



The Hashemite University
Faculty of Allied Health Sciences
Department of Medical Imaging
Course Syllabus

Course information	
Course Title	Radiographic image Processing and Exposure
Course Code	140508212
Prerequisites	140508111 or Concurrent
Credit Hours	3 (2+3)

Course Description
<p>Radiographic Film is the major tool for displaying the X-Ray radiographic information. Therefore, the course starts by revising X-Ray Tube and moves to explain the required tools (i.e. collimator, filter, grid) before the X-ray beam hits the radiographic film. Later, the course explains in details the structure of the radiographic film and how the X-Ray radiation are transformed to silver depositions (i.e. the formation of the latent image). The course concentrates on how the latent image is "processed" to form the visible radiographic shades (i.e. final radiographic film).The "processing" procedures and the necessarily chemical components are explained in details. This covers both the manual and automated "processing".</p> <p>Then, the course explains the main characteristics of the radiographic film such as the optical density, film contrast, film gamma, and the film Latitude. These parameters are of great importance since they determine both "how to use film optimally" and "what the required imaging factors are" The understanding of these parameters controls the quality of the resulting radiographic film.</p> <p>Both the departmental Lab and the university radiography clinic give practical demonstration to the theoretical parts of this course.</p>

Course Objectives
<p style="text-align: center;">By the end of this course, the student is expected to:</p> <p>By the end of the course, the student will learn theoretically and practically how to optimize the film characteristics, the exposure factors, and the "processing" factors in order to get the best film radiograph for the patient. The patient factors are also introduced (e.g. patient thickness, organs alignments, and organs superposition).</p> <p>In summary, the course will complete the scope of diagnostic radiology course by explaining all the required tools necessary to obtain high quality radiographic films from planner X-Ray Imaging systems (Conventional Radiographs, Mammography, Fluoroscopy, Dent-graph)</p>

Recommended Textbook
Radiologic Science for Technologists, Physics, Biology, and Protection. By: Stewart C, Bushong, 9th Ed., 2008. Published By: Mosby, Elsevier.

Other References
The essential physics of Medical Imaging. By: Bushong J., Seibert J., Leidholdt E., and Boone J. 3rd Ed., 2012. Published By LWW

Course Contents
<p>Revision X-RAY TUBE</p> <ul style="list-style-type: none">• X-ray tube construction, X-Ray generation, and X-ray emission spectrum• X-Ray interactions with Matter, X-Ray Attenuation (Linear and Mass Attenuation Coefficient)

FILTERS and BEAM RESTRICTING DEVICES

- Control Of Scatter Radiation
- Aperture Diaphragm
- Variable, Aperture Collimator

The Grid

- Grid Characteristics:
- Grid Ratio
- Grid Frequency.
- Grid Strip
- Contrast Improvement Factor
- Bucky Factor Or Grid Factor

RADIOGRAPHIC FILM

- Remnant Radiation
- Film Construction
- Formation of The Latent Image
- Processing of the Latent Image
- Types Of Film
- Handling And Storage Of Film

INTENSIFYING SCREEN

- Screen Construction
- Luminescence
- Screen Characteristics

IMAGE QUALITY

- Radiographic quality
- Film factors
- Geometric factors

Mammography

Conventional Fluoroscopy

Dent-graph

Assessment	
First Exam	20
Second Exam	20
Final Exam	40
Lab + In course assessment	20