RADILOGIC SCIENCES DEPARTMENT

(Diagnostic Radiography)

TITLE : Radiologic Imaging & Processing II
NUMBER : 357
SEMESTER / YEAR : 2/3
CREDITS : 3 (2-3-3)
PRE-REQUISITE(S) : 356 Radiologic Imaging & Processing I
                    354 Imaging Procedures I
CO-REQUISITE(S) : 362 Imaging Procedures II
Coordinator/ Co-teachers : Dr. Mohsen Dashti/ Dr. E. Alqattan & Dr. M. Boushehri
Office Hrs : Sun 1-2, Wed 1-2, Thur 1-2
Contact Details : drmohsen.dashti@gmail.com
Website : http://mdashti.wordpress.com

I. Course Description

Components and controls in x-ray circuits. X-ray generators and exposure timers. Operation, care and testing of conventional, mobile and specialized x-ray equipments e.g. serial radiography, mammography, fluoroscopy, CT. Usage of radiographic technique charts and automatic-exposure techniques.

II. Course Objectives

At the end of the course the student will be able to:

1. Describe electromagnetic induction and state Faraday’s and Lenz’s laws.

2. Describe construction and operation of transformers (step-up, step-down, auto-transformers), and define power rating.

3. Describe kVp and mA circuits, and explain the process of wave rectification.

4. Describe single-phase, triple-phase, high-frequency, constant-potential, capacitor-discharge, and battery-powered x-ray generators, and underline their advantages and disadvantages.

5. Describe various types of exposure timers, and induction motors (rotors & stators).
6. Describe various types of x-ray systems (conventional, mobile, C-arm) including x-ray consoles, tables, grids, tube stands, and wall units.

7. Describe various types of grids, define grid parameters, and recognize and correct grid cut-off artifacts.

8. Select the appropriate diagnostic x-ray equipment for a certain radiographic procedure and operate it efficiently to produce the required radiograph.

9. Describe, construct and use various types of radiographic technique charts, and use various anatomical programmers.

10. Describe various types of automatic exposure control (AEC) devices, explain their function, and use them correctly in terms of proper sensor, density, kVp and back-up time selections.

11. Describe and use the air-gap technique, define magnification factor, perform magnification radiography, and appreciate their effect on patient dose.

12. Describe and operate dedicated mammography (including stereo-tactic breast biopsy) units, use dedicated films and specify film processing requirements.

13. Describe serial radiography and dedicated angiography systems.


15. Recognize x-ray equipment malfunctions and take the necessary action to prevent damage.

16. Describe and operate a computed radiography unit.

17. Describe and operate a computed tomography unit (conventional & spiral).

III. Course Content

1. X-ray circuits.
2. X-ray systems (conventional, mobile, C-arm) & room layouts.
3. X-ray technique charts & AEC devices.
4. Magnification radiography.
5. Film-screen mammography.
7. Fluoroscopy (analog & digital).
IV. **Evaluation Procedure**

1. Assignments 20%
2. Mid-Term Exam 30%
3. Final Exam 50%

-----
Total 100%

V. **Textbooks**


**Further reading**

*Chesney’s Equipment for Student Radiographers.* Carter, P. et al. 1994


