MEDICAL PHYSICS
The International Journal of Medical Physics Research and Practice

Handbook of Radiotherapy Physics: Theory and Practice, 2nd Ed. edited by Philip Mayles, Alan E. Nahum, and J.C. Rosenwald. Boca Raton, FL: CRC Press, 2021. ISBN 9780367192075

Reviewed by Katelyn Hasse, PhD

DESCRIPTION

This is the 2nd edition of the Handbook of Radiotherapy Physics, which was originally published in 2007. The book is organized into 11 parts, each dealing with a self-contained subject area including but not limited to Fundamentals, Radiobiology, Equipment, Dose Measurement, Treatment Planning, Quality Assurance, Therapy with Unsealed Sources, and Radiation Protection. An additional part has been included at the end of Vol.2, which provides tables of physical constants and radiation interaction data.

PURPOSE

This textbook is meant to be a comprehensive handbook that covers theoretical and practical radiotherapy knowledge for both medical physics trainees and practicing medical physicists. It provides a good overview of theoretical knowledge along with a practical description of concepts.

AUDIENCE

In keeping with the original intent of the first edition, this book is intended primarily as a course book for physicists in training but could also act as a reference book for practicing radiation physicists. It is a useful supplement to classic radiotherapy textbooks; concepts are introduced very well and extensive references are provided if the readers require a more in-depth review. The editors and authors have wide-ranging medical physics experience across the UK, Europe, and U.S.

CONTENT / FEATURES

As previously mentioned, the book consists of 2 volumes that are subdivided into 11 parts. Each part contains approximately 3-5 chapters, with each chapter being about 20 pages long. Each part begins with an introduction by the editors and is subdivided into single or multiple author chapters. There is an extensive bibliography at the end of each part. The volume is very lengthy, with some repetition and unevenness of style, as expected with the number of authors. The organization is a bit unintuitive, but the very encompassing table of contents and index are a great resource to help navigate.
The text is very comprehensive, with sections covering classic topics in the field along with modern topics such as knowledge-based planning, artificial intelligence, and MR-guided linear accelerators. I especially appreciated the quality assurance (QA) part, which included chapters ranging from QA of treatment planning and treatment delivery to data communication with DICOM.

ASSESSMENT / COMPARISON

Overall, this is a well-written handbook. Due to the extensive changes in the field of medical physics since 2007, this is a necessary and thoughtful update. The editors did a great job of assembling a huge amount of information. Given the breadth and scope of this text, along with the extensive bibliography, this handbook would be a great resource, especially for trainees and early career physicists.

Book Reviewer Biography:

Katelyn Hasse, PhD, is an Assistant Professor and the Associate Director of the Physics Residency Program in the Department of Radiation Oncology, University of California, San Francisco. Her expertise and interests include education, functional imaging biomarkers, and optimizing clinical processes and efficiency.