

Course Syllabus

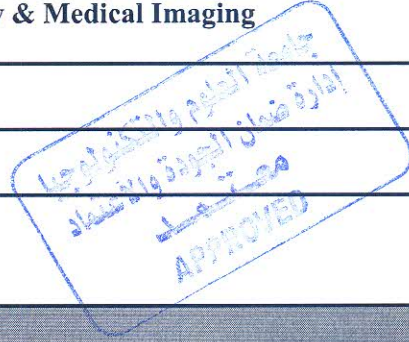
Faculty: Faculty of Medicine and Health Sciences

Department: Health Sciences

Program: Radiologic Technology & Medical Imaging

I. General information about the course instructor :							
Name	Dr. Abdullah Taher	Office Hours(3 Hours Weekly)					
Location & phone number	UST- 715989708	Sat	Sun	Mon	Tue	Wed	Thu
Email	Ataher8383@yahoo.com						

II. General information about the course:					
1. Course Title :	Radiation Physics (I)				
2. Course Code and Number :	BMI122				
3. Credit Hours :	Credit Hours				Total
	Theoretical	Seminar/Tutorial	Practical	Training	
	2		1		3
4. Study Level and Semester:	1 st level, 2 nd semester				
5. Pre-requisites (if any):	General Physics				
6. Co-requisites (if any):	-				
7. Program in which the course is offered:	Radiologic Technology & Medical Imaging				
8. Teaching Language:	English				
9. Instruction location:	UST- Sana'a				



I. Course Description
This course provides student with the Introduction to Radiation physics principles and its applications in medical imaging and radiation therapy. Topics will cover and focus on: Radiation, Ionizing Radiation, Radiation Safety & Dosimetry, X-ray physics, X-ray production, Radiography, Mammography, Computed Tomography, Radiation exposure, Radiotherapy. The course carried out using lectures, self-learning,

الموصف :
د. عبدالله طاهر

المراجع :
إ.د. إسماعيل الشرعبي

رئيس القسم:
د. عبد الحبيب ردمان

عميد الكلية:
د. عبدالله المخلافي

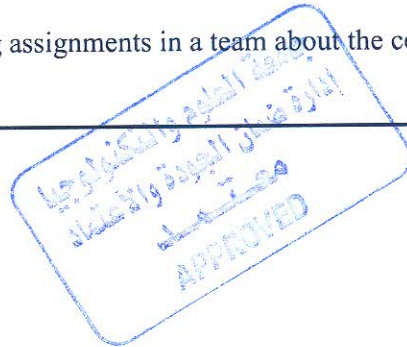
seminar, applied research, discussion, Brainstorming session, Solve problems, and other activities to teach this course. Evaluation via periodic oral, written presentations, a final written and poster report. The prerequisite of this course is General Physics.

II. Course Aims:

1. Develop basic understanding of Radiation physics and medical physics concepts.
2. Learn to integrate and apply various physics concepts related to medical imaging problems.
3. Expand student knowledge with medical diagnostic physics and radiotherapy.
4. Extend students' knowledge with Radiation physics applications such as X-ray units, Mammography, Computed Tomography, and Medical Radiation Instrumentation Physics.

III. Course Intended Learning Outcomes (CILOs) :

1. Describe the medical radiation properties, radiation sources, ionizing radiation, radiation safety, radioactivity, radiotherapy
2. Develop understanding of physical aspects related to medical radiation instrumentations and its components, as well as the physical principles, for each radiographic imaging modalities covered (X-ray machine, fluoroscopy, Mammography, Computed tomography, Dosimeters, imaging detectors).
3. Interpret the relations between the affecting factors on the medical radiation instrumentations which control its behaviour by using physical laws and mathematical equations
4. Gain experience from applying theories solutions in radiation dosimetry, radiation safety, medical imaging, and image quality.
5. Research and rewrite literature review using library and internet.
6. Manage of self time and task regarding doing assignments in a team about the course materials.



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27/5/2018

IV. Course Contents

Theoretical Aspect:

No.	Course Units	Sub-topics	No. of Weeks	Contact Hours
1	Ch. 1 Introduction	<ul style="list-style-type: none"> - Introduction to the Course - Principle of Radiation Physics - Matter and Radiation - Electromagnetic Wave Characteristics 	2	4
2	Ch. 2 X-ray physics	<ul style="list-style-type: none"> - X-ray production - X-ray photon interactions - X-ray photon attenuation. - The X-ray Imaging System. 	2	4
3	Ch. 3 Radiography	<ul style="list-style-type: none"> - Concepts of Radiographic - X-ray image production - Radiographic Projections - Screen-Film Radiography. - Digital Radiography - Image quality 	3	6
4	Ch. 4 Mammography	<ul style="list-style-type: none"> - Basis for Mammography - diagnostic mammograms - Mammography Film - digital mammography 	1	2
5	Ch. 5 Fluoroscopy	<ul style="list-style-type: none"> - Special Demands of Fluoroscopy - Image intensifier - Fluoroscopic Image Monitoring - Fluoroscopy Quality Control 	1	2
6	Ch. 6 Computed Tomography	<ul style="list-style-type: none"> - Principles of Operation - Generations of Computed Tomography - Imaging System Design - Image Characteristics - Computed Tomography - Quality Control 	2	4
7	Ch. 7 X-ray exposure	<ul style="list-style-type: none"> - Dosimetry - Safety - Dose Management - Radiation protection. 	1	2

إدارة شؤون الجودة والاعتماد
 وحدة ضمان الجودة والاعتماد
 APPROVED

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8	Ch. 8 Radiotherapy	<ul style="list-style-type: none"> - Radioactivity - Radiobiology of Tumours - Treatment Planning - Dose Evaluation of Treatment Plans - Biological Evaluation of Treatment Plans 	2	4
Total number of weeks and hours			14	28

Second: Practical/Tutorial/Clinical Aspects :			
Write up practical/tutorial/clinical topics			
No.	Practical/Tutorial/Clinical topics	Week due	Contact Hours
1	Report about the Production of the X-rays	2	2
2	Oral Presentation about Radiography.	4	2
3	Factors affecting on X-ray quality and quantity	6	2
4	X-ray image production	7	2
5	X-ray image quality factors	9	2
6	Report about advanced X-ray imaging	11	2
7	Model radiation therapy for the cancer Deliver Micro-assignment	13	2
8	Control of Scatter Radiation	15	2
Total number of weeks and hours		8	16

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