

Course Plan

Semester : 1	Academic Year: 1405-1404
Level: MSc	Major: M.Sc. in Medical Imaging Technology
Course Title: Physics of Diagnostic Radiology	Department: Medical Physics
Course Code:	University Professor or Faculty member: Dr. Ali Chaparian
Class NO:	Credit Hours: 34
Prerequisite: Basic Radiation Physics	Credit Units: 2 Credits (Theory)
Availability of Professor: Professor Ali Chaparian	Tel: 03137929211
Office Address:	E-mail: ali_chaparian@yahoo.com
Name of Student Representative and Cellphone Number:	Number of Students : 4

The General Purpose of the Lesson:

Learning Outcomes (Objectives): The overall objective of this course is to provide graduate students with advanced knowledge of diagnostic radiology physics and its clinical applications in medical imaging.

Assessment Methods:

(The Assessment Methods that will be Used to Test Students Learning outcomes & the Skills & Competencies Stated in learning Outcomes)

Assessment	Score From 20
Assignments and Homework	3
Quizzes	2
Midterm Examination	6
Final Examination	9
Total Marks	20

Main References (Text Books):

1. Bushberg's The Essential Physics of Medical Imaging, Bushberg JT, Seibert JA, Leidholdt EM, Boone JM.

References for More Reading:

1. **International Atomic Energy Agency Human Health Series Reports on Diagnostic Radiology Physics.**
2. **American Association of Physicists in Medicine Reports on Diagnostic Imaging Physics and Quality Assurance.**
3. **European Federation of Organisations for Medical Physics Guidelines for Diagnostic Imaging Physics.**

Student's Responsibilities:

- Participate in diagnostic imaging programs.
- Contribute to radiation protection initiatives.
- Support optimization of imaging protocols in clinical practice.

Attendance Rules:

- Interactive lectures
- Multimedia presentations
- Case-based discussions
- Problem-solving sessions

Department's Attitudes :

This course provides a comprehensive understanding of the physical principles underlying diagnostic imaging systems.

Mid Exam Date:

Final Exam Date:

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NO of Session	Main Topic	Teacher's Name	Place & Time	Date	Method of Presentation
1	Introduction to Diagnostic Radiology Physics and Historical Development of X-rays	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
2	X-ray Production and X-ray Tube Design	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
3	x-ray Tubes	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
4	Power Ratings and Heat Loading and Cooling	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
5	Image Formation and Image Receptors	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
6	Film-Screen Radiography and Transition to Digital Imaging	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
7	Geometry of Projection Radiography	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
8	Scattered Radiation in Projection Radiographic Imaging	Dr. Ali Chaparian	Medical Physics Department		Online & Offline

9	X-ray Tube and Beam Filtration in Mammography	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
10	Compression, Scattered Radiation, and Magnification in Mammography	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
11	Screen-Film Cassettes and Film Processing in Mammography	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
12	Fluoroscopic Imaging Chain Components	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
13	Fluoroscopic Detector Systems	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
14	Automatic Exposure Rate Control and Fluoroscopy Modes	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
15	Artificial Intelligence and Emerging Technologies in Medical Imaging	Dr. Ali Chaparian	Medical Physics Department		Online & Offline
16	Review, Clinical Applications, and Student Presentations	Dr. Ali Chaparian	Medical Physics Department		Online & Offline