

# TABLE OF CONTENTS

Chapter No.	Title	Page No.
1	<b>X-Ray Imaging Systems</b>	<b>01-68</b>
	1.1 Introduction to X-Ray Imaging 1.2 X-Ray Production and Properties 1.3 Interaction of X-Rays with Matter 1.4 X-Ray Tubes and Generators 1.5 Image Intensifiers and Flat Panel Detectors 1.6 Digital Radiography 1.7 Fluoroscopy and Angiography 1.8 Mammography	
2	<b>Computed Tomography (CT)</b>	<b>69-93</b>
	2.1 Generations of CT Scanners 2.2 System Components 2.3 Image Acquisition Methods 2.4 Image Reconstruction Techniques 2.5 Spiral and Multi-Slice CT 2.6 3D Reconstruction Techniques 2.7 Common CT Artifacts and Corrections	
3	<b>Magnetic Resonance Imaging (MRI)</b>	<b>94-117</b>
	3.1 Principles of Nuclear Magnetic Resonance (NMR) 3.2 Relaxation Times 3.3 MRI Instrumentation 3.4 Image Formation and Contrast 3.5 MRI Pulse Sequences 3.6 Functional MRI (fMRI) 3.7 MRI Safety and Shielding	
4	<b>Nuclear Medicine Imaging</b>	<b>118-138</b>
	4.1 Radioactive Decay and Radiation Types 4.2 Radiopharmaceuticals 4.3 Gamma Camera Principles 4.4 PET and SPECT System Overview 4.5 Image Acquisition and Reconstruction 4.6 Functional Imaging in Cardiology and Oncology	

5	<b>Ultrasound Imaging</b>	<b>139-166</b>
	5.1 Principles and Physics of Ultrasound 5.2 Ultrasound Propagation in Biological Tissues 5.3 Acoustic Impedance 5.4 Ultrasound Transducers and Beam Formation 5.5 Ultrasound Imaging Modes 5.6 Doppler and Color Doppler Imaging 5.7 Clinical Applications of Ultrasound	
6	<b>Radiation Therapy &amp; Safety</b>	<b>167-190</b>
	6.1 Principles of Radiation Therapy 6.2 Teletherapy and Brachytherapy 6.3 Linear Accelerators (Linacs) 6.4 IMRT (Intensity-Modulated Radiation Therapy) and IGRT (Image-Guided Radiation Therapy) 6.5 Radiation Dose Measurement (Dosimetry) 6.6 Safety Protocols and Regulations 6.7 Patient and Operator Protection	