

# Contents

---

<i>Preface</i> .....	vii
<i>Acknowledgement</i> .....	ix

## **Unit 1: Foundations of Imaging and Artifacts**

1. Introduction .....	2
<i>Gaurav Mishra, Sarthak Das, Priyansh Sahu, Madhusudan Chatim</i>	
2. Fundamentals of Radiation and Biology .....	5
<i>Anurag Luharia, Suhas Tiwaskar, Ashish Uke, Gaurav Mishra</i>	
3. Principles of Imaging Techniques .....	18
<i>Suhas Tiwaskar, Shreya Naik, Anshul Sood, Anurag Luharia</i>	
4. Artifacts in Radiology .....	27
<i>Maruf Ahmed, Suhas Tiwaskar, Sandeep Chaudhary, Albert Paul</i>	
5. Clinical Relevance of Artifacts.....	32
<i>Ansh Grover, Gaurav Mishra, Aditya Shrivastava, Nisha Govindani</i>	

## **Unit 2: Radiodiagnostic Imaging: Techniques, Artifacts, and Solutions**

6. X-ray Imaging.....	38
<i>Nisha Govindani, Suhas Tiwaskar, Sarthak Das, Ansh Grover</i>	
7. Computed Tomography (CT) Principles, Components, and Artifacts.....	56
<i>Albert Paul, Sarthak Das, Krishna Mehare, Suhas Tiwaskar</i>	
8. Magnetic Resonance Imaging (MRI) .....	68
<i>Shreya Naik, Nisha Govindani, Anshul Sood, Amit Khandekar</i>	
9. Fluoroscopy .....	80
<i>Rutuja Ukride, Sarbari Saha, Suhas Tiwaskar, Maruf Ahmed</i>	
10. Mammography.....	89
<i>Maruf Ahmed, Monika Luharia, Nisha Govindani Gaurav Mishra</i>	
11. Ultrasonography .....	97
<i>Anshul Sood, , Sarthak Das, Aditya Shrivastava, Priyansh Sahu</i>	

**Unit 3: Radiotherapy Modalities and Artifacts**

12. Introduction to Radiotherapy..... 108  
*Shweta Dahake, Tejshree Telkhede, Shreya Naik, Maruf Ahmed, Anurag Luharia*
13. External Beam Radiation Therapy: Techniques, Planning, and Quality Assurance..... 110  
*Shweta Dahake, Neha Rahul Deep Dhadse, Anurag Luharia*
14. Brachytherapy..... 116  
*Gajendran N, Sarthak Das, Anurag Luharia, Krishna Mehare*

**Unit 4: Nuclear Medicine Imaging and Associated Artifacts**

15. Functional Imaging..... 120  
*Madhusudan Chatim, Suhas Tiwaskar, Neha Rahul, Shrikant Chaudhary*
16. SPECT Imaging..... 123  
*Nallapati Brahmaiah, Suhas Tiwaskar, Madhusudan Chatim, Gajendran N*
17. PET Imaging..... 131  
*Priyansh Sahu, Aditya Shrivastava, Neha Rahul, Nisha Govindani*

**Unit 5: Innovations in Imaging and Artifact Reduction Technologies**

18. Innovations and Future Perspectives in Radiology ..... 138  
*Sarthak Das, Aditya Shrivastava, Krishna Mehare ,Gaurav Mishra, Ansh Grover, Ashish Uke, Anurag Luharia*
- References*..... 160