989708	Sat	Sun	Mon	Tue	Wed	Thu
Email	Ataher8383@yahoo.com				2		

II. General information about the course:

1.	Course Title :	Quality Assurance In Radiology				
2.	Course Code and Number:	BMI312				
3.	Credit Hours :	Credit Hours				Total
		Theoretical	Seminar/Tutorial/Practical	Training		
		2	1		3	
4.	Study Level and Semester:	3 rd level/1 st semester				
5.	Pre-requisites :	None				
6.	Co-requisites:	None				
7.	Program in which the course is offered:	Bachelor in Radiologic Technology and Medical Imaging				
8.	Teaching Language:	English				
9.	Instruction location:	University of Science and Technology, Sana'a, Yemen				

III. Course Description

This course provides student with the fundamentals of quality assurance in radiography and medical imaging using various radiologic modalities. The contents of this course is designed to cover all radiology applications and equipment maintenance procedures to assure consistency in the contrast, density/brightness, sharpness of medical images, and to ensure that radiographic equipment perform according to manufacture standards. The course topics will focus on: quality assurance concepts, quality control procedures, and quality management principles and procedures, quality control tests in radiography, and quality control tests in medical imaging modalities (Computed Tomography Physical principles, Nuclear Medicine physics and its applications, Ultrasound and Magnetic Resonance

عميد الكلية:

د. عبدالله المخلافي

رئيس القسم:

د. عبدالحييب الفياطي

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المراجع :

د. اسماعيل الشرعبي

الموصف :

د. عبد الله طاهر

Imaging). The course carried out using: lectures, self-learning, seminar, applied research, discussion, Brainstorming session, Miniature education, Solve problems, and other activities to teach this course. Evaluation via periodic oral, written presentations, reports, and final written exam.

IV. Course Aims: This course aims to:-

1. Demonstrate the basic knowledge of quality assurance and quality control in diagnostic radiology technology.
2. Learn to apply various Quality control and quality management concepts related to radiography and medical imaging problems.
3. Investigate the effect of radiologic parameters on the quality of medical image.
4. Expand students' knowledge with radiologic applications (Radiography, computed tomography, Magnetic resonance imaging scanners, ultrasound imaging, and Nuclear medicine imaging applications such as Gamma camera, Single-Photon Emission Computed Tomography, Positron Emission Tomography, and nuclear medicine therapy systems).

V. Course Intended Learning Outcomes (CILOs): At the end of this course study the students will able to:-

1. Identify the fundamentals of radiography and medical imaging procedures to produce accurate medical images.
2. Develop understanding of QA aspects in medical image production using medical imaging instrumentations (X-ray units, computed tomography, Magnetic resonance imaging scanners, ultrasound imaging, and Nuclear medicine imaging applications such as Gamma camera, Single-Photon Emission Computed Tomography, and Positron Emission Tomography).
3. Interpret the relations between radiologic parameters and medical image quality using physical laws.
4. Analyze the relevant data collected during imaging procedures to produce good quality image.
5. Implement the procedures of the imaging examinations accurately, safely and sensitively.
6. Apply the physical theories solutions during medical imaging procedures to enhance image quality.
7. Prepare appropriate environment for patient, relatives and staff using the appropriate technique and procedures.
8. Manage of self -time and tasks regarding doing assignments about the course materials in a team.
9. Prepare the literature review for reports using library and internet.



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المراجع :
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VI. Course Contents

Theoretical Aspect:

No.	Course Topics/Units	Sub-topics	No. of Weeks	Contact Hours
1	Ch. 1 Introduction to Quality Assurance	<ul style="list-style-type: none"> - Quality assurance concepts - Quality assurance program - Quality control procedures - Quality management procedures. - Outline of a QA. - QA records 	1 st , 2 nd	4
2	Ch. 2 Quality control in Radiography	Dark room Q.A -Information analysis Dark Room QC -Dark room characteristic and environment. Leakage tests -Dark room lightening (over head light& safe light). -Light and leakage testing Film and chemical storage. Image display processing: -Viewing Box -Processors Quality control -Chemical activity (solution temp, processing time, replenishment rate). Image Processors Q.A -Processor cleaning procedures -Processor maintenance -Processor monitoring Exposure factors policy: -Control chart -Radiographic equipment quality control -X-ray generator X-ray machine Q.A: <ul style="list-style-type: none"> - Visual inspection - Environmental inspection - Performance testing. 	3 rd , 4 th , 5 th , 6 th	8
3	Midterm exam		7 th	2
4	Ch. 3 Ancillary x-ray and CT Machine Quality Assurance	-Radiographic ancillary equipment quality control. -Automatic exposures control testing. -Conventional tomographic system testing. -Fluoroscopic Q.A -Fluoroscopic equipment quality control. -Visual inspection -Environmental inspection Mammography Q.A -Performance testing care -Mammographic quality standard control -Mammography QA -CT scan QA	8 th , 9 th , 10 th	6
5	Ch. 4 M.R.I Quality Assurance	-Acceptance testing Routine testing	11 th	2

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المراجع :

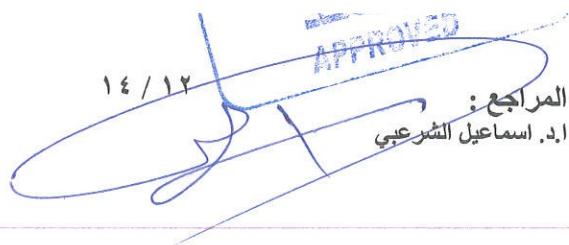
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		- MRI quality control		
6	Ch. 5 Nuclear Medicine QA	-Gamma Camera QA. -Single Photon Emission Computed Tomography QA. -Positron Emission Tomography QA. -Brachytherapy QA	12 th , 13 th	4
7	Ch. 6 Ultrasound QA	-Acceptance testing Routine testing -US quality control	14 th	2
8	Ch. 7 Primary and secondary factors of Q.A	-Phantoms - Primary quality factors. - Secondary quality factors.	15 th	2
9	Final exam		16 th	2
Total number of weeks and hours			16	32

Second: Practical/Tutorial/Clinical Aspects :

No.	Practical/Tutorial/Clinical topics	Week due	Contact Hours
1	Report about quality assurance in radiology concepts.	2 nd	2
2	Radiation Leakage tests	3 rd	2
3	Image Processors Quality	4 th	2
4	Automatic exposures control testing	5 th	2
5	Fluoroscopic visual inspection.	6 th	2
6	CT scan quality control	7 th	2
7	MRI quality control	8 th	2
8	Ultrasound quality control	9 th	2
9	Final practical exam	10 th	2
Total number of weeks and hours		9	18

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