



Jordan University of Science and Technology
Faculty of Applied Medical Sciences
Department of Allied Medical Sciences Course
Syllabus second semester (2013/2014)

Course Information	
Course Title	Image Production and Recording Techniques
Course code	RA 214
Prerequisites	RA 210 or co requisite
Credit hours	2 (Theory) 1 (Lab)
Lecture location	
Instructor	Mustafa Alhasan
Office Location	Faculty of Applied Medical Sciences, office no. 1
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Office Hours	
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Teaching Assistant	Hamzeh Almasri
Course Description	
This course introduces the student to the radiologic technology science and explains the process of image formation including radiographic film structure, latent image formation, and processing of the x-ray film. In addition, it describes the factors which affect and image quality.	

Text Book	
Title	Radiologic Science for Technologists.
Author(s)	Bushong S.
Publisher	Mosby
Year	2008
Edition	9
Book Website	NA
References	NA
Additional material	
Title	LXi tutorials on medical X-ray imaging physics
Author(s)	Cowen A.
Publisher	University of Leeds
Year	2001
Edition	NA
Book Website	NA
References	NA

Assessment Policy		
Assessment Type	Expected Due Date	Percentage
First Exam		20%
Second Exam		20%
Lab	TBA	20%
Final Exam	TBA	40% (13%practical+27% theory)

Course Objectives	Percentage
1. Identify the basic parts of the x-ray tube	10%
2. Describe the process of x-ray production	10%
3. Identify the types of x-ray interaction with matter	10%
4. Describe the effect of scattered radiation	10%
5. Identify the methods of reducing the effect of scattered radiation	10%
6. Describe the structure of x-ray film, intensify screen and the process of image formation	15%
7. Describe the steps of image processing	15%
8. Understand all factors which affect the production of high quality radiograph.	20%

Teaching & Learning Methods

Lectures, visual demonstrations, group work, and personal contact

Learning Outcomes: Upon successful completion of this course, students will be able to

Related Objective(s)	Outcomes	Reference(s)
1	Mention the basic parts of the x-ray tube	Chapter 7
2	Mention and describe the interactions which result in the production of x-ray types of x-ray interaction with matter	Chapter 8, 9
3	Identify the properties of x-ray	Chapter 10
4	Recognize the consequences of scattered radiation	Chapter 9-11
5	Know how to limit the production and the manifestations of scattered radiation	Chapter 9-11, tutorial 2
6	Identify the different components of film and screen and their function	Chapter 13, 15, tutorial 3
7	Describe the steps of image processing	Chapter 14, tutorial 3
8	Identify the factors which affect the image quality	Chapter 7-16, tutorial 2-4

Course Content

Week	Topics	Chapter in Text (handouts)
1	X-ray tube construction. Electron target interaction X-ray emission spectrum Factors affecting x-ray emission spectrum	Chapter 2
2	X-ray interaction with matter Five basic interactions Differential absorption Contrast examinations	Chapter 3

3		Exponential attenuation X-ray quantity X-ray quality	Chapter 4
4		Production of scatter radiation Control of scatter radiation Characteristics of grid construction	Chapter 5
5		Measuring grid performance Types of grids Use of grids	Chapter 6
6		First exam	
7		Grid selection Film construction Formation of latent image	Chapter 7
8		Types of film Handling and storage of films Processing the latent image	Chapter 8
9		Processing chemistry Automatic processing Quality assurance	Chapter 9
10		Second exam	
11		Artifacts Intensify screens Screen construction Luminescence	Chapter 10
12		Screen characteristics Screen-film combination Care of screens Fluoroscopic screens	Handouts
13		Radiographic quality Film factors Geometric factors	Handouts
14		Subject factors Clinical considerations for improved radiographic quality	Handouts
15		Review	
16		Final exams period	

Lab Content		
Week		Topics
1		X-ray tube construction. x-ray room design.
2		Anode heel effect.
3		First exam.
4		Tube warm-up procedures. Combination of KVP and MAS.
5		AL filtration.
6		Effect of exposure factors (KVP&MAS) on film.
7		KV effect mass density.
8		Second exam.
9		Radiographic film component.
10		Intensifying screen.
11		Uses of grids.
12		The dark room. Processor.
13		Processes of developing.
14		Review
15		Final exams period